Country Economic Report 2000:10

ZIMBABWE

Maize Markets in Zimbabwe

Dick Durevall
Ramos Mabugu

SWEDISH INTERNATIONAL DEVELOPMENT
COOPERATION AGENCY

This country economic report on Zimbabwe is part of a series of annual studies, which are undertaken by the departments of economics of three Swedish universities in collaboration with the regional departments of Sida, under an agreement with the Division for Policy and Socio-Economic Analysis. The purpose of these studies is to improve Sida's economic analysis and knowledge of the programme countries for Swedish development cooperation in order to enhance the effectiveness of programme as well as project support.

This report has been prepared by Dick Durevall, School of Economics and Commercial Law at Göteborgs University, Department of Economics and Ramos Mabugu, University of Zimbabwe, Department of Economics.

Mario Zejan
Chief Economist

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

Address: S-105 25 Stockholm, Sweden. Office: Sveavägen 20, Stockholm
Telephone: + 46 (0)8-698 50 00. Telefax: + 46 (0)8-20 88 64
Telegram: sida stockholm. Telex: 11450 sida sthlm. Postgiro: 1 56 34-9
ISBN 91-586-8933-8
ISSN 1404-031x

Maize Markets in Zimbabwe

Dick Durevall[1] and Ramos Mabugu[2]

1) School of Economics and Commercial Law at Göteborg University, Department of Economics, Box 640, 405 30, Gothenburg, Sweden

2) University of Zimbabwe, Department of Economics, P.O. Box MP 167, Mount Pleasant, Harare, Zimbabwe

EXECUTIVE SUMMARY

The purpose of this report has been to discuss several aspects of production and trade of maize and maize meal, with an emphasis on the effects of economic reforms implemented since the beginning of the 1990s. Initially, the reforms seemed to be a success, at least in the maize meal market, as declining marketing and processing costs offset the negative effects of the removal of subsidies. Nonetheless, macroeconomic shocks and currency crisis during 1997 laid open some of the weaknesses of the current system when maize meal prices, as well as several other basic food prices, rose rapidly. This led to riots, and a re-introduction of price controls on maize meal in the beginning of 1998. According to government the millers had exploited the current instability by colluding to raise prices by more than what was motivated by the increase in costs, partly with the purpose of creating political turmoil. Hence, the difficult process of liberalisation of the maize and maize meal markets has only begun, and there are a number of unsolved problems that the authorities will have to deal with during the coming years.

The main problem is the difficulty of ensuring a sufficient supply of maize at stable prices. There are two reasons for this. First, maize harvests are very sensitive to variations in rainfall, and weather-induced supply shocks are common. Second, maize is a low-value and bulky commodity, which makes transportation costs high. For Zimbabwe, a landlocked country surrounded by several countries with insufficient infrastructure, transportation costs are particularly high. As a consequence, domestic and import prices of maize usually differ a great deal. Thus, domestic maize production has central role in ensuring food security. Yet, since Independence per capita production of maize has declined; maize production in tonnes has been more or less constant while population has grown. The stagnation in maize production can be explained by two factors. First, there has been little expansion in the total area planted with maize. Second, overall there has been no growth in yield per hectare planted. Although there was a significant one-time increase in land productivity in the communal areas during the 1980s, it was more than offset by a reduction of maize production on commercial farms, and they have much higher output per hectare. Moreover, there are no signs of increased land productivity as a result of the agricultural reforms. Maize production thus differs from tobacco where productivity seems to have been ring continuously since the 1970s.

The main explanation for the slow growth in area planted is probably sluggish development of maize prices relative to prices of inputs, other crops and consumer goods. Therefore, maintaining low producer prices for maize by government intervention is likely to affect supply negatively. Another factor that seems to have influenced planting of maize negatively during the 1980s is policy measures aiming at increasing agricultural diversification. Apart from these factors, the speed of implementation of land reform is also likely to affect the size of the area under maize cultivation. The reason is that smallholders use relatively large areas of land for maize cultivation compared to commercial farmers. Land reform has been slow since the mid-1980s however, and although government has attempted to speed it up recently in connection with the general elections in June 2000, the final outcome of this initiative is uncertain. In any case, the prospects for a rapid, but transparent, re-distribution of land that leads to an increase in total maize production are not very good.

The explanations for the lack of productivity growth are not as straight forward. In the short run, weather conditions account for almost all variations in land productivity. For smallholders, the empirical evidence also indicates that the number of depots and collection points are important. There is also evidence that the adoption of hybrid maize, and improvements in infrastructure, extension services, and availability of credit raised the level of productivity in the communal areas in the 1980s. The current problem is how to raise productivity even more in communal areas; yield per hectare in large-scale commercial farming is already high by international standards and increasing it might require large investments. Since it is well known that productivity in smallholder agriculture can be boosted by intensified input use combined with access to credit and output markets, that is what policies should aim for. Currently there is thus a policy discrepancy because government controls on maize prices keep them low while decontrolled input prices are allowed to rise. This is particularly a problem in an inflationary environment where most of the input prices are closely linked to import costs. Rapid inflation sooner or later generates large devaluations that, in turn, lead to increases in prices of fertilisers and other inputs. Since it is unlikely that maize prices are allowed to rise by the same amount, the result is declining use of inputs.

Since people consume maize meal, not unprocessed maize, it is important that the maize meal market functions well. The rapid increase in maize-meal prices during 1997 created suspicion that this might not be the case, and as a consequence government re-introduced price controls. The question is thus if there is sufficient competition in the maize meal sector. In our analysis we found that millers probably have little direct influence over the price of super-refined maize meal (polenta). This is surprising since there are only three producers in Zimbabwe. However, consumers consider roller meal, which is less refined and cheaper to produce, a close substitute to super-refined meal. Therefore, if producers raise the price of super-refined meal too much, demand drops quickly.

It is more difficult to obtain an idea of the degree of competition in the market for roller meal. The fact that there are many producers, three big milling companies and several hundreds small scale mills, and a close substitute to roller meal, the hammer-milled whole maize meal that can be produced at a cost of about 2/3 of roller meal, indicates that firms have little market power. Nevertheless, large millers do seem to be able to charge higher prices than the small ones. This could be due to collusion in combination with a segmented market where the large mills dominate certain urban areas completely. Indirect support for this a claim is the fact that average consumer prices have been lower than wholesale prices charged by the big millers for extended periods of time in some local markets, such as Gwanda in Matabeleland. It is of course also possible that large millers are able to charge high prices because of branding, that is, consumers are willing to pay more for their products because they think it is of better quality. However, maize meal is a homogeneous product and there should be limits to the importance of a strong brand name, particularly in a society with many low-income earners.

Hammer meal is the nearest substitute to roller meal for many consumers. However, in practice it might be difficult to substitute one for the other for those living in urban areas because of limited availability. To obtain hammer meal you must first buy the maize grain and then bring it to the hammer mill. This is time consuming and it could

easily take half a day. And since hammer meal only stays fresh for about four to five days, the procedure has to be repeated every week. In any case, there is no doubt there is competition in the production of hammer meal. The start-up costs are low and usually it is sufficient with one person to do the milling. When the market regulations were removed in 1994 both production and consumption of hammer meal increased significantly, and currently it makes up about half of all maize meal consumed in Zimbabwe. Paucity of data makes it difficult to get any hard facts on recent developments in the industry, however.

When price controls were re-introduced in 1998, the maize meal market was going through a rapid process of structural change. Several new small-scale mills had appeared since the start of the reform in 1994 and the big mills had lost large parts of their market shares. Hence, even though millers might be colluding to maintain high prices, it is certain that the emerging mills were increasing the amount of competition in the market. After all, roller meal is quite easy to produce. One consequence the price controls was a reduction in profits, and many mills were forced to stop production, at least temporarily. Government intervention thus increased the risk of investing in milling, and this probably benefited the large milling companies because they have more financial resources than the small ones. Therefore, it is likely that price controls have slowed down, or maybe even stopped, the change towards a more competition in the maize meal market. Controlling prices might be justifiable as a short-run solution, i.e., for a couple of months, to a political problem such as riots. But when controls of some prices are maintained for a year or two in an economy where otherwise most prices are market determined, the cost is high because of misallocation of resources. It is therefore better to adopt a policy that aims at ensuring there is competition in the maize meal market by removing barriers to entry, than controlling prices. Here the newly established Industry and Trade Competition Commission, set up in 1998 as part of the original structural adjustment programme (ESAP), could play an important role. In any case, it is clear that further analysis is necessary before any definitive statements about competition in the maize meal market can be made.

Another issue is the distributional impact of controlling maize prices. Our analysis suggests that if maize meal pricing policy is going to be used as a means to "redistribute income", roller meal is probably not the best food medium. First, increased roller meal prices are likely to hurt the non-poor more than increases of straight run meal prices. Second, the non-poor consume more refined meal than the poor do in absolute terms, so the subsidy on maize meal benefits them. Better targeting can be achieved directly through a social assistance program using vouchers, targeted cash payments to the poor, in-kind transfers, etc. Whatever the approach, the choice should be based on the current social assistance system and on future social assistance policies, and should be coordinated with food sector objectives.

In Zimbabwe, the Grain Marketing Board (GMB) has a monopoly on exports and imports and the responsibility to ensure that there is an adequate supply of maize in the local market. In effect, external trade in maize and maize meal has not been liberalised. The official strategy is that the GMB should keep at least 500 000 tonnes of maize in depots as a buffer stock, which is equivalent to about four months domestic consumption. This is expected to keep expensive imports at a minimum level. However, data on international trade reveals that there were large imports of

maize during the 1990s. At the same time the (GMB) exported a significant part of the national crop; for example, 20% and 35% of total maize production were exported in 1997 and 1998, respectively. Considering that there was a shortage of maize in the domestic market during 1998 and that prices skyrocketed, the strategy of the GMB appears to be questionable. Indeed, Zimbabwean farmers seem be able to supply its population with sufficient amounts of maize during most years, and with buffer stocks the GMB should be able ensure a stable supply without recurring to expensive imports.

One of the inherent problems of the maize market is the combination of recurrent supply shocks and the large difference between domestic and foreign prices. This could lead to very volatile prices in a completely unregulated market. Since drought effects the external balance negatively, devaluations are likely to reinforce the volatility by pushing up import prices. Hence, there is a role for an agency that stabilises prices in one way or another. One approach that should be explored is to use a system where the agency aims at keeping changes in maize prices close to those of the consumer price index by intervening in the market. This means that it sells and buys maize to smooth out price changes. It would be preferable that the agency is independent of government, in the same way that central banks are in some developed countries. It should be recognised, though, that in contrast to central banks the agency would incur costs because of the need of keeping stocks and would most likely require government subsidies.

It is also worth exploring in detail the establishment of a regional market for white maize. Most countries in southern and eastern face problems that are similar to the ones of Zimbabwe, which are bound to constitute a significant welfare cost. Regional integration of the various maize markets would smooth out fluctuations in supply during most years. The reason is that the fluctuations in domestic production are mainly due to variations in rainfall and usually there are surpluses in some countries and deficits in others. Nonetheless, the possibility of drought in the whole region exists and some stock keeping would be necessary even with an well-integrated regional market.

1. INTRODUCTION

In the 1980s, the Zimbabwean government used price and wage controls to redistribute income. Price controls may be a good tool for redistribution if low-income households consume more of the low-priced good than high-income households do. This does not seem to be the case for Zimbabwe, at least in the domestic refined maize meal market. Hence, as part of the country's adjustment program, launched in 1991, the government was urged to correct public sector prices, and to use fiscal policies and targeted subsidies to achieve its distributional aims. Moreover, agricultural and food markets were to be liberalised, allowing market forces to determine prices and quantities. One result was that a critical problem facing many African governments was highlighted, the food-price dilemma: How do you keep food prices at tolerable levels for poor consumers when production incentives must be improved? Not surprisingly, since the start of the reforms food has become a major national issue. The riots that took place in 1998 and the subsequent re-introduction of price controls on essential food items are evidence of this.

The maize market is one of the most important markets in Zimbabwe. This is because most smallholders and many large-scale commercial farms cultivate maize, so variations in prices have a direct impact on incomes. It is also important because maize meal is the staple food, accounting for up to 40% of total expenditures among the poor (Jayne and Rubey 1993). There are several characteristics distinguishing maize meal consumption in Zimbabwe, which have a bearing on how economic reforms are affecting welfare. First, the urban residential sector consumes a large part of the relatively expensive refined maize meal produced by large-scale industrial mills (roller and super-refined meal). This is partly a result of government policy, which has favoured consumption of industrially refined meal over less refined hammer-milled flour. Second, middle and high-income consumers spend a larger share of their budget on industrially processed meal than low-income consumers do. Third, the extent of price controls and production subsidies that prevailed under the control regime prior to 1990/91, many of which continue to affect the economy, makes for an important qualitative difference as compared to most other sectors of the Zimbabwean economy.

The main purpose of this report is to analyse various aspects related to the interaction between policy, maize meal marketing, and production in the Zimbabwean maize sub-sector. Section 2 provides a background by briefly describing the "stylised facts" with respect to agricultural policies and performance before and after the introduction of the reforms programme. Section 3 analyses the evolution of domestic supply of maize grain since Independence. The main issues addressed are the determinants of the area planted and productivity in communal and commercial areas, respectively. Section 4 focuses on the domestic maize meal market. It contains a description of the structure of the maize meal market and an analysis of relative price changes for consumers, millers and maize grain producers during the deregulation of the market. Moreover, an attempt is made to evaluate whether the maize meal market should be characterised as a monopolistic market or if there is a reasonable amount of competition. Section 5 looks at food security by constructing indices that highlight the availability of maize meal at the macro-level. In Section 6 maize imports and exports are studied. The main question asked is whether international trade in maize, which is managed by the Grain Marketing Board, has helped

to stabilise prices and ensure an adequate domestic supply. Finally, Section 7 provides a summary and concluding remarks.

2. MAIZE POLICY AND SECTOR PERFORMANCE

One of the key elements of Zimbabwe's structural adjustment programme (ESAP) has been the reduction of the role of the state in agriculture in general. This section gives an overview of the elements of agricultural policies that pertain to the maize market before 1991 and the implementation of the liberalisation programme. Moreover, some of the welfare effects of the reforms are discussed.

2.1 Maize Policy before 1990/91[1]

Before economic reforms, agricultural policy was seen as a part of a strategy to consolidate the state's grip on the economy. It was mainly directed at intervention with the overall objective of self-sufficiency in food crops, low and stable food prices, and support for an equitable regional development. The maize sector was highly regulated with controlled consumer and producer prices.

Maize prices were set at the beginning of the crop season, in general at levels well below world market prices. To encourage equitable regional development, the pricing was on a pan-territorial basis. This was an attempt to support production in remote areas, but was done without due consideration for different ecological conditions as well as transportation costs. Further, to prevent supply and demand conditions to influence prices, maize output could only be sold through the Grain Marketing Board (GMB), a state owned board. It was prohibited to trade maize outside authorised channels, except for local trade. Maize could only be sold through one of three procurement arms of GMB: (a) GMB depots, (b) GMB collection points located in rural smallholder areas, and (c) licensed private traders that bought on behalf of GMB. Moreover, the GMB was obliged to buy all farmers' produce. The GMB absorbed all processing, handling and storage costs associated with the procurement; the maize was stored in depots, which were, and still are, owned by government. Hence, the system was highly centralised.

There were also explicit and implicit subsidies on agricultural inputs, such as fertiliser and maize seed, for most producers in the country in the form of price controls. In addition, the government, through the Agricultural Finance Corporation (AFC) and general control on interest rates, provided loans to farmers at subsidised interest rates.

As a result of government intervention in the maize market, millers could obtain maize at low prices. Therefore, consumer prices of industrially processed maize were controlled as well. This was partly for distributional reasons and partly to stop millers from charging too high prices, which would have been likely given that there were only four of them. Nonetheless, the millers appear to have been able to capture a significant share of the subsidies anyway (Rubey 1993).

Agricultural policy during the 1980s contributed to what has come to be known as the 'Zimbabwean Miracle' (see Eicher and Rukuni 1994; Mabeza-Chimeza 1998). The

[1] See Rukuni and Eicher (1994) for details on agricultural policy in the 1980s.

essence of this miracle was a dramatic increase in the share of total sales of communal farmers in the early 1980s. However, there has not been much growth since then, with the 1998 share of communal areas being the same that it was in 1984. Most of the growth in output was achieved by expansion of the area under maize and cotton cultivation; the area under maize in communal areas increased 1.34 times from 900,000 hectares in 1980 to 1,149,500 hectares in 1988. At the same time artificially low producer prices resulted in sizeable declines in the total surface area of land under maize cultivation. This was due to the response of the commercial farmers. Moreover, despite increased yields (which in part reflected artificially low input costs), the subsidisation policies were very costly to the government and they resulted in a large burden on government finances.

2.2 Liberalisation Policies

In the 1990s the government began to gradually relax its controls on the maize sector in line with policy developments elsewhere in the economy. Producers were now allowed to sell to whomever they wished (without restrictions) as long as it was within Zimbabwean boarders, essentially removing the single-channel marketing mechanism. Moreover, the AFC ceased provision of subsidised rural credit, and fertiliser and seed prices were decontrolled (World Bank 1995a).

It is important to note that despite all the reforms the government has not completely withdrawn from intervention in the maize sub-sector, presumably because of the perceived sensitivity of maize for both producers and consumers within the domestic economy. In order to avoid domestic food shortages, prohibition of maize exports, except by the GMB, are maintained. Although there are isolated instances when a private agent can be allowed to export maize, the government continues to manipulate foreign trade through restrictive licensing. As a result, domestic maize prices have remained at levels well below import parity prices.[2] The state also has considerable direct impact on domestic maize prices because of GMB's role as a 'buyer of last resort', that is, it is obliged to buy all maize offered for sale at the official price, and through maize purchases for the Strategic Grain Reserve[3].

An evaluation of maize reforms since 1991 is thus made complicated by the fact that the reforms are not yet complete, at least not in the sense that the relevant markets are fully deregulated. Furthermore, because numerous other reforms elsewhere in the economy are taking place simultaneously, one cannot be certain that all the effects in this sub-sector are attributable to maize reforms. The situation is also complicated by the severe droughts that occurred in 1992 and 1994-95. However, available anecdotal evidence allows some preliminary conclusions.

According to Muir-Leresche (1998), the first year of private trading following the good 1994 harvest resulted in maize producers being paid a little less than the GMB prices by private traders in communal areas. The 1995 harvest was poor and prices paid to

---

[2] Other factors that may contribute to differences between domestic prices for maize and import parity prices include the road system and lack of on-farm storage facilities that hamper access to markets. See Section 6 for details.

[3] The Strategic Grain Reserve idea was rekindled in the mid-1990s. Its main task is to build up and maintain a strategic maize reserve aimed at an increase in food security during periods of severe shortages. The scheme is funded through the budget.

producers were more than double those paid by the GMB. Although most surplus farmers appear to have benefited, some surplus farmers lost out. The producers negatively affected by decontrol and commercialisation are small, surplus farmers in remote areas. These areas have high transport and transaction costs with relatively few, scattered farmers producing small surpluses.

Some studies have shown that the three high rainfall provinces of Mashonaland West, East and Central, which include only 18 of the 170 communal areas, account for about 70% of maize in surplus years and up to 90% in drought years. In practical terms, this implies that as the producer prices of maize increased, only those communal farmers in surplus regions (18% of communal farmers) and commercial farmers could have benefited. Further, there are reports that in Mangwende communal area private traders were paying $45 per bag of maize as opposed to the GMB price of $56, and that farmers saw the liberalisation of maize prices and its marketing as leading to lower maize prices. Whether this is a transitional phenomenon due to information problems, or a result of market forces, is hard to tell.

On the demand side, the impact of liberalised grain marketing is still controversial. Some contend that the poor have benefited from cheaper maize-meal prices, cash payment, farm-gate collection and provision of packaging (Addison 1996). Indeed, the conditions prevailing before the reform were such that the rural poor had not been benefiting from the maize-meal subsidy because of poor access (Muir-Leresche 1998). However, this seemingly rosy picture is one side of the story.

Since economic reforms in 1991, food prices have shot up. Since the poor spend the bulk of their income on food (for the very poor food consumption is nearly 60 per cent of total consumption), a substantial increase in food prices is likely to worsen their economic situation. However, those of the poor who cultivate enough maize for their own consumption might escape some of the negative consequences. It thus seems as if liberalisation measures such as the reduction in food subsidies have affected many of the poor disproportionately, given the high income-share spent on food. Adjusting prices for maize meal upward under such circumstances of general hardship has understandably been difficult. Government has responded by putting price controls on maize meal prices that are formally milled.

2.3 Maize Consumption in Zimbabwe—Some Empirical Evidence

According to data from the 1995 Poverty Assessment Study Survey, denoted PASS, (MPSLSW 1996a), total consumption profiles show that maize meal was the most consumed commodity, accounting for the biggest share, 18.2%, of total consumption. Meat, rent and bread also had high budget shares, at 9.6, 8.8, and 8.6% respectively. A comparison with rural average household total consumption showed that there was an increased budget share for maize meal with reduced percentages for other items. This makes maize socially and politically important in the economy.

In the same PASS, an important finding was that refined maize consumed a larger portion of the budget of the non-poor than of the poor (see Table 2.1). While the very poor of the population spent 10% of their total expenditures on refined maize, the non-

poor spent 23%. So, not only did the better off spend a larger absolute amount on refined maize than the poor, they also consumed a larger proportion of their expenditures as refined maize. This suggests there is a positive and strong income elasticity of refined maize demand.

Table 2.1: Households by staple food and poverty category, 1995.

Staple Food	Very poor%	Poor%	Non-poor%	Total%	Total number
Maize (hammer)	59	16	25	100	11429
Maize (Refined)	22	18	60	100	6585
Sorghum	61	16	23	100	97
Millet	84	9	7	100	87
Rapoko	67	17	17	100	12
Other	9	2	89	100	291
Not stated	41	17	42	100	296
Total	45	16	39	100	18797

Source: 1995 Poverty Assessment Study Survey, Ministry of Public Service, Labour and Social Welfare, (PASS).

These consumption patterns indicate that substantial increases of maize meal prices will have a major impact on household maize meal expenditures. How hard is it for households to adjust their consumption to higher prices? There is little information on price elasticities for Zimbabwe, but a number of factors suggest that the elasticity of demand might be low in the short term, at least for low-income urban dwellers.

There are three types of effects on households associated with higher maize meal (roller meal) prices: First, there are the *direct* effects on the consumption and welfare of household consumers; these depend on the share of refined maize meal in total budgets and its substitutability with other foods and with other goods. These costs will be higher in the short run than in the long run. Second, the *indirect* effects resulting from higher revenues for millers/retailers that permit needed investments, allowing producers to become more efficient and to provide better quality maize meal, both of which benefit consumers. Moreover, it makes the market attractive for new millers, thereby increasing competition. And, third, are the macro impacts. These relate to the effects of higher prices (and reduced subsidies) on government expenditures and revenues.

2.4 Some Implications: Addressing the Social Consequences of Price Increases

To trace all the effects outlined above carefully and simultaneously requires the use of a computable general equilibrium model of the economy, which is beyond the scope of this paper. However, currently work is being done on this type of analysis, and some preliminary results are available (see Mabugu 1999). These can be used to help guide the government in determining who is affected most, and in determining the amount of compensation households would need, if governments were to decide to try and offset welfare losses or financial costs to households from maize meal price increases. The brief analysis that has been carried out so far suggests that if maize-meal pricing policy is going to be used as a means to "redistribute income", roller meal is probably not the best food

medium. First, the non-poor (rich) consume absolutely more refined meal than do the poor, so the subsidy on maize meal benefits them, and raising maize-meal prices would thus be progressive in its impact. Second, explicitly subsidising roller meal prices to help the poor raises the question of interfood substitution. If families can substitute away from other maize meals toward roller meal, this will have seriously distorting effects on the economy, for instance depressing demand for hammer meal which is cheaper to produce and more nutritious (see Section 4.2). Finally, continuing with price controls, as government has resolved to do, makes subsidies available to all. This implies a significant leakage to the non-poor that represent a major fiscal cost, although with the current set-up the cost is to a great extent reflected in the milling firms' accounts.

3. MAIZE PRODUCTION

The purpose of this section is to describe how the domestic supply of maize grain has evolved since Independence. A central issue addressed is what determines the amount of maize produced. We do this by relating changes in production to changes in area planted and land productivity. In addition, their respective determinants are discussed. Since one of the goals of ESAP was to generate growth through enhanced efficiency, it is also of interest to see how agricultural reforms have affected productivity. This is analysed using regression analysis, making it possible to control for the effects of some of the exogenous factors on productivity. In the following subsection we first discuss maize production at a national level, and then we look at the communal and commercial areas separately.

3.1 Production, Area Planted and Yields

To highlight long-run developments, Figure 3.1 shows total maize production in Zimbabwe over the period 1971 to 1999 summed over three-year periods. During the 1970s the total harvest varied between 1.5 to 1.7 million ton. At the time of Independence, production increased significantly. To some extent this was due to the termination of civil war, but it was also related to increased public investment in agriculture and land reform. The higher level of production seems to have been maintained into to the 1990, in particular if the unusually severe droughts in 1992 and 1995 are considered. However, there is clearly no visible long-run upward trend, implying that production has no kept up with population growth.

The relation between area planted and maize production is plotted in Fig. 3.2 for the period 1970 to 1999. It shows that the direct cause of the level shift was a rapid expansion of the area under maize cultivation in the beginning of the 1980. The expansion reached its peak in 1982, and was then followed by a decline that lasted for about ten years. In 1993 this decline was reversed, thus coinciding with the agricultural reforms. Then in 1998 there was once a gain a drop in area planted, partly because of widespread fears of drought due to el Niño and partly because of high input costs.

As evident from Fig 3.2, harvests vary considerably from year to year, and most of the variation is unrelated to the area planted. However, there is a visible change in the relation between output and area some time in the 1980s, indicating that there was a decline in land productivity. To show how land productivity has evolved, yield per hectare was calculated and graphed in Fig. 3.3. It has varied between values as high as 2100 kg/ha

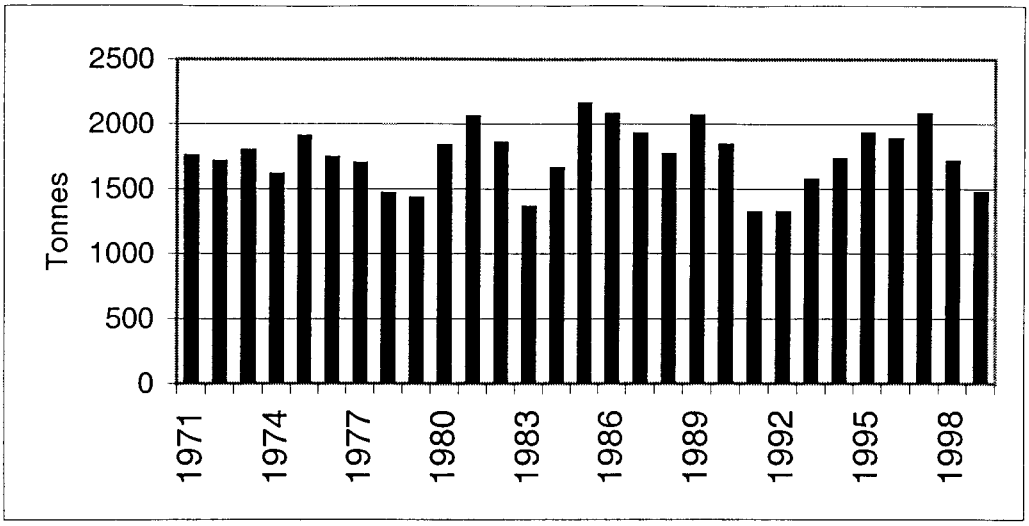

Figure 3.1. Three-year moving average of maize production. The observation for 1999 is the average of production for 1998 and 1999.

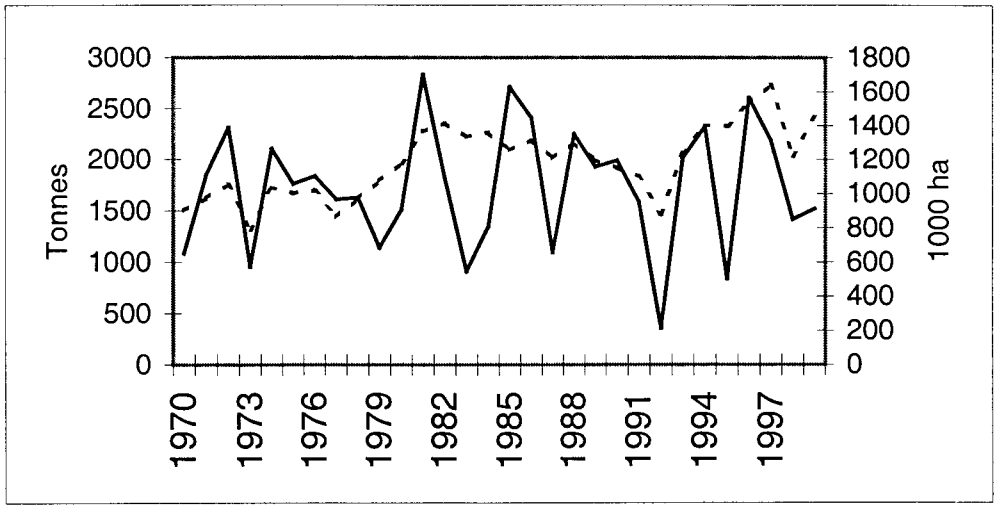

Figure 3.2. Maize production (—) and total area planted (····).

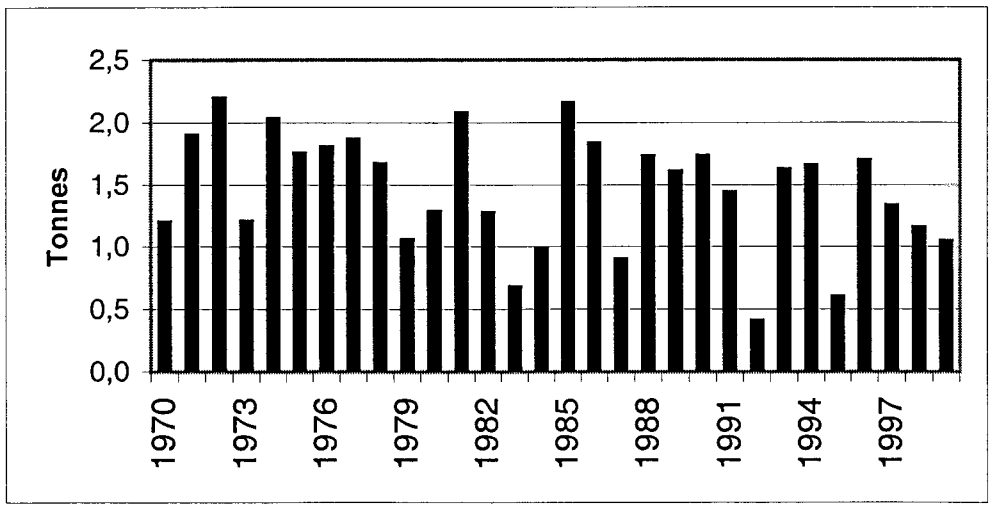

Figure 3.3. Maize production per hectare.

certain years to as low as 400 kg/ha other years, e.g. in 1992. Over time there has been a clearly discernible decline in land productivity, but whether this is due to a negative trend or a downward shift in productivity during the latter half of the 1980s, is not easy to see in the graph.

Since the aggregated data includes maize output from two very different production systems, large-scale commercial farming and smallholder farming, we have reported the three series for each sector in Figs. 3.4 – 3.7. As Fig 3.4 shows, during the 1980 commercial farms reduced the area planted rapidly. This was to some extent due to land reform, which contributed to a decrease in the number of commercial farms from about 6000 to 4500. Moreover, because the segmented marketing system during the 1970s favoured white farmers, it is likely that maize produced in the communal areas sometimes were sold by commercial farmers. This artificially increased their output. Fig 3.4 also shows that initially there was initially a rapid increase in area planted during the 1990s, but it turned out to be temporary. The overall impression is therefore that no permanent changes in areas planted have taken place since the mid-1980s.

One consequence of the decline in area planted was a similar decline in output. The implication of this is illustrated by Fig 3.5; since the beginning of the 1970s there have been no improvements in land productivity for maize in the commercial areas. Indeed, there appears to have been a slight decline instead, though this might be due to the reporting problem during the 1970 mentioned earlier. This development should be compared with tobacco production, where productivity has grown markedly since the 1970s (see Durevall et al. 1998).

Figs. 3.6 and 3.7 depict the evolution of the same variables in the communal areas. On average maize production and area planted rose significantly soon after Independence, which was part of the 'the Zimbabwean miracle' or 'the smallholder agricultural revolution'. These levels were more or less maintained until 1992, when there was a decline due to draught. The following years up to 1996/97, agricultural-market reform coincided with another increase in area planted, which was almost as big as the post-Independence one. This upward trend was, however, reversed in 1997/98. Another feature that Fig. 3.6 illustrates is the sharp increase in the volatility of output during the first half of the 1980s. To some extent this was due to variations in rainfall (see Fig. 3.14 below).

Fig. 3.7 reports the development of land productivity. In mid-1980s, average output per hectare rose from about 600kgs - 700kgs to more than 1000kgs. This increase has been attributed to the adoption of hybrid maize (Thirtle et. al. 1993), but it was probably also related to increases in public expenditures in agriculture. For instance, the best year ever was 1985, an election year when government invested heavily in winning votes in the rural areas. During the 1990s there was a slight decline in output per hectare, but we cannot say whether this was related to the agricultural market reforms or not without controlling for exogenous factors.

3.2 The Determinants of Maize Production

The sluggish growth in domestic maize production during the last three decades makes

it important to try to uncover its determinants. As a first step, one can divide changes in output into changes in area planted and in land productivity. The area planted should, to some extent, be related to the relative price of maize. Table 3.1 therefore reports real producer price indexes of a selection of crops (maize, peanuts, sunflower, wheat and tobacco). All the prices were deflated by the CPI and set to 100 in 1990. It is striking that since the beginning of the 1980s, the only crop that has a positive trend is tobacco. All the other crops seem to have stagnant or declining real prices.

Table 3.1 Indexes of Real Producer Prices for Selected Crops (1990=100)

Harvest year	Maize	Wheat	Peanuts	Sunflower	Tobacco
1981	128	110	101	117	63
1982	164	121	99	128	69
1983	133	113	86	120	77
1984	111	109	71	112	84
1985	119	114	110	116	93
1986	134	114	115	108	86
1987	119	117	102	110	79
1988	111	109	106	113	71
1989	106	107	94	106	96
1990	100	100	100	100	100
1991	85	93	81	93	118
1992	72	74	68	112	119
1993	114	111	64	130	97
1994	153	133	70	107	97
1995	125	108	107	89	79
1996	120	138	98	77	91
1997	116	109	83	59	110
1998	88	100	88	45	127
1999	104	60	-	43	-

Note: The real values were obtained by deflating the producer prices with the consumer price index. The sources for the data are the Grain Marketing Board and MOLA (March1999). The consumer price index for 1999 is preliminary and based on a yearly rate of inflation of 60%.

The behaviour of maize prices during the 1990s is of particular interest. Initially the real price declined by almost 30%, then from 1992 to 1994 it rose by more than 100%, reaching 153, and finally it returned to the level prevalent at the end of the 1980s. Real maize prices were thus very unstable during the period 1990-1999. To some extent this was due to the fact that nominal producer prices were set, or influenced, by government even after the deregulation of the domestic maize market was completed in 1994 (APAP III 1997). As often is the case with administratively set prices, the nominal maize price remained unchanged during long periods and was then raised abruptly. The volatility of real maize prices was also due to the increase in the volatility in consumer prices, which also worsened the effects of the long delays in adjusting maize prices.

Figs 3.8 and 3.9 show the relation between area planted and the real price of maize in commercial and communal areas. Real prices seem to matter in both areas; the series follow the same trend and most of the times when prices increase the area planted is expanded, and vice versa. The exception is the first half of the 1980s in the communal

areas, when area planted increased for other reasons. Policy thus appears to have had a large influence on maize production. Support for this conclusion is also given by Mashingaidze (1994) who argues that the downward trend in maize production in commercial farming observed during the 1980s was to due to the official policy of encouraging diversification into other crops, which included declining real producer prices.

For many farmers in communal areas the cost of fertilisers is a principal determinant of input costs; about 70% of their total expenditures for production are on fertilisers and pesticides (MOLA 1997). Changes in the cost of these are likely to have a strong impact on production. To evaluate the development of fertiliser prices, two indices were calculated. These were constructed by dividing the price of the fertiliser with the producer price of maize and the CPI, respectively, and set the value to 100 in 1990. Since the observed pattern was very similar for most fertilisers used in maize production, we have only reported the real prices of Compound D. As Fig. 3.10 shows, the real price is highly volatile, in particular in terms of maize prices. Since 1990 the index has gone from 100 up to 180, down to 70 and then up to 160. The fluctuations are somewhat smaller when the CPI is used as a deflator, but they are still substantial. Fig. 3.10 also shows that fertiliser prices in general have not been high, or increasing, since the start of ESAP, as sometimes claimed. Between 1991 and 1996 the real price, both in terms of CPI and producer prices, were as low, or lower, than during most years during the 1980s. However, in 1997 real prices increased to very high levels, creating concern for the possibility of a rapid decline in fertiliser use.

One reason for the large fluctuations in fertiliser prices is their close link with import prices. This is shown by Fig. 3.11 that plots the rate of change of fertiliser prices and the rate of devaluation. The tight price-exchange rate link is partly due to the fact that domestic fertiliser production is heavily dependent on imported inputs, which means devaluations have a strong impact on production costs (Chipika and Chisvo 1999). Moreover, it might also be due to the small number of domestic producers of fertilisers and limited amounts of import competition, i.e., changes in costs rapidly spill over into price increases. It has for instance been noted that fertiliser price changes are almost identical, which is interpreted as resulting from lack of competition (S. Tsikisayi, ZFU, in conversation).

Another factor that affects production is the amount of credit provided by the government owned Agricultural Finance Corporation (AFC). This is particularly the case for communal farmers since they usually do not have access to bank credit (World Bank 1995b). Since the AFC has been restructured as part of the public-sector reform, and recently has became a bank, subsidies to rural credit have declined and more stringent lending criteria are used. It is argued that this has led to a reduction in rural credit, and consequently, production (see Beyond ESAP 1996).

Two measures of credit, the number of loans and the real value of the credit provided by AFC to communal farmers, are shown in Fig 3.12 for the period 1980-1997, where, for instance, 1985 stands for April 1985 – March 1986. Both series grew rapidly from 1981 to around 1987, then they declined continuously until the beginning of the 1990s, when there was an expansion in value of the loans. Hence, although the supply of credit

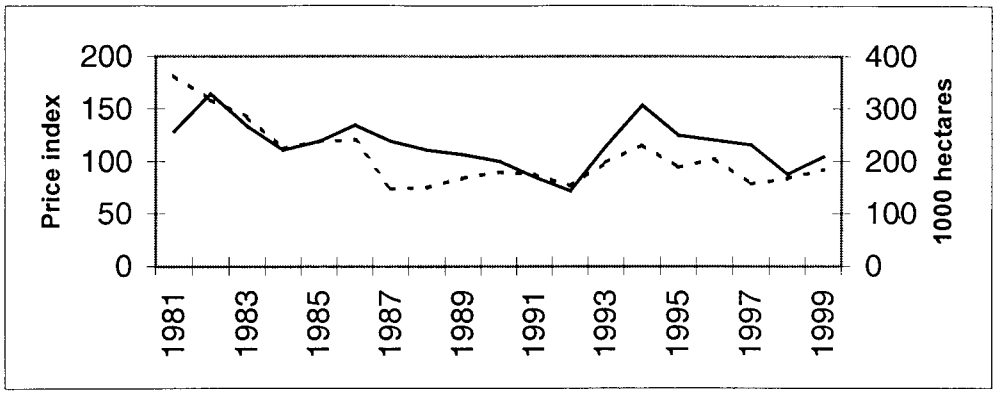

Figure 3.8. The real price of maize, 1990 =100 (—) and area planted (·····) in commercial areas.

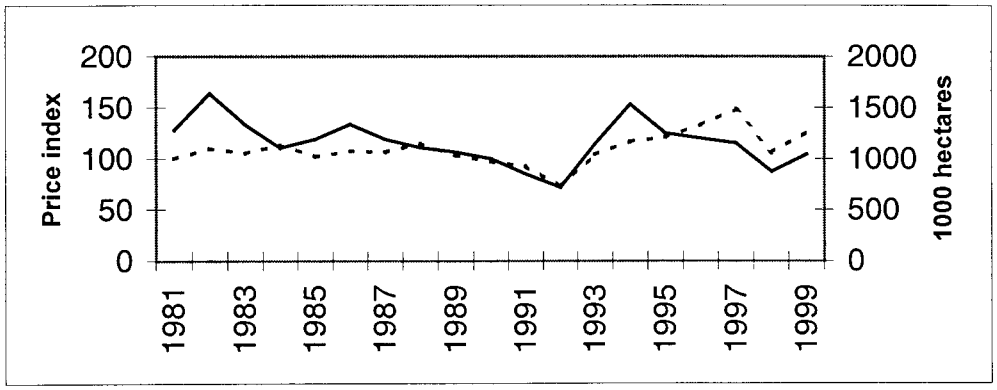

Figure 3.9. The real price of maize, 1990 =100 (—) and area planted (·····) in communal areas.

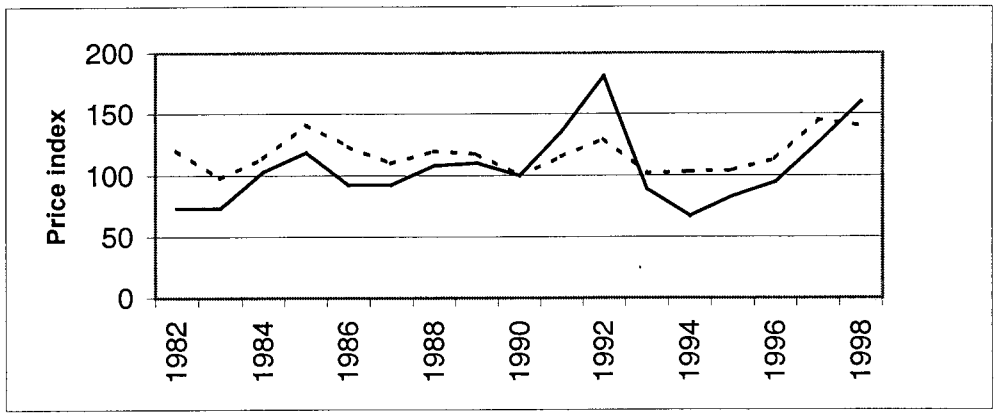

Figure 3.10. The price of fertilisers (Compound D) deflated with producer prices of maize (—) and the consumer price index (·····).

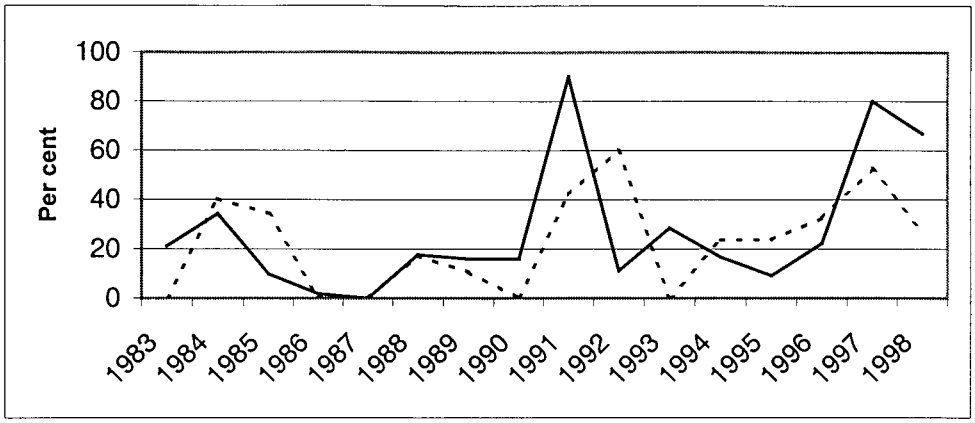

Figure 3.11. The rate of change in the price of Compound D (—) and the US dollar exchange rate (·····).

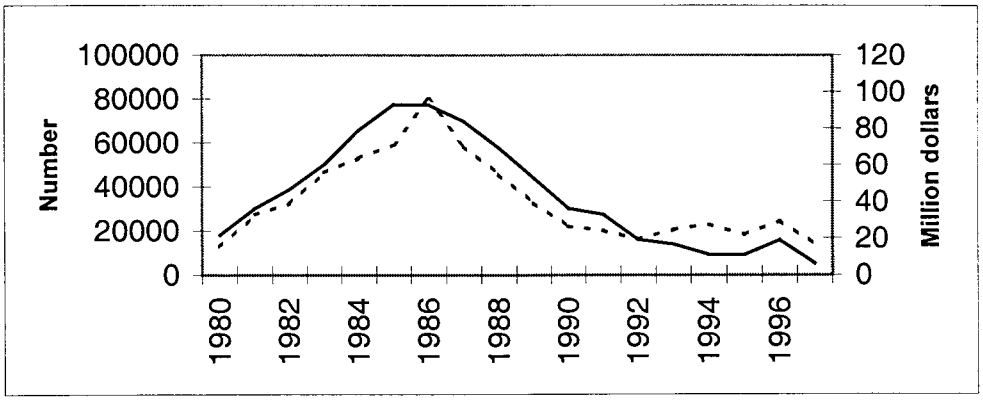

Figure 3.12. The number of AFC loans to smallholders (—) and the real value of the loans (·····).

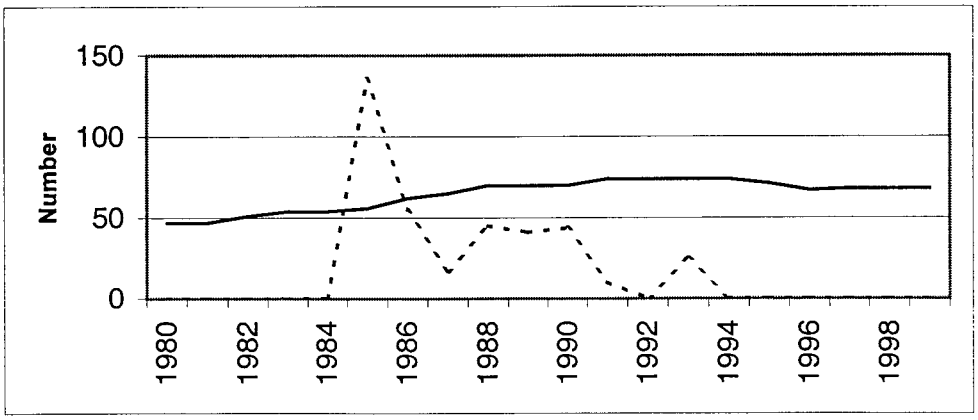

Figure 3.13. The number of GMB depots (—) and collection points (·····).

decreased during ESAP, this was a continuation of a process that had started several years earlier. One reason for the decline was poor repayment performance, which resulted in large losses for the AFC (Chimedza, 1994). The downward trend seems to have stopped at the end of the 1990s, and the supply of credit has settled at a level close to the values for 1980. As a comparison, at the end of the 1990s the number of loans per year was somewhat less than 20 000 while they were close to 80 000 during mid-1980s.

Before Independence many smallholders had difficulties in marketing their produce because of lack of infrastructure and high transportation costs. Hence, the GMB established depots and collection points in the communal areas during the 1980s, and this contributed to an increase in the amounts of marketed maize (World Bank 1995b). In relation to the planned commercialisation of GMB, there were discussions of closing down depots in communal areas. However, at the end not a single depot was closed in the communal areas, though the number of collecting points was reduced from over 140 in 1986 to zero in 1993. Fig. 3.13 depicts this development.

The reduction in collection points is likely to have affected many communal farmers negatively. However, transportation costs also increased, at least temporarily, when the GMB stopped deducting the costs for bags and transportation to depots from the payments; during recent years farmers have had to pay up-front for transportation. At the same time private trader activity has increased significantly in the rural areas, and traders pay the farmers on the spot while the GMB sometimes has made payments more than a month after delivery (APAP III, 1997). On the other hand, as reported in Section 2.2, there is also evidence that traders have managed to pay too little, at least during the first years of the reform process.

3.2.1 Analysis of Productivity Growth

In this subsection we look closer at productivity growth in the communal and commercial sectors. The main purpose is to see whether the deregulation of the agricultural sector affected land productivity. Since variation in rainfall has a large impact on the size of harvests, regression analysis is employed to detect changes in productivity for a given amount of rainfall. The emphasis is put on land productivity even though other factors of production than land are of interest. The reason is twofold: First, land is a scarce resource in Zimbabwe, at least within the communal areas. Second, there is a paucity of time-series data on the use of inputs in the production of specific crops, and that makes it difficult to calculate other measures of productivity.

One should not draw any conclusions about changes in productivity without first examining the variation in rainfall. This is illustrated by Fig. 3.14 that plots yield per hectare and rainfall for communal and commercial sectors over the period 1980 to 1999, with the mean and variance of the yields per hectare adjusted to facilitate the interpretation of the graphs. Note that the data are constructed such that 1981 shows rainfall between October 1980 to April 1981 and the yield per hectare for 1981. The two series follow each other very closely in both sectors, indicating that rainfall accounts for most of the variability in land productivity; the correlations are about 0.8 in both sectors. The shift in the level of productivity in the communal areas that took place in 1985 (see Fig. 3.7)

seems more like a slow but erratic increase that begins around 1982 when the amount of rainfall is considered.

In large-scale commercial farming, maize production is sometimes assumed to be relatively unaffected by rain because of widespread use of irrigation (see APAP III 1997). This might be true, but it is certainly also true that variations in productivity to a large extent can be explained by variations in rainfall, as shown by Fig 3.14. Note also that productivity, given the rainfall, appears to decline during the 1990s in the both sectors but somewhat more in the communal areas.

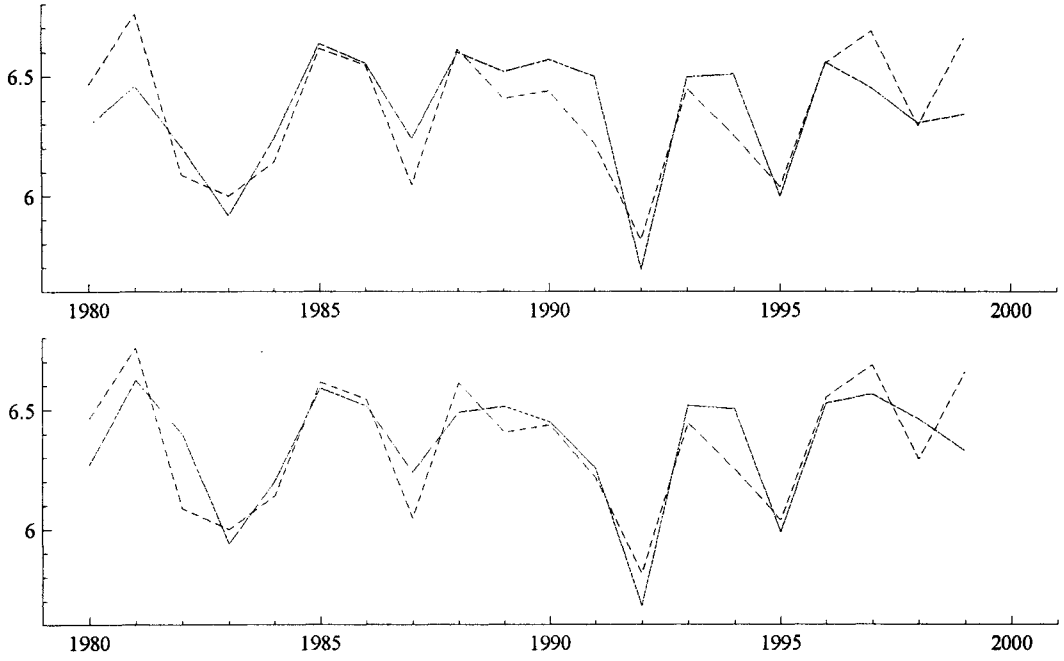

Figure 3.14 The logarithms of yield per hectare (—) and rainfall (·····) in communal areas (top panel) and commercial areas (bottom panel). The yields per hectare have been mean and variance adjusted.

To formally test whether land productivity has changed during the reform period we ran regressions with yield per hectare as the dependent variable, and the variables discussed above as explanatory variables (loans, depots, relative prices, etc). All explanatory variables were included both contemporaneously and with lags. The main results are reported in Table 3.2. Not surprisingly, we found the amount of rainfall to be the by far most important determinant of variations in land productivity. A 1% increase in rainfall increases land productivity by 1.7% in communal areas and 0.9% in the commercial areas. The only other variable that entered the model significantly was the number of depots and collection points in the regression for the communal areas; the estimated coefficient is 0.5. Its effect on productivity can be explained by two factors. First, lower transport costs make it more profitable to use more fertilisers and labour per hectare planted. Second, the change in number of depots is likely to be related to government's effort to increase production in the rural areas by providing extension services, free seeds, etc. and it thus serves as a proxy for omitted variables.

Table 3.1 Regression Results

Modelling log of yield per hectare in communal areas
Sample:1980 to 1999

Variable	Coefficient	t-value
Rainfall	1.68	5.54
Depots and collection p.	0.47	2.10
Dummy	-0.20	-1.12

$R^2 = 0.75$ F(3,16) = 15.70 [0.0001] DW = 2.78

Modelling log of yield per hectare in commercial areas
Sample:1980 to 1999

Variable	Coefficient	t-value
Rainfall	0.94	6.02
Dummy	-0.08	-0.86

$R^2 = 0.69$ F(2,17) = 18.24 [0.0001] DW = 2.43

Notes: All the variables are in logarithms. A constant was included in all regressions.

To test if deregulation affected labour productivity we added a dummy variable for the period 1995-1999. The choice of this time period was based on the fact that all controls on domestic maize movements were removed by 1994/95 season, and that serious reform of the GMB had begun. The estimated coefficient for the dummy turned out to be negative but not statistically significant, indicating that the agricultural reforms have failed to bring about an increase in land productivity. Considering the importance of land productivity, more detailed analysis is required to understand how ESAP and other policy changes have affected its growth.

4. THE MAIZE MEAL MARKET

In Zimbabwe, as in most developing countries, the food marketing system is one of the most important parts of the economy, playing a major role in provision of national food security. The impact of economic reforms on the functioning of the marketing system is thus highly relevant. This was clearly shown in January 1998 when violent demonstrations erupted in Harare over price increases on basic foods.[4] As a result, government reversed the move by millers to raise the price of maize meal by 21%. Subsequently the government gazetted the prices of maize and maize (roller) meal, making it impossible for the GMB

[4] There were also other reasons for the public unrest, such as the 2.5% increases in sales tax.

and the millers to raise prices without government approval. This meant that price control abolished in 1993, was re-introduced. The argument used by government in defence of its new policy stance was that the millers had formed a cartel, or more informally, they were abusing their market power. The millers have of course strongly objected to this accusation.

In this section we look at the functioning of one of the most important components of the food marketing system, the maize meal market. The focus is on how it has responded to the reforms in general. Moreover, an attempt is made to evaluate whether the maize-meal market should be characterised as a monopolistic market or if there is a reasonable amount of competition among the millers.

Because of the surge in interest in the determination of maize-meal prices in Zimbabwe (see Ndlela et al. 1999), the following sub-section discusses the concepts of market power and competition in some detail. Sub-section 4.2 reviews the structure of the maize meal market and the changes that have occurred during the 1990. In Subsection 4.3 to 4.7 the evolution of different relative prices and input prices is analysed, Subsection 4.8 looks at profits in the milling sector, and 4.9 concludes this section.

4.1 Competition, Market Power and Abuse of Market Power

The re-introduction of price controls on maize meal in 1998 was motivated by the argument that millers were abusing their market power. According to government officials, the rapid price increases during the end of 1997 and January 1998 provided support for this argument (Mail and Guardian, Jan. 20, 1998). In particular they noted that all millers had, or planned to, raise prices by the same percentage. The rather loose expression 'abuse of market power' is probably best defined as a belief that the millers have formed a cartel that behaves as monopolist and charges monopoly prices. If the millers collude and in practice function as one firm, prices are higher and output lower than in a situation of free competition. The costs to consumers of such behaviour can be substantial.

According to standard microeconomics, a firm is unable to exercise market power when it is willing to sell its output as long as the market price is above the firm's marginal cost of production. This implies that with perfect competition the market price will be equal to marginal cost. In a monopolistic market, a firm maximises profits by supplying goods until its marginal revenue is equal to marginal cost. The price will in this case be higher than the marginal cost of producing the last unit of output. Two factors are critical in determining if a firm, or a group of firms, can exercise market power, the sensitivity to price changes of market demand and the supply of other producers.[5] When consumers are very sensitive to price changes, a small price increase will lead to a large decline in demand. Thus profits are affected negatively. On the other hand, when consumers are insensitive, a big price increase leads to a small drop in consumption of the good in question. In this case profits will increase. The ability of a firm to influence prices thus depends on how essential the product is for the consumers, i.e., whether it is a basic commodity or luxury good, and if there are close substitutes available.

[5] See Borenstein, Bushnell and Wolak (1999) for clear and concise discussions about the concept of market power.

Likewise, if the supply of other producers is sensitive to price changes then the effect of one firm's attempt to raise prices will be lower profits. This will come about because the increased supply of the other firms reduces the market price. However, if the supply of the other firms is insensitive, because of explicit or implicit collusion or because of supply constraints, then a firm might succeed in raising prices.

In studies of the functioning of markets, emphasis was traditionally put on the degree of concentration, that is, the number of firms competing in the same market. However, as apparent from the two factors mentioned above, the fact that a firm has a large market share does not automatically imply that it also has market power. In the case where both demand and supply of other firms is sensitive to price changes it can be difficult for a firm to exercise market power even if it has a significant share of the market.

The most straightforward way to evaluate if there is perfect competition in a market or if some firms have market power is to compare the marginal costs of firms with the market price. However, in practice this is not easy to do. One reason is that marginal costs are not known and they can be hard to calculate. Another difficulty in measuring market power is that there is rarely perfect competition in real-world markets, possibly apart from international commodity markets, and perfect competition might be too strict to be used as benchmark. Hence, one has to make a subjective judgement of what is a reasonable degree of competition. Nonetheless, during the last two decades significant advances have been made in developing methods for testing of the degree of competition in different markets.[6]

The data requirement for estimating measures of market power need not be very demanding; methods exist where it is sufficient with prices and quantities for the market as a whole. Nevertheless, in our case we do not have information on the quantities of maize meal produced and sold in Zimbabwe; only prices are readily available. Thus the approach used is this study is primarily to look at how spreads between input and output prices, between different outputs, and between output prices in different regions have developed. Policy changes, such as the abolishment of price controls in 1993 and the partial re-introduction of controls in 1998, are of central importance when interpreting changes in spreads.

When the expression 'abusing its market power' is used there is probably a belief that the market power leads to excess profits. Indeed, it sometimes seems as if the main concern in the policy debate in Zimbabwe is large profits, not the lack of competition.[7] Hence, in addition to prices, we also look at information about profits in the milling sector, and compare it with other sectors and the milling industry in neighbouring countries. However, it is important to note that profitability by itself is not a good indicator of market power when firms have durable assets, such as machinery. And this is the case for the milling industry. Under such circumstances, firms may have low or negative profits during long periods even if they have market power.

---

[6] Bresnahan (1989) reviews a number of approaches that have been developed to measure market power.

[7] In addition to high profits, there is also concern that millers are trying to undermine the government.

4.2 Structure of the Maize Meal Market

Basically three different kinds of maize meal are consumed in Zimbabwe; super-refined meal, roller meal, and hammer (straight-run) meal. Super-refined maize meal, also called polenta or breakfast meal, is mainly consumed in urban areas by middle and high-income earners. The production process is fairly complicated and out of one tonne of maize only about 600kgs maize meal is extracted. Super-refined meal is currently only produced by the three large-scale millers, Blue Ribbon, National Foods and Victoria.

Roller meal is a semi-refined meal that is produced by both large-scale and small-scale millers.[8] The production process of roller meal is simpler than for super-refined meal and the extraction rate is much higher, e.g. about 80-85%. For decades prior to reforms this was the kind of maize meal consumed in urban and maize-deficit rural areas. One reason for the widespread consumption of roller meal was that government ensured low prices through price controls and subsidies. Indeed, during the 1980s there were occasions when the subsidy was so large that the price the smallholder received when selling maize to the GMB was higher than the consumer price of roller meal.

The least refined type of meal is hammer meal. It is a wholemeal that contains the entire maize seed and the extraction rate is close to 100%. Hammer meal is mainly produced by hammer mills and to some extent by small-scale mills, i.e., mills that also can produce roller meal. The normal procedure is that households bring their own maize to the mill where it is milled for a service charge. The shelf life of hammer meal is much shorter than refined meals, about four to five days depending on the climate, and this makes it suitable for small mills situated close to their customers.

Up until the 1993-1994 season, government controls in the maize marketing system favoured the processing of refined meal by large-scale firms and inhibited the development of the hammer mills. Hence, despite the fact that the processing costs for hammer-milled meal is less than one third of those of roller-milled meal, few hammer mills existed before reforms (Jayne and Rubey 1993). The maize-meal market was totally dominated by four big companies National Foods, Blue Ribbon Victoria Foods and Midlands, where the two largest firms, National Foods, Blue Ribbon, handled 85% of all industrially produced meal.

The introduction of agricultural reforms led to a rapid change in the structure of the maize meal market. As the GMB started selling maize to private traders and regional movements of maize were allowed, large-scale mills suddenly faced competition from newly established small-scale and hammer mills. One of the companies, Midlands left the market and the market share for the others dropped dramatically. To get data to assess the size of this change in detail is not easy. However, according to representatives of Blue Ribbon, the three remaining large-scale mills currently produce 230 000 tonnes of maize meal per year, while small-scale mills produce about 300 00 tonnes. This means that the market share of the large-scale mills is about 40% for industrially produced maize meal.

To get a figure for the total market, the size of Zimbabwe's maize meal market must be estimated. By assuming that every (adult equivalent) Zimbabwean consumes 0.3 kg of

[8] A common definition of a small-scale mill is one that can produce roller meal. This distinguishes it from the hammer mills, which mainly produce hammer meal.

maize meal per day, then somewhat less than one million tonne is needed per year.[9] This is close to what one gets by using the official estimate of the annual consumption of maize of 1.8 million tonnes. Since part of these 1.8 million tonnes goes to stockfeed and brewing, between 1.3 and 1.6 million tonnes are left for human consumption.[10] If all this maize is processed to maize meal, then roughly 1 million tonnes are obtained. The market share is thus 20% to 25% for the three large-scale mills, and about 30% for the small-scale mills.

The hammer mills process the biggest volumes; they have roughly about 50% of the market and supply 500 000 tonnes maize meal. How many that are operating in Zimbabwe is not known, but a crude estimate is that there are more than 30 000. This estimate is based on the fact that during the last 20 years about 35 000 hammer mills were produced in the country, and they are known to be very durable (E. Cross, CZI, in conversation).

The maize meal market is to some extent segmented into urban and rural areas since traditionally most of the consumption of roller and super-refined meal took place in towns. It would thus be interesting to have information about market shares in urban areas. We can get a rough idea by assuming that all small-scale mills operate in urban areas. This implies that they have at least half of the urban market for industrial meal.[11] If we also consider that a lot of hammer meal is consumed in towns, then the market share of the big mills should be significantly less than 50%. According to a survey carried out in 1992 there were 57 hammer mills in Harare, producing 11 000 tonnes maize meal during the 1991/92 season (Jayne and Rubey 1993). This amounted to 8% of total maize meal consumption that year. Most likely there are several hundreds hammer mills in Harare, but the exact number is not known.

An indirect way of obtaining information about changes in market shares and the importance of hammer mills in urban markets is to look at consumption patterns. During the period 1991 – 1994 three surveys were carried out in Harare, providing information on maize meal consumption before and after market reforms (see Jayne et al. 1995). Table 4.1 reports the percentage consumption of refined meal (super-refined and roller meal) and hammer meal in households of different income groups. In 1991 94% of all maize meal consumed was refined meal. By 1993, when the process of decontrol had started, the percentage dropped to 72%, and 9 months after the completion in 1994 it had declined to 44%. Since large-scale mills do not produce hammer meal we can conclude that they lost at least half of their market share within a year after the removal of marketing controls. Whether they have managed to recover some of the lost market shares since 1994 is not known, but it seems unlikely considering the production figures reported above and anecdotal evidence on growth in the number of hammer and small-scale mills. Hence, one of the most striking effects of the reforms of the agricultural marketing system was the change in consumption from roller to hammer meal and the loss of market shares

---

[9] Jane and Argwings-Kodhek (1997) find that maize consumption in Nairobi is about 0.23kg per day. Assuming that it is similar in Harare and somewhat higher in rural areas gives us the 0,3 kg.

[10] Stockfeeders and brewers accounted for about 15% of GMB sale in the 1980s (Jayne and Rubey 1993).

[11] The Small Scale Millers' Association has about 120 members and in addition there might be about another 300 mills (E. Cross, CZI in conversation).

by the large-scale mills.

An interesting pattern apparent in Table 4.1 is that the higher the income is the more refined meal is consumed relative to hammer meal (see also Table 2.1). This indicates that the industrial mills tend to serve the upper end of the market. The decline in real wages experienced by many workers since 1994 is likely to have strengthened this phenomenon. However, the recently introduced price controls on roller meal might have shifted consumption away from hammer meal towards roller meal since price differences appear to have decreased.

Table 4.1: Percentage of Households by Income Group Consuming Refined and Hammer Meal 1991- 1994

	1991		1993		1994	
Income groups	Refined	Hammer	Refined	Hammer	Refined	Hammer
1(lowest 20%)	92	8	68	32	45	55
2			67	33	47	53
3	94	6	75	25	58	41
4			81	21	61	38
5 (highest 20%)	97	3	83	18	67	33
Total sample	94	6	72	27	56	44

Source: See Jayne et al. (1995).
Note: Refined meal includes roller meal and super-refined meal. The data for 1991 refers to income terciles. The survey in 1994 was conducted 9 months after most grain marketing restriction had been eliminated.

4.3 Maize and Maize-Meal Prices

It would have been ideal to have access to detailed data on prices, consumption, and production costs of the mills when evaluating the degree of competition in the maize-meal sector. This information is not available, however. Thus we have to rely on prices and price indexes on inputs and outputs with somewhat different coverage, and second-hand information on production costs. The price data used in the study are the following: the average retail prices of roller and super-refined maize meal in nine urban areas, the consumer price index for maize meal covering the whole of Zimbabwe, producer prices of Blue Ribbon, the largest maize meal producer, the producer price index for maize meal, and the GMB and Zimbabwe Agricultural Exchange (ZIMACE) prices of maize.

To give an overall picture of how the marketing system for roller maize has responded to economic reforms, the difference in per cent between what the farmer is paid for the maize (PP) and the consumer price of roller meal (CP) is reported in Table 4.2 for the period 1989/90-1998/99. The producer price is the price paid by the GMB and the consumer prices are from two different urban areas, Harare and Gwanda. These two places represent the variation found in the data from the nine urban areas quite well. The spread between the prices covers the costs of extraction of maize meal, transport and bagging, costs related to the retailer, profits, etc, and should give a rough indication of changes in the overall efficiency of the marketing system. By measuring the spread in per cent the effects of inflation is partly removed; in the ideal case, when all other prices are growing by the same rate and there is no change in the production structure, the whole inflation effect is eliminated.

Table 4.2 shows that there have been large fluctuations in the spreads. During the years prior to reforms, this was probably mostly due to variation in harvest sizes and producer prices. For instance, the severe drought in 1992 and the following drop in income, is likely to have contributed to the drop in the spread from 140% in 1991/92 to 80% in 1992/93. In 1993 there was a sharp increase in producer prices (about 65%), and this forced down the spread even further in 1993/94. During the following years the decontrolled maize meal prices rose much quicker than maize prices and in 1995/96 the spread reached almost 200%. This coincided with the drought in 1995, indicating that excess demand for maize led to higher consumer prices, in contrast to the previous drought when controls prevented millers from raising prices. The spread peaked at 216% during 1997/98 in Harare, the period price controls were reintroduced. However, in Gwanda it only rose to 144%, a marginal increase from previous year. During the 1998/99 there was a dramatic drop in the spreads as the price controls came into full effect. Government intervention thus appears to have had a strong effect on the some of the profit margins in food marketing.

Table 4.2 Spread between GMB's producer prices of maize and consumer prices of roller meal, 1990-99 (in per cent)

		89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Harare	CP-PP	127	117	138	84	72	134	190	163 (122)	216 (105)	119 (61)
Gwanda	CP-PP	127	117	138	84	70	150	189	136	144	77

Notes: The producer price (PP) is the price paid by the GMB to farmers. The consumer maize-meal price (CP) was calculated using the average price for 20kgs packs. The values in parenthesis are the average ZIMACE price for maize delivered in Harare. The sources are the GMB, ZIMACE and the CSO.

It is interesting to note that the spread, and consequently the prices, in the two urban areas have developed differently since 1993/94. In 1994/95 the spread rose quicker in Gwanda than in Harare but after that it has become a lot lower. Gwanda is situated in Matabeleland South, a dry region with limited maize production, and because of transportation costs one would have expected prices to be higher there than in Harare that is close to maize-growing areas. One explanation for this development is that the small-scale milling industry has expanded rapidly in Matabeleland and has a larger market share in Gwanda than in Harare. Thus competition can have forced down prices in spite of the price controls. An indication of the important role of the small-scale milling industry in the area is the fact that the large-scale milling companies use pan-territorial pricing.[12] Their market share thus appears to be relatively small in Gwanda. An additional explanation for the low spread could be that the region is poor and demand for maize meal is low.

We can conclude that there is no clear trend in the relation between maize-producer prices and maize-meal consumer prices and no indication that reforms have reduced the margins significantly. This could be due to changes in government subsidies to the GMB, in particular during the first half of the 1990s. These would partly show up in changes in the spread between the GMB's buying and selling prices. Hence, in Table 4.3 we report the shares of the consumer price that goes to farmers, the GMB, and millers and retailers. The selling price of the GMB price includes most of the transportation costs to the mills. However, the release of the Strategic Grain Reserve in January 1998 came with additional

[12] The claim that large-scale millers use pan-territorial pricing and give few discounts are based on conversations with M. Nyamupingidza, Managing Director of Blue Ribbon and Mr. E. Cross of the CZI.

transport costs for the millers and a requirement to pay cash up-front, forcing the millers had to borrow money to finance their purchases. The data might therefore overestimate the margins for millers so to capture some of these changes we also used the average ZIMACE maize price for deliveries in Harare for the period 1996/97 – 1998/99, instead of producer and selling prices. In any case, the shares reported in Table 4.3 should be regarded as rough indicators only; for instance, they are averages that do not reflect seasonal variations and several other aspects are not considered.

Over time, the distribution of shares varies a great deal. On average, farmers get about 45%, while millers and retailers receive a bit more than 40%. The data do not show a systematic change in the shares going to the GMB; they seem to fluctuate up and down. Hence, we cannot say that government subsidies to the GMB are responsible for the lack of improvement in efficiency in the marketing system observed in Table 4.2.

Nevertheless, there appears to be a change in the distribution of shares in conjunction with price decontrol in 1994; the share of millers and retailers increase from 31% to 49% and the one of farmers decline significantly. Moreover, the data from the GMB do not show any evidence of a reduction in the margins for millers and retailers after the reintroduction of price controls. However, since we know that some costs were shifted from the GMB to the millers in the beginning of 1998, the ZIMACE prices might be better indicators of the real costs of procuring maize. And they show a decline from 51% in 1997/98 to 38% in 1998/99.

Table 4.3 The Division of Shares of the Consumer Price of Roller Meal in Harare

	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Farmers	0.44	0.46	0.42	0.54	0.58	0.43	0.35	0.38	0.32	0.46
GMB	0.06	0.16	0.14	0.14	0.11	0.08	0.21	0.11	0.17	0.08
Millers[a]	0.50	0.38	0.44	0.32	0.31	0.49	0.45	0.51	0.51	0.47
Millers[b]								0.55	0.51	0.38

Note: The shares were obtained by dividing the producer price and the difference between the selling price and the producer price of the GMB with the consumer price of roller meal. For details see note in Table 3.2.

[a] In these shares both millers and retailers are included.
[b] This line shows the shares for the millers and retailers based on the ZIMACE price of maize delivered in Harare.

4.4 Comparing Consumer Prices across Urban Areas and Maize Meal Varieties

This sub-section analyses the development of consumer prices for roller meal and super-refined meal in different regions of Zimbabwe. Before the decontrol of prices, maize meal prices were the same all over the country. After 1993 we should observe that prices differ between regions depending on the closeness to maize producing regions, the level of income and the degree of competition.

The evolution of the price of roller meal relative to the one for super-refined meal is of interest because both prices were controlled up to 1993, then the price of roller meal, but not super-refined meal, was re-imposed in 1998. Furthermore, since currently there are only three producers of super-refined meal there are ample possibilities for collusion. This means that there is probably little competition in the production of super-refined meal. On

the other hand, demand for super-refined meal is likely to be more sensitive to price changes than roller meal, which might make it hard for firms to influence its price. This is because roller meal is a fairly close substitute to super-refined meal and it is cheaper to produce. Hence, although concentration in production is high, firms might have little market power if consumers are sensitive to price changes. The relative price between super-refined and roller meal is also of interest because it gives an indication of distributional effects of deregulation since super-refined meal is consumed by middle and upper classes. It should be emphasised though that one of the most important distributional effects of deregulation has been the increase in availability of hammer meal price data (see Jayne et al. 1996).

In Fig. 4.1 the development of prices of super-refined maize meal in Harare, Bulawayo, and Gwanda are graphed, with Harare representing the six towns not included. Prices used are for 20kgs bags of maize meal and the period runs from January 1990 to May 1999. As a result of price controls, all prices were identical up to May 1993, and there were only minor differences between them before April 1994. The effect of liberalisation is clearly visible from beginning of 1994 when price changes begin to occur almost every month and price dispersion increases. In Harare the price rises rapidly, almost doubling from April 1994 to the beginning of 1996. On the other hand, in Gwanda there is only a very slow increase in the price level until the end of 1997, while Bulawayo initially experiences a decline in the price level until 1996. In mid 1997 all three prices start to grow rapidly, while dispersion increases even more. As a result, during 1999 the price of super-refined maize meal is almost twice as high in Harare than in Gwanda.

Roller meal prices for the same time period and urban centres are shown in Fig. 4.2. A striking feature of their development is the similarity between different urban areas when compared to the prices of super-refined meal. After liberalisation in the beginning of 1993 all prices rose rapidly from slightly more than Z$20 reaching about Z$70 in Harare and Gwanda and Z$60 in Bulawayo during the first months of 1996. Then prices declined as a result of good harvests until the end of end of 1997, when there were sharp price increases in Harare and Bulawayo. In Gwanda the price also rose but much slower, and for the period up to May 1999 it was on average much lower than in the other two urban areas. Price controls implemented in 1998 thus appear to have led to converging prices in Harare and Bulawayo, while the price in Gwanda diverged.

As expected, prices of super-refined meal and roller meal have behaved quite differently since liberalisation. However, the expectation that increased competition in the roller-meal market, due to the emergence of small-scale mills and hammer mills, and the oligopolistic market for super-refined meal, would lead to smaller increases in prices of roller meal than super-refined meal has not come true. Fig. 4.3, which plots the spread in percent between super-refined and roller meal in Harare, Bulawayo and Gwanda, illustrates this clearly. However, in contrast to previous graphs Harare now constitutes one extreme instead of representing the urban areas outside of Matabeleland. Overall, super-refined maize meal has become cheaper relative to roller meal since liberalisation. This probably depends on the similarity between the two products and the ease by which people switch from super-refined to roller meal. Thus, we have a case of a commodity where demand plays an important role in determining its price, and the market power is relatively small even if there are only three producers.

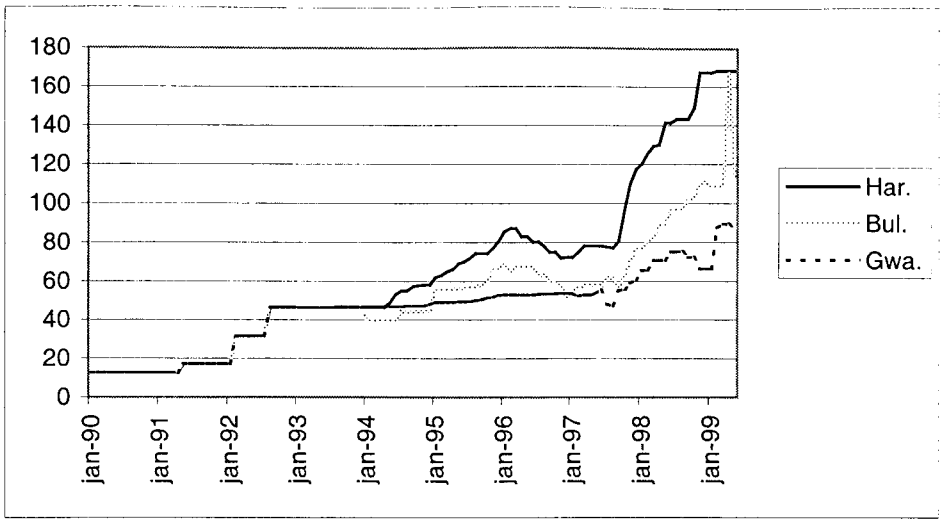

Figure 4.1 Consumer prices of super-refined meal in Harare, Bulawayo and Gwanda.

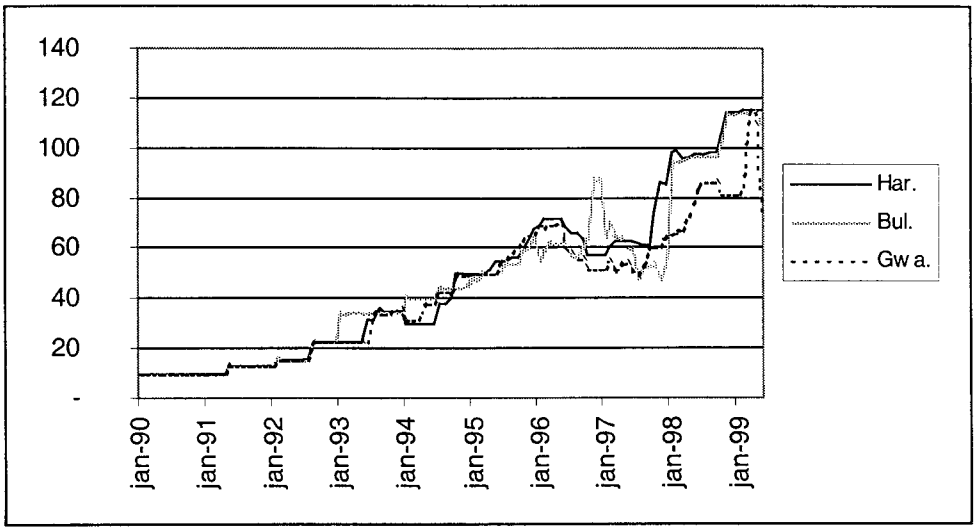

Figure 4.2 Consumer prices of roller meal in Harare, Bulawayo and Gwanda.

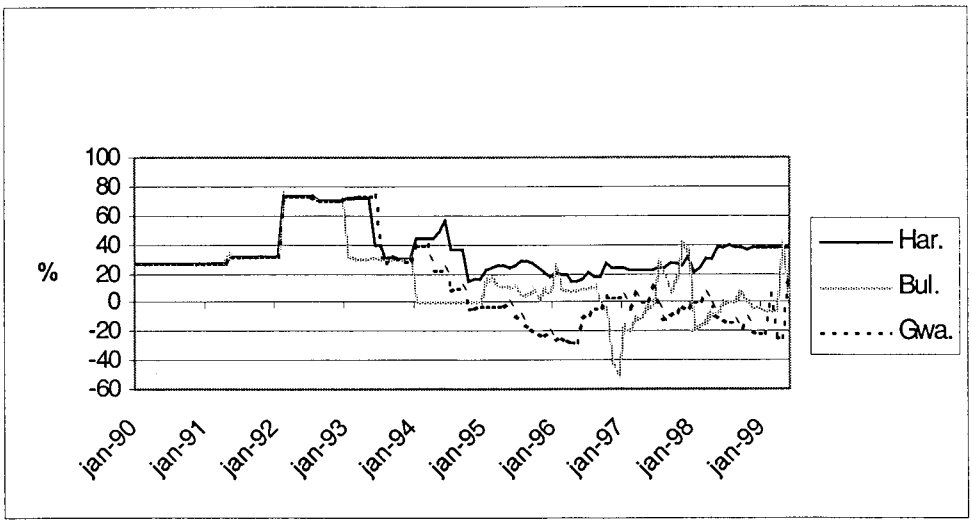

Figure 4.3. Spread between consumer prices of super-refined and roller meal.

4.5 Maize Prices and Producer Prices

So far we have mainly looked at shop prices of maize meal. The debate about market power and price controls on maize meal is about millers, however. They are in the middle of the supply chain and might have managed to raise their margins while the retailers have lowered theirs. In this section we therefore use two sources of information on producer prices. Blue Ribbon has made available prices from the end of 1993 to July 1999 and the CSO publishes an index for the producer price of maize meal (PPI). The information from Blue Ribbon should be relevant for the other two big millers since they are known to have similar prices. Indeed, Tobaiwa (1998) found that the whole-sale price for a bag of 20kgs roller meal charged by National Foods and Blue Ribbon was identical during the period July 1997 to March 1998. Moreover, since few chains obtain discounts and there is very little discounting for final consumers the Blue Ribbon prices reported should reflect actual prices quite well. The PPI has the advantage of starting in 1988. However, it is made up of prices of super-refined, roller and hammer meal, equally weighted, but large mills and many small-scale mills do not produce hammer meal. Moreover, since it is an index we cannot use it to measure the actual spread, only the change between different periods. Unfortunately, the CSO has not stored the prices used to construct the PPI.

In Fig 4.4 the difference in per cent between the PPI and GMB selling price, and the roller-meal price of Blue Ribbon and the GMB selling price are plotted. The base period is 1988 for the PPI spread and November 1993 for the Blue Ribbon spread. By construction the spread is zero during the base periods. Note also that the PPI index ends in December 1998. As evident from the graph, the PPI spread is clearly lower for the period after 1993 than before. This is an indication that liberalisation has led to higher competition in the milling industry or that productivity has grown. Moreover, during the latter half of 1997 there is a drop in the spread, showing that millers in general are unable to quickly pass over increasing costs on retailers and consumers.

The development of the spread for Blue Ribbon differs significantly from the one for PPI. Both indexes were about zero from the end of 1993 until late 1994 and then they followed each other closely until January 1996. Then the Blue Ribbon spread increased sharply, later it dropped somewhat but stayed far above the PPI spread. The period prior to the re-introduction of price controls is of particular interest. In July 1997, a the record spread of 50% was reached as the result of Blue Ribbon raising maize meal prices while the price of maize remained stable. Subsequently the price of maize increased, reducing the margin to 16% in October and 1% in November. During 1998 the average margin was lower than during 1996 and 1997, but about 15 percentage points higher than during 1994 and 1995. Whether this constitutes an increase in real terms is hard to say, partly because transportation costs and interest payments for millers rose in the beginning of 1998, and partly because some of the prices of inputs used in maize meal production might have increased more than maize prices.

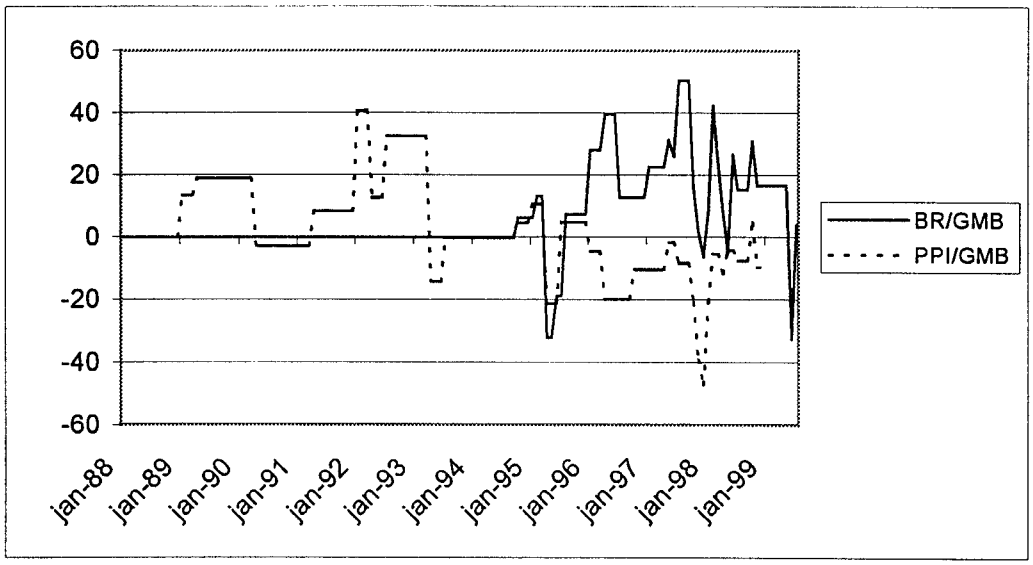

Figure 4.4 Changes in per cent between roller meal prices charged by Blue Ribbon and the GMB selling price of maize (BR/GMB) and the producer price index and the GMB selling price (PPI/GMB). The series start in 1988 and November 1993, respectively.

4.6 Input Costs

It is not easy to obtain detailed information on the costs of production in the milling industry. Nonetheless, it is clear that the cost of maize accounts for by far the largest share in maize milling. According to Blue Ribbon, it constitutes about 80% of variable costs. Other input costs are labour, fuel and electricity, and they amount to about 15% of total variable costs (Ndlela et al. 1999). We have access to monthly price indexes for fuel and electricity, and some information on yearly wages.

The developments of fuel and electricity prices relative to the Blue Ribbon roller-meal price are depicted in Figure 4.5. Since the spreads were fairly stable over the period 1996 - 97, the graph shows that the sharp increases in maize-meal prices during the 1997 partly can be explained by higher input costs. This is one of the explanations given by the millers for the price increases.

Accurate data on wages for the milling industry are hard to get so we use two proxies to measure the cost of labour. These are the wage costs per employee in manufacturing, and the actual minimum wages paid in three manufacturing sectors for which we have data, textiles, tobacco, and leather. In Fig. 4.6 the growth rates of the wage costs and an index constructed with the three wage-series are shown together with Blue Ribbon's roller-meal price. The most important information provided by the figure is that Blue Ribbon's prices vary much more than wages and there is little or no relation between year to year changes. This is probably because wage costs in maize milling are fairly small.

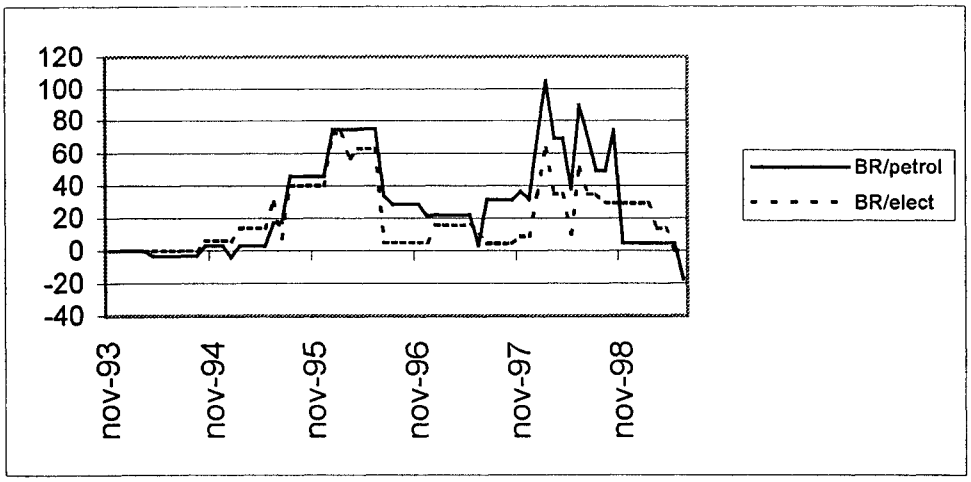

Figure 4.5. Changes in per cent between roller meal prices charged by Blue Ribbon and the price of petrol and electricity.

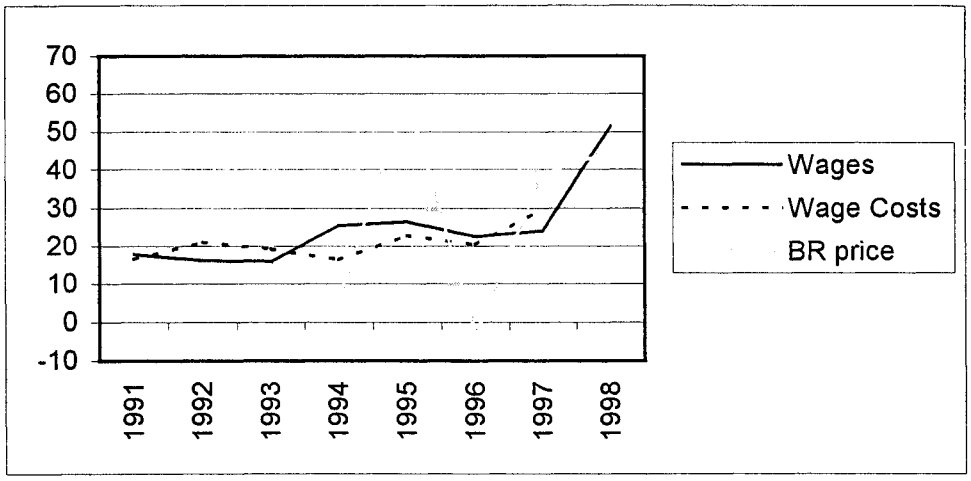

Figure 4.6. The yearly percentage rate of change in wages, wage costs of the manufacturing sector, and roller meal prices charged by Blue Ribbon.

4.7 Producer Prices and Retail Prices

There is thus evidence that Blue Ribbon, and most likely National Foods and Victoria, raised prices by large amounts during the latter half of 1997. To show how this affected consumer prices Fig 4.7 depicts the percentage spread between the consumer price of roller meal in Harare and Gwanda and the price charged by Blue Ribbon. There is a lot of variation in the mark-up of the retailing sector, probably as a result of variation in supply and demand for maize meal. For instance, in1994/95 season there was a sharp rise in the mark-up. The reason was that farmers, due to the drought, supplied less maize than during the previous year and that demand for maize meal went up because many farmers had little maize for own consumption. In 1995/96 and 1996/97 the harvests were large, and increases in supply combined with declining demand forced shops to lower the mark-up. The harvest of the 1997/98 season was much worse than the two previous ones, but much better than the 1995/96 season. In spite of this, the mark-up turned negative in July in Harare, and Gwanda it dropped from –5% to –35%. In Harare retailers managed to make the margin positive in October, while it continued to be negative most months in Gwanda.

Although the data show that margins sometimes are negative, this does not mean that maize meal was actually sold at a loss; our data are not accurate enough to provide such information and we have no information about stocks. However, the data do indicate that margins dropped when Blue Ribbon raised prices in mid 1997, and that most likely the retailing sector initially absorbed a great deal of the price increases. They also suggest that other mills, such as the small-scale ones, probably did not raise prices as much as Blue Ribbon. This is because margins turned negative in Gwanda already mid-1996, and have since then continued to be negative. Hence, Blue Ribbon and the other large-scale mills probably had a small market share in Gwanda during this period, and their strong brand name made it possible to charge high prices. It is also possible that they had local monopolies in some of the low-density areas. Finally, there is of course the possibility that Blue Ribbon actually charges different prices in different parts of the country.

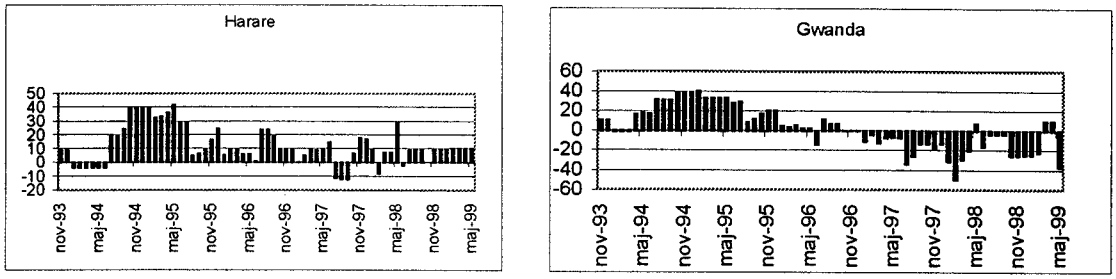

Figure 4.7. The difference between consumer prices and prices charged by Blue Ribbon for roller meal (20 kg bags) in Harare (left panel) and Gwanda (right panel).

4.8 Indicators of Excess Profits in the Milling Sector

In this section we report some indicators of profitability in the milling sector. Although profits may be related to other factors than market power, unusually large or small profits, or changes in profits, might provide interesting information. First we present some results from a study by Jayne et al. (1998) where margins on maize meal were calculated for Zimbabwe and some other comparable African countries. These are summarised in Table 3.4. On average margins were significantly lower in Zimbabwe than in the other countries for the period January 1996- August 1998. This might depend on the use of retail prices in the calculations since, the margins for retailers can vary a great deal. However, there is no reason to believe that this explains why margins were twice as high in Kenya and three times as high in Mozambique.

Table 4.4: Milling Margins in Zimbabwe and some Neighbouring Countries, January 1996-August 1998

Margins (in %)	Zimbabwe	Kenya	Mozambique	South Africa	Zambia
Roller meal	53	106	169	258	94
Hammer meal	23	31	37	-	30

Sources: Jayne et al. (1998)

Note: The retail prices are for the capitals in all countries except South Africa where they are national averages.

Unfortunately data on profits from Blue Ribbon's maize meal production are not easily available. Nevertheless, we have access to data on after tax profits of National Foods for

the period 1988 - 1997. These are reported in Table 4.5. Net profits as a percentage of the turnover varied from 1.7% in 1989 to 7.8% in 1993 and the price decontrol does not seem to have affected it in a systematic way. This means that there is at least no indication of an increase in market power in relation with liberalisation. Moreover, during 1997, the year of the high price increases, net profits declined to 2.1% of turnover. In addition, the rate of return on the capital employed does not indicate high profits either. In fact, the real rate of return is negative during most years.

It is also interesting to note that during the first two years of ESAP, 1991 and 1992, real returns dropped significantly. One reason was probably rapid increases in inflation combined with price controls on maize meal. When price controls were removed in 1993, the rate of return rose considerably and became positive in real terms. Then, during the following year the real rate of return dropped to about −15%, where it remained until 1997. Over this period inflation slowed down so the reduction in profitability was probably not the result of rapidly increasing costs. Instead it is likely that the decline in real rates of return was caused by increased competition from small-scale and hammer mills.

Table 4.5: Selected Indicators on Profitability, National Foods 1988-1997

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Net profits as % of turnover	3.9	1.7	5.7	4.0	7.2	7.8	5.2	4.6	4.0	2.1
Rate of return (%)	11.4	4.5	9.2	7.7	16.7	29.7	6.8	7.0	7.8	3.9
Inflation (%)	7.0	11.7	15.4	23.3	42.1	27.6	22.3	22.6	21.4	18.9
Real rate of return	4.4	-7.2	-6.2	-15.6	-25.4	2.1	-15.5	-15.6	-13.6	-15

Source: Ndlela et al. (1999)

4.9 Concluding Remarks

The results obtained in this section regarding competition in the maize meal market can be described as mixed and highly tentative. Nevertheless, some interesting conclusions can be drawn. Super-refined meal is produced in a market with high concentration since there are only three producers. In spite of this, they do not seem to be able to exercise much market power. The reason is that roller meal is a close substitute to super-refined meal and the price difference cannot be too large. In the production of roller meal there are many producers and there is some competition from the hammer mills, which mostly produce a substitute to roller meal, that is hammer meal. Nevertheless, the three large-scale mills seem to have a strong position in most urban areas. Whether this is due to successful branding or that they behave as a cartel we cannot to say. Since average consumer and producer prices are low relative to the prices of Blue Ribbon (and of the other two big mills), it is reasonable to suspect that the large scale-mills dominate certain areas within the urban areas. If the big mills behave as a cartel, either they do not face competition in these areas because other mills have limited productive and marketing capacity or because there are barriers to entry.

The data indicate that competition is tougher in parts of Matabeleland, since consumer prices are lower there. Another indication of this is that the organisation of the small millers, the Grain Millers' Association of Zimbabwe, is located in Bulawayo. This implies that there should be scope for the entry of new firms in the roller meal market and that it might be a question of time before the dominance of the big mills is broken in other parts

of Zimbabwe. The current use of price controls is probably not conducive to such a development.

5. FOOD SECURITY AND MAIZE MEAL PRODUCTION

In this section we look at some indicators of food security. The focus is on the cost and availability of maize meal at the macro level. Evaluating changes in food security at the micro level is a complex task that requires detailed studies of different regions and segments of society, and this is beyond the scope of this report.

The most straightforward indicator of changes in food security is probably the development of maize production measured in kilograms per capita. This indicator is relevant partly because sufficient domestic supply ensures that maize is readily available in the local markets, and partly because importing maize has several drawbacks. One of these is that the price of imported maize usually is much higher than the domestic price (see Section 6).

Total maize production per capita for the period 1970-1998 is shown by Fig. 5.1. Although the number of kilograms produced per person is highly erratic, mainly due to variations in rainfall, there seems to be a negative long-run trend. However, if one considers that the large harvests during the latter half of the 1980s to some extent were the result of unsustainable public expenditures in agriculture, there appears to be a downward shift in the per-capita level of production sometime in the 1980s. In any case, it is clear that maize production has not kept pace with population growth, which is likely to affect food security negatively.

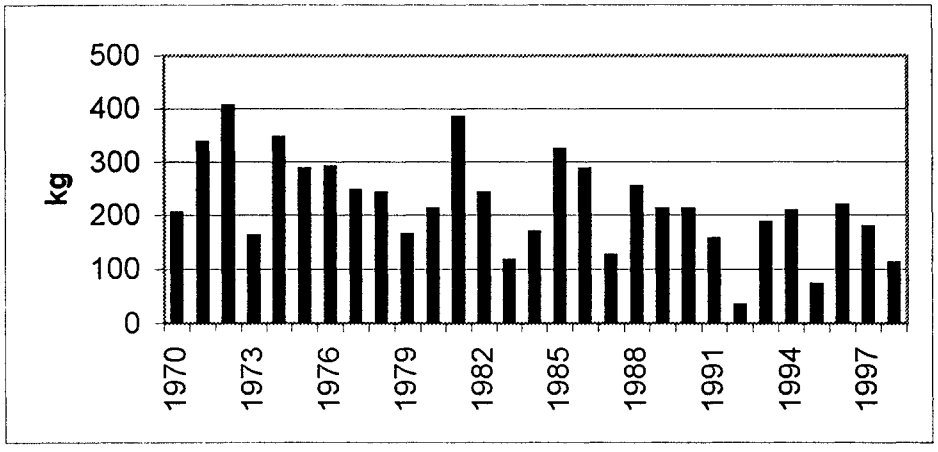

Figure 5.1. Maize production per capita.

Since demand for maize meal can be assumed to be fairly insensitive to price changes, increasing demand in the form of a growing population is likely to put an upward pressure on maize-meal prices when output is lagging behind. This might not have been visible before market liberalisation because of government intervention, but since 1993 there should be an increase in the price of maize meal relative to other prices. Table 5.1 documents the development of the real price of roller and super-refined maize meal in Harare, Bulawayo, and Gwanda. The differences between the urban areas come out very

clearly; prices have grown quicker in Harare and Bulawayo than in Gwanda as noted above. Also, roller-meal prices have behaved as expected even though variations in harvest sizes and government interventions blur the pattern somewhat.[13] Hence, roller-meal prices started rising in 1993 and they continued to grow quicker than CPI during most years. Liberalisation thus generated a substantial shift in the relative price of roller meal. This also seems to be the case for super-refined meal in Harare, where prices went up by about 70% in real terms between 1990 and 1998.

Table 5.1 Real Maize Meal Prices

	Roller meal			Super-refined meal		
	Harare	Bulawayo	Gwanda	Harare	Bulawayo	Gwanda
1990	100	100	100	100	100	100
1991	97	97	97	100	100	100
1992	106	106	106	163	163	163
1993	133	158	130	163	163	163
1994	139	158	151	150	121	134
1995	170	163	171	165	136	117
1996	166	162	153	154	121	102
1997	141	121	117	137	99	87
1998	162	160	125	174	116	87

Note: The real prices were calculated using the CPI. All data are from the CSO.

Another interesting indicator of how food security has evolved is the amount of food that a worker can by for her or his wages. To get an idea about what has happened to maize meal since the start of the reforms, we calculated a measure of how much roller meal one hour's work buys in Harare. The calculations are reported in Table 5.2. Data on salaries and wages were provided by the ZCTU, and they are reported before tax deductions. Out of the available information on wages, we selected series from some of the major economic sectors. Moreover, when available we used the highest and lowest salaries in the sector.

The first three sectors reported belong to manufacturing; they are furniture, clothing and textiles. The grades refer to the lowest and highest levels for which there are complete data. Out of these three sectors, the first has grown relatively well since 1990 in terms of production, while the other two have contracted. Nevertheless, it is clear from Table 5.2 that there has been a substantial drop in the amount of maize meal that a worker can buy in all three sectors. In furniture it has gone down from 3.4kgs in 1990 to 1.0kg in 1999 for the lowest paid worker, and from 3.5kgs to 2.5kgs for the highest paid worker. In the other two sectors the trend is similar. In the last three columns, data from mining and two occupations in the Public Sector, office orderly and general clerk, are reported. These also show sharp declines, in particular the ones in the public sector. The office orderly, for instance, went from 6.1kgs in 1990 to 1.6kgs in 1997.

[13] As illustrated by Fig. 4.1, production was low in 1992 and 1995 (because of drought) and in 1998 (when it rained too much). The bad harvests in 1995 and 1998 probably pushed up prices those years, while the drought in 1992 led to a government induced price increase in 1993. The purpose was to stimulate production. Finally, the re-introduction of price controls in 1998 is bound to have reduced the relative price that year.

Most of the sectors and grades reported follow a similar pattern, a decline to around 1995 and then a small increase; the exception being the public sector where there is no increase at the end of the period. Thus, the somewhat arbitrarily chosen wage series probably give a good indication of recent developments. Overall there was a severe decrease in the amount of maize meal that can be earned by an hour's work. It should be noted that we have used roller meal prices when calculating the indexes, and that most likely there has been a shift in consumption away from roller meal to hammer meal, in particular among low-income earners. Table 5.2 might therefore overstate the decline for some income groups. Unfortunately we do not have detailed information on the development of the price of hammer meal. However, we know from informal surveys in Harare that it was fairly close to the one of roller meal during the second quarter of 1999; price controls on roller meal were probably responsible for this similarity in price levels. This means that we would probably have observed a reduction in the hourly maize meal income even when using the hammer meal price.

Table 5.2 Wage Income Measured in Maize Meal Per Hour's Work (in kg)

Sector	Furniture		Clothing		Textiles		Mining		Public Sector	
Grade/ Position	S1	S6	A	1A2	1	10	1	13	Office orderly	General Clerk
1990	2.4	3.5	2.6	3.4	3.0	9.1	2.8	11.9	6.0	-
1991	2.9	4.2	2.6	3.3	2.9	8.7	2.9	11.5	5.7	10.5
1992	2.1	2.9	1.8	2.2	2.1	6.4	2.1	8.3	4.2	8.8
1993	1.4	2.1	1.3	1.6	1.5	4.5	1.6	6.3	2.9	6.0
1994	1.1	1.6	1.3	1.6	1.5	4.5	1.5	6.0	2.2	5.8
1995	0.9	1.3	0.7	1.4	1.2	3.2	1.2	5.0	1.5	-
1996	1.2	1.7	1.1	1.4	1.3	3.0	1.3	5.3	1.4	4.2
1997	1.4	2.0	1.5	1.9	1.6	3.7	-	-	1.6	-
1998	1.3	1.9	1.3	1.6	1.5	3.6	1.5	5.7	-	-
1999	1.0	2.6	-	-	2.2	5.0	-	-	-	-

Note: The series were calculated using monthly salaries collected by ZCTU and the average price of a 20kgs bag of roller-maize meal in Harare. It was assumed that there are 180 working hours per month.

Based on the evidence presented in this section we conclude that there has been a decline in food security at a national level, at least in urban areas. The most important reason is the rapid decline in wages since the beginning of the 1990s. Another reason is that maize production does not seem to keep up with population growth. This is a long-run trend that started after Independence, and it is likely to have contributed to the increase in real maize prices. However, the reforms have had a number of effects not captured in our analysis. We do not really have much information about the market for hammer meal. For instance, currently the price of hammer meal does not even enter the consumer price index even though hammer meal constitutes a significant share in the consumer basket. There is also evidence that the reforms have led to diversification within smallholder agriculture, which might have improved food security in some parts of the rural areas. Moreover, consumption pattern might have changed significantly during recent years. For instance, there is evidence that Zambians have shifted away from maize consumption to more traditional crops, a process that might be occurring in Zimbabwe as well (Financial Gazette, 4 March, 1999).

6. IMPORTS AND EXPORTS OF MAIZE

One of the main reasons why it is difficult to ensure a sufficient national supply of maize at stable prices in Zimbabwe, as well as in several other African countries, is the characteristic of maize as a borderline case between a tradable and a nontradable good. This characteristic is due to the fact that maize is a low-value and bulky commodity, making transportation costs high in general. For Zimbabwe, a landlocked country surrounded by several countries with insufficient infrastructure, transportation costs are particularly high. As a consequence, domestic and import prices of maize usually differ a great deal. Since there are large fluctuations in domestic maize production, imports and exports therefore play an important role in the Zimbabwean maize market.

The difference between domestic and import prices of maize, combined with variations in domestic supply, has a direct impact on food security. Most governments in southern and eastern Africa therefore still exercise some control over international trade (Jayne et al. 1998). In Zimbabwe, the GMB has a monopoly on exports and imports and the responsibility to ensure that there is an adequate supply of maize in the local market.[14] The official strategy is that the GMB should keep at least 500 000 tonnes of maize in depots as a buffer stock, which is equivalent to about four months domestic consumption. This is expected to keep expensive imports at a minimum level.

Table 6.1 reports the amount of maize that was imported to Zimbabwe over the period 1980-1998. During the 1980s imports were in general negligible, and only in 1980 and 1984 (not separately reported) were there imports of any substance. The 1990s are somewhat different, however. First the drought in 1992 led to a truly exceptional increase in imports, 1.2 million tonnes. Then there were fairly large imports of maize during most years of the period 1993 – 1998.

The increased costs for maize associated with imports can either be borne by the consumers, the producers of maize meal, or the government. Most of the times the GMB seems to have sold the imported maize to millers at a subsidised price, incurring huge financial losses (World Bank 1995a). It is notable that the imports during the 1990s took place in spite of the strategy of the GMB of keeping large stocks, which casts some doubts on its design and implementation.

Table 6.1 Imports and Exports (in thousand tonnes)

	1980-84	1985-89[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998
Imports	83.4	0.0	0.1	0.3	1208.1	492.0	1.4	2.3	126.9	44.4	152.7
Exports	232.0	323.6	742.0	487.2	25.3	215.8	1279.9	287.8	234.9	402.9	466.1

Notes. The source is FAO's database.

[a] Information on the quantity of imports is not available for 1988 and 1989 so the average refers to 1985-1987.

Table 6.1 also reports data on official exports of maize, which are handled by the GMB. Except for the years 1980, 1984 (not reported) and 1992, Zimbabwe exported large amounts, and it can be considered a net exporter of maize. To give a picture of the relative importance of maize exports, the export-to-production ratios are plotted in

[14] The GMB can temporarily allow private companies to import and export maize.

Fig. 6.1. During drought years about 5% to 15% of the harvest were exported, and during good years the share passed 30%. These figures are surprisingly high, considering that harvests often are claimed to be too small to satisfy domestic demand. For instance, during the crisis years 1997 and 1998 roughly 20% and 35%, respectively, were exported. To some extent this probably reflects GMB's need to fulfil already entered export contracts. It could also be a question of fluctuations in domestic supply during a particular year, with excess supply during the harvest season and shortages at the end of the year and in the beginning of the next. Another explanation for the large exports could be problems with the data; for instance, transit trade might be included in the statistics. However, it is also likely that exports are underestimated for certain years because of unregistered informal trade. Nonetheless, the data do seem to indicate that the GMB is very willing to export maize, probably to make profits and reduce storage costs.

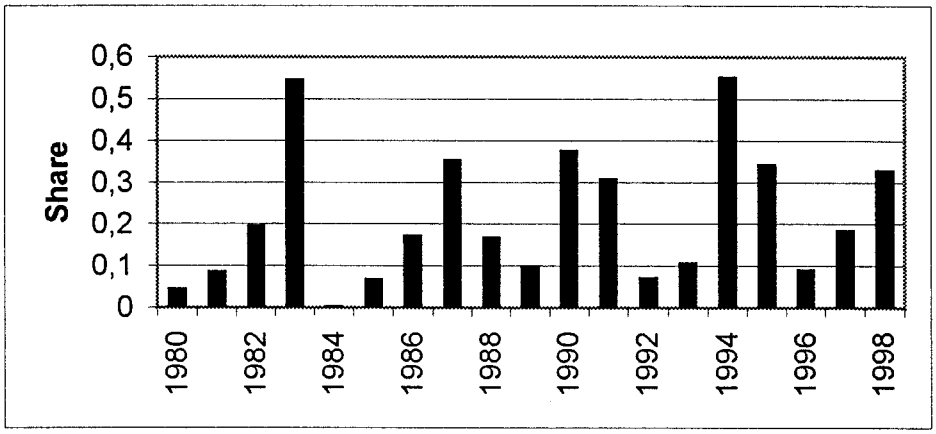

Figure 6.1. Exports of maize as a share of total production.

Average prices for imports and exports of maize, world maize prices, represented by the price at the Chicago Board of Trade, domestic producer prices, and the ZIMACE price are reported in Table 6.2. To facilitate comparisons, all prices set in Zimbabwe dollars have been converted to US dollars. As expected, import prices are much higher than export prices during most years, a reflection of the high transport costs. On average, they are about 60% higher, excluding the year of 1994 when the import price appears to be unreasonably high. It is notable that the export price was actually higher than the import price during one year. This was in 1992, when the whole region was hit by one of the worst droughts ever.

By comparing import prices with the price of maize set in the US, we get an idea of the importance of transportation costs, as well as other transaction costs. Import prices are in general twice as high as the price in the US. Currently transporting a tonne of maize is estimated to cost about $US 25-30/ton from the Gulf to Beira, and $US 70-80/ton from Beira to Harare. This implies that food security, in the form of stable maize prices, probably could be improved considerably by reducing regional transportation costs.

In general, producer prices have been well below the world price, and thus much lower than export prices. Only during one year, 1994, did local producers receive a higher price than the world market price. During 1997 and 1998 producer prices were very low. This partly depended on the rapid depreciation of the exchange rate, in combination with the

decline in the importance of pan-seasonal pricing of the GMB, who by then had started to set a floor price of maize. However, in practice many farmers were probably paid more than the floor price.15 For instance, maize growers that had access to the ZIMACE could receive a price close to the world market price during these years, as shown in the bottom row of Table 6.2. Almost all of these farmers were in the commercial sector since the ZIMACE price is for maize delivered in Harare and the minimum quantity traded is five tonnes.

Table 6.2 International Maize Prices (US dollars per tonnes)

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Import price	224.1	208.8	197.0	197.2	628.8	310.2	203.2	236.9	202.5
Export price	146.8	108.7	359.9	145.5	114.7	117.1	151.1	125.4	111.6
World price	95.3	91.3	90.6	89.0	94.5	102.8	149.2	103.9	86.6
Producer price	81.7	45.0	48.6	77.0	108.0	99.0	94.5	60.0	36.0
ZIMACE price	-	-	-	-	-	-	127.9	84.7	98.1

Note: The export and import prices were taken from FAO's database, They were calculated by dividing the values of the exports and imports with their respective quantities. The world price is the Chicago Board of Trade price on yellow maize, taken from the IFS database. Producer prices are from the GMB, and the ZIMACE prices were provided by the ZIMACE.

It might appear to be socially preferable to artificially keep producer prices below export prices because of high international transport costs, as government has done in the past. Yet, this might not be a good strategy. With low producer prices, exports become profitable for some economic agents but not for Zimbabwe as a country. One result could be that the GMB exports maize grain to make profits, as it did during 1998 (see Muchero 1998), creating shortages and price increases in the domestic market for maize meal. Another consequence is that large amounts of maize (meal) might be exported illegally since prices are likely to be higher in neighbouring countries. This, in conjunction with low domestic supply due to controlled maize prices, can be very costly for Zimbabwe in terms of the welfare of its people.

Yet another aspect that should be considered when discussing price policy is that liberalisation has created restrictions on the pricing of maize. Prices on inputs used in maize production, such as fertilisers, pesticides, fuel, and seeds are now more influenced by world prices than during the old regime with import and price controls. This means that unless productivity starts increasing, domestic prices need to grow in line with input prices in the future. If they do not, profits from maize production will decline and both commercial and communal farmers will switch to other crops.

One conclusion from this review on trade is that it seems as if Zimbabwean farmers still supply its population with sufficient amounts of maize, in spite of the decline in per capita production (reported in Section 3). If the GMB keep buffer stocks of a minimum of 500 000 ton, it should be able to smooth out variations in the supply during most years without recurring to expensive imports. Actually, the only time during the last 18 years when it would have had to import was in 1992. A revision of the functioning of the GMB thus appears to be required. It is also worth exploring in detail the establishment of a

[15] It is also likely that some smallholders received less than the floor price because of lack of information or competition among private traders.

regional market for white maize. Most countries in southern and eastern Africa face problems that are similar to the ones of Zimbabwe, and they constitute a significant welfare cost. Regional integration of the various maize markets would smooth out fluctuations in supply during most years since the common situation is that there are surpluses in some countries and deficits in others. The reason is that the fluctuations in domestic production are mainly due to variations in rainfall, and drought seldom occurs in the whole region at the same time.

7. POLICY DISCUSSION AND SUMMARY

The purpose of this paper has been to discuss several aspects of production and trade of maize and maize meal, with a particular emphasis on the effects of economic reforms. Initially, deregulation of the maize meal market seemed to be a success as marketing and processing costs declined, offsetting the negative effects of the removal of subsidies (Jayne and Jones 1997). Nonetheless, macroeconomic shocks and currency crisis during 1997 exposed some of the weaknesses of the current system when maize meal prices, as well as several other basic food prices, rose rapidly. This led to riots, and a re-introduction of price controls on maize meal in the beginning of 1998. According to Government the millers had exploited the current instability by colluding to raise prices by more than what was motivated by the increase in costs, partly with the purpose of creating political turmoil. Hence, the difficult process of liberalisation of the maize and maize meal markets has only begun, and there are a number of unsolved problems that the authorities will have to deal with during the coming years.

One of the main reasons why it is difficult to ensure a sufficient supply of maize at stable prices is its characteristic of a low-value and bulky commodity, making transportation costs high in general. For Zimbabwe, a landlocked country surrounded by countries with insufficient infrastructure, transportation costs are particularly high. As a consequence, domestic and import prices of maize usually differ a great deal. This gives domestic production of maize a central role in ensuring food security. Yet, since Independence per capita production of maize has declined; production in tonnes has been more or less constant while population has grown. This trend probably explains part of the increase in the relative price of maize meal during the 1990s, and it will continue to generate higher prices in the future unless there is an increase in production or a switch in consumption to other food stuffs.

There are basically two reasons for the stagnation in maize production. First, there has been little expansion in the total area planted with maize. Second, overall there has been no growth in yield per hectare planted. Although there was a significant one- time increase in land productivity in the communal areas during the 1980s, it was more than offset by a reduction of maize production on commercial farms that have much higher output per hectare. Moreover, there are no signs of increased land productivity as a result of the agricultural reforms. Maize production thus differs from tobacco where productivity seems to have been increasing continuously since the 1970s.

The main explanation for the slow growth in area planted is probably sluggish development of maize prices relative to prices of inputs, other crops and consumer goods.

Hence, maintaining a low producer price of maize by government intervention is likely to affect maize supply negatively. Another factor that seems to have influenced planting of maize negatively during the 1980s is policy measures aiming at increasing agricultural diversification. Apart from these factors, the speed of implementation of land reform is also likely to affect the size of the area under maize cultivation. The reason is that smallholders use relatively larger areas of land for maize cultivation than commercial farmers do. However, land reform has been slow since the mid-1980s, and although government has attempted to speed it up recently it is not clear what the result will be. In any case, the prospects for a rapid, but transparent, re-distribution of land that leads to an increase in total maize production are not very good. One measure that the government could take to quickly increase the supply of maize is to make the major agricultural parastatal, ARDA, grow maize as part of a food security strategy. This has been suggested by Ndlela et al. (1999), and merits a detailed analysis.

The explanations for the lack of productivity growth are not as straight forward. In the short run, weather conditions account for almost all variations in land productivity. For smallholders, the empirical evidence also indicates that the number of depots and collection points are important. However, it is also clear that the adoption of hybrid maize and improvements in infrastructure, extension services, availability of credit, etc, raised the level of productivity in the communal areas in the 1980s. The current problem is how to raise productivity even more in communal areas; yield per hectare in large-scale commercial farming is already high by international standards and increasing it might require large investments. Since it is well known that productivity in smallholder agriculture can be boosted by intensified input use combined with access to credit and output markets, that is what policies should aim for (Jayne and Jones 1997). Currently there is thus a policy discrepancy since government controls on maize prices keep them low, while input prices are allowed to rise. This is particularly a problem in an inflationary environment where most of the input prices are closely linked to import costs. Rapid inflation sooner or later generates large devaluations that, in turn, lead to increases in prices of fertilisers and other inputs. Since it is unlikely that maize prices are allowed to rise by the same amount, the result is declining use of inputs.

Since people consume maize meal, not unprocessed maize, it is important that the maize meal market functions well. The rapid increase in maize-meal prices during 1997 created suspicion that this might not be the case, and as a consequence government re-introduced price controls. The question is thus if there is sufficient competition in the maize meal sector. In our analysis we found that millers probably have little direct influence over the price of super-refined maize meal (polenta). This is surprising since there are only three producers in Zimbabwe. However, consumers consider roller meal, which is less refined and cheaper to produce, a close substitute to super-refined meal. Therefore, if producers raise the price of super-refined meal too much, consumers stop buying it.

It is more difficult to get a clear idea of the degree of competition in the market for roller meal. The fact that there are many producers - three big milling companies and several hundreds small scale mills - and a close substitute, the hammer-milled whole maize meal that can be produced at a cost of about 2/3 of roller meal, indicates that firms have little market power. Nevertheless, large millers do seem to be able to charge a higher price than the small ones. This could be due to collusion in combination with a segmented market;

the large mills dominate certain urban areas completely. Evidence of this is the fact that in some places, such as Gwanda, average consumer prices have been lower than wholesale prices charged by the big millers for extended periods of time. It is of course possible that large millers can charge high prices because of branding, that is, consumers are willing to pay more for their products because they think it is of better quality. However, maize meal is a homogeneous product and there should be limits to the importance of a strong brand name, particularly in a society with many low-income earners.

Hammer meal is the nearest substitute to roller meal for many consumers. However, in practice it might be difficult to substitute one for the other for urban consumers because of limited availability. To obtain hammer meal you first buy the maize grain and then bring it to the hammer mill. This is time consuming and it could easily take half a day. And since hammer meal only stays fresh for about four to five days, the procedure has to be repeated every week.

There is no doubt that there is competition in the production of hammer meal. The start-up costs in hammer milling are low and usually it is sufficient with one person to do the milling. When the market regulations were removed in 1994 both production and consumption of hammer meal increased significantly, and currently it makes up about half of all maize meal consumed in Zimbabwe. Paucity of data makes it difficult to get any hard facts on recent developments in the industry, however.

When price controls were re-introduced in 1998, the maize meal market was going through a rapid process of structural change. Several new small-scale mills had appeared since the start of the reform in 1994 and the big mills had lost large parts of their market shares. Hence, even though millers might be colluding to maintain high prices, it is certain that the emerging mills were increasing the amount of competition in the market. After all, roller meal is a homogenous product that is easy to produce. One consequence of the price controls was a reduction in profits, and many mills were forced to stop production, at least temporarily. Government intervention thus increased the risk of investing in milling, and this probably benefited the large milling companies in the sense that they have more financial resources than the small ones. Therefore, it is likely that price controls have slowed down, or maybe even stopped, the change towards a more competition in the maize meal market. Controlling prices might be justifiable as a short-run solution, i.e., for a couple of months, to a political problem such as riots. But when controls of some prices are maintained for a year or two in an economy where otherwise most prices are market determined, the cost is high because of misallocation of resources. It is therefore better to adopt a policy that aims at ensuring there is competition in the maize meal market by removing barriers to entry, than controlling prices. Here the newly established Industry and Trade Competition Commission, set up in 1998 as part of the original ESAP proposal, could play an important role. In any case, it is clear that further analysis is necessary before any definitive statements about competition in the maize meal market can be made.

Another issue is the distributional impact of controlling maize prices. Our analysis suggests that if maize meal pricing policy is going to be used as a means to "redistribute income", roller meal is probably not the best food medium. First, increased roller meal prices are likely to hurt the non-poor more than increases of straight run meal prices. Second, the non-poor (rich) consume absolutely more refined meal than the poor do, so the subsidy

on maize meal benefits them. Better targeting can be achieved directly through a social assistance program: vouchers, targeted cash payments to the poor, in-kind transfers etc. Whatever the approach, the choice should be based on the current social assistance system and on future social assistance policies, and should be co-ordinated with food sector objectives.

In Zimbabwe, the GMB has a monopoly on exports and imports and the responsibility to ensure that there is an adequate supply of maize in the local market. Hence, external trade in maize and maize meal has not been liberalised. The official strategy is that the GMB should keep at least 500 000 tonnes of maize in depots as a buffer stock, which is equivalent to about four months domestic consumption. This is expected to keep expensive imports at a minimum level. However, data on international trade reveals that there were fairly large imports of maize during the 1990s. At the same time the GMB exported a significant part of the national crop; for example, 20% and 35% of total maize production were exported in 1997 and 1998, respectively. Considering that there was a shortage of maize in the domestic market during 1998 and that prices skyrocketed, the strategy of the GMB appears to be questionable. Indeed, Zimbabwean farmers seem be able to supply its population with sufficient amounts of maize during most years, and with buffer stocks the GMB should be able ensure a stable supply without recurring to expensive imports.

One of the inherent problems of the maize market is the combination of recurrent weather-induced supply shocks and the large difference between domestic and foreign prices. This could lead to very volatile prices in a completely unregulated market. Since drought effects the external balance negatively, devaluations are likely to reinforce the volatility by pushing up import prices. Hence, there is a role for an agency that stabilises prices in one way or another. One approach that should be explored is to use a system where the agency by market intervention aims at keeping changes in maize prices close to those of the consumer price index. This means that it sells and buys maize to smooth out price changes. It would be preferable that the agency is independent of government, in the same way that central banks are in some developed countries. It should be recognised, though, that in contrast to central banks the agency would incur costs because of the need of keeping stocks and would most likely require government subsidies.

It is also worth exploring in detail the establishment of a regional market for white maize (see Maasdrop 1998 for a discussion). Most countries in southern and eastern face problems that are similar to the ones of Zimbabwe, which are bound to constitute a significant welfare cost. Regional integration of the various maize markets would smooth out fluctuations in supply during most years. The reason is that the fluctuations in domestic production are mainly due to variations in rainfall and usually there are surpluses in some countries and deficits in others. Nonetheless, the possibility of drought in the whole region exists and some stock keeping would be necessary even with an well-integrated regional market.

REFERENCES

Addison, T. (1996) *Zimbabwe: The Impact of Economic reform on Livelihoods and Poverty*, University of Warwick, July.

APAP III Research Report, *Final Evaluation: Zimbabwe Grain Marketing Reform Support Program (613-0233) and the Grain Marketing Reform Research Project (613-0234)*. Sept. 1997, USAID.

Beyond ESAP: Framework for a Long-Term Development Strategy in Zimbabwe Beyond Structural Adjustment Programme (ESAP), (1996) Zimbabwe Congress of Trade Unions, Harare.

Bhalla, A., M.R. Chitiga, R. Davies, J. Kaliyati and R. Mabugu (1999) ZIMBABWE: Globalization, Liberalization and Sustainable Human Development, UNDP/UNCTAD Country Assessment Report.

Breshnahan, T. F. (1989) "Empirical Studies of Industries with Market Power" *Handbook of Industrial Organization, Vol. II*, Eds. R Schalensee and R. D. Willig, Elsevier Science Publishers,

Borenstein, S., Bushnell, J., Wolak, F., (1999). Diagnosing Market Power in California's Deregulated Wholesale Electricity Market. Working Paper PWP-064.

Chimedza, R. (1994) "Rural Financial Markets" in *Zimbabwe's Agricultural Revolution*, Eds. M. Rukuni and C. K. Eicher, University of Zimbabwe, Harare.

Chipika, S. and M. Chisvo (1999) "Economic Reforms and Smallholder Communal Agricultural Development in Zimbabwe" Work Draft, Intermediate Technology, Harare,

Durevall, D., H. Bjurek and T. Godana, (1998) "Structural Adjustment and Productivity: A Study of the manufacturing and Agricultural Sectors in Zimbabwe" Country Economic Report 1998:1, Sida, Stockholm.

Eicher, C. K. and M. Rukuni (1994) "Zimbabwe's Agricultural Revolution: Lessons for South Africa"in *Zimbabwe's Agricultural Revolution*, Eds. M. Rukuni and C. K. Eicher, University of Zimbabwe, Harare.

Government of Zimbabwe (GOZ) (1992), *A Framework for Economic Reform, 1991-1995*, Government Printers, Harare.

GOZ (1994) *Poverty Alleviation Action Plan*, Harare, October.

Hanmer,L., L. Bijlmakers, M.T. Bassett, D. Sanders and G. Chapman (1996) >Social Safety Nets, Who Needs Them? An Analysis of Household Data from Zimbabwe, *Institute of Social Studies (ISS) Working Paper Series no. 211*, February.

Jayne T.S. and S. Jones, (1997) "Food Marketing and Pricing Policies in Eastern and

Southern Africa: A Survey" *World Development*, Vol. 25, No. 9, 1505-1527.

Jayne T.S. and L. Rubey, (1993) "Maize Milling, Market Reform and Urban Food Security: The Case of Zimbabwe" *World Development,* Vol. 21, No. 6, 975-988.

Jayne T.S., L. Rubey, M. Mukumbu, M. Chisvo, P. Santos, M. T. Weber, and P. Diskin (1995) "Effects of Market Reform on Access to Food by Low-Income Households: Evidence from four Countries in Eastern and Southern Africa." *Policy Synthesis*, no. 5, USAID.

Jayne T.S., L. Rubey, M. Chisvo, and , M. T. Weber (1996) "Zimbabwe Food Security Success Story" *Policy Synthesis*, no. 18, USAID.

Jayne T.S. and G. Aergwings-Kodhek, (1997) "Consumer Response to Maize Market Liberalization in Urban Kenya" *Food Policy* 22 (5) 447-458.

Jayne T.S., M. Mukumbu, M. Chisvo, D. Tschirley, B. Zulu, M. T. Weber, R. Johansson, P. Santos, and D. Soroko (1998) "Successes and Challenges of Food market reform: Experiences from Kenya, Mozambique, Zambia and Zimbabwe", paper presented at Strategies for Raising Smallholder Agricultural Productivity and Welfare, Egerton University/Tegemeo Institute of Agricultural Policy and Development, November, 1998, Nairobi Kenya.

Maasdrop, G. (1998) "Regional trade and food security in SADC" *Food Policy*, Vol. 23, No. 6, 505-518.

Mabeza-Chimedza, R. (1998) "Zimbabwe's smallholder agriculture miracle" Food Policy, Vol. 23, No. 6, 529-537.

Mabugu, R. (1999) ZIMBAWE: Assessing the overall Resource Envelope for Social Safety Nets, Report prepared for Ministry of Public Service Labour and Social Welfare, Harare.

Marquette, C.M. (1997) >Current Poverty, Structural Adjustment, and Drought in Zimbabwe=, *World Development*, Vol.25, No.7.

Mashingaidze, K. (1994) "Maize Research and Development" in *Zimbabwe's Agricultural Revolution*, Eds. M. Rukuni and C. K. Eicher, University of Zimbabwe, Harare.

Ministry of Public Service, Labour and Social Welfare (MPSLSW) (1996) *Poverty Assessment Study Survey: Preliminary Report*, Social Development Fund Unit, Harare.

MPSLSW (1996) *Social Trends under Structural Adjustment: a Comparative Analysis of Sentinel Surveys in Zimbabwe*, July.

Ministry of Lands and Agriculture (MOLA) *The Agricultural Sector of Zimbabwe:*

Statistical Bulletin, various issues, Harare.

Muir-Leresche, K., (1998) "Agriculture and Macroeconomic Reforms in Zimbabwe: A Political-Economic Perspective" TMD Discussion Paper No. 29, IFPRI, Washington.

Muchero, M. (1998) "The Role of GMB in Between these Interests" in *Staple Food and Producer Prices: Whereto Do They Go?* Seminar Proceeding (17), Friedrich-Ebert-Stiftung, Economic Advisory Project, Harare.

Ndlela, D., G. Kanyenze, and J. Munemo (1999) " A Review of Pricing Policy in a Liberalised Enviroment in Zimbabwe: The Case of Basic Commodities" A consultancy study on the behalf of the National Economic Consultative Forum Taskforce on Prices and Incomes, (Harare).

Rubey, L. (1993) "Market Reform and the Development of Alternative Maize Marketing Channels" Working Paper AEE 5/93, Department of Agricultural Economics and Extension, (Harare).

Rukuni, M. and C. K. Eicher, Eds. (1994) *Zimbabwe's Agricultural Revolution*, University of Zimbabwe, Harare.

Thirtle, Colin; et al. (1993) "Agricultural Productivity in Zimbabwe, 1970-90" *Economic Journal*, Vol. 103, No. 1.

Tobaiwa, (1998) "Analysis of Price Increases on Basic Food Commodites" in *Staple Food and Producer Prices: Whereto Do They Go?* Seminar Proceeding (17), Friedrich-Ebert-Stiftung, Economic Advisory Project, Harare.

World Bank (1995a), *Zimbabwe: Consolidating Trade Liberalization, 1995*, Washington DC.

World Bank (1995b) *Zimbabwe: Achieving Shared Growth*, Country Economic memorandum, Vol.1, Washington DC.

World Bank (1991) *The Informal Sector in Zimbabwe: The Role of Women*, Report no. 9006-ZIM, Washington DC.

Country Economic Reports

Nicaragua 1995: A New Door Might be Opened	1996:1
Tanzania 1995: Ten Years of Economic Reform	1996:2
Laos 1995: Labour Market Adjustment and Human Resource Mobilization	1996:3
Lesotho 1995; Lesothoɔs Strategic Economic Options: Towards Closer Integration	1996:4
Guinea Bissau 1995: Missing the Beat	1996:5
Vietnam 1995: Sustainable Growth and the Issue of Capital	1996:6
Kenya 1995: Hesitant but Back on Track	1996:7
Zimbabwe 1995: Domestic and External Debt in Zimbabwe	1996:8
Vietnam 1996: Approaching The Next Stage of Reforms	1996:9
Tanzania 1996: The Impact of Balance of Payment Support	1996:10
Angola 1996: Hyper-Inflation, Confusion and Political Crisis	1996:11
Eritrea 1996: A Peaceful Struggle for Sustained Independence	1996:12
Laos 1996: One Step Back or One Step to the Side?	1996:13
Kenya 1996: Economic Reforms and Impediments to Growth	1996:14
Uganda 1996: Security, Credibility and Market Development	1997:1
Guinea-Bissau 1996: Looking for New Development Paths	1997:2
The South African Economy in 1996: From Reconstruction and Development to Growth, Employment and Redistribution	1997:3
Vietnam 1997: Managing the Transition to Free Trade: Vietnamese Trade Policy for the 21st Century	1997:4
Ethiopia 1996: Government legitimacy, Aid and Sustainable Development	1997:5
Vietnam 1997:2 Small, Medium, or Large?	1997:6
Tanzania 1997 The Urge to Merge: The Revival of East African Cooperation	1997:7
Laos 1997: The Poor and the Rich	1997:8

Country Economic Reports

Zimbabwe: Structural Adjustment and Productivity: A Study of the Manufacturing and Agricultural Sectors	1998:1
Uganda: Towards Results-Oriented Economic Management?	1998:2
Ethiopia: Regional and Business Sector Challenges	1998:3
Kenya: From Chaos to Prosperity?	1998:4
Angola: More Oil and Financial Problems	1998:5
Guinea-Bissau: Going into High Gear	1998:6
Cape Verde: The Economics of Mudança	1998:7
Vietnam and the Asian Crisis: Causes, consequences and cures	1998:8
Cambodia: The Challenge of Productive Employment Creation	1998:9
Sri Lanka: Institutions, Economic Policies and Economic Growth	1999:1
Tanzania: Cost-Sharing in Development Projects Principles, Practice and Problem	1999:2
Mozambique in a Post-Washington Consensus Perspective	1999:3
Moçambique: Numa Perspectiva do Consenso Pós-Washington	1999:3
Kenya:Economic Reorms with Labour Market Rigidities; The Kenya Experience	1999:4
Uganda: Uganda at the End of the 1990s: A Medium-Term Assessment	1999:5
Zimbabwe:Employment, Labour Market Reform and Trade Liberalisation Zimbabwe 1990-1997	1999:6

Country Economic Reports

Mozambique: Dutch Disease in Mozambique?	**2000:1**
Rwanda: Rwanda Looking Ahead: Reconciliation, reform and Regional Stability	**2000:2**
Sri Lanka: Dispersed Industrial Pattern for Reducing Poverty and Regional Inequality in Sri Lanka	**2000:3**
Tanzania: Tanzania 1999: Obstacles to Private Sector Growth	**2000:4**
Eritrea: Eritrea 1999: A bleeding country that never kneels down	**2000:5**
Moçambique: Doença Holandesa Moçambique?	**2000:6**
Laos: Emerging Rice Market in Laos?	**2000:7**
Cape Verde: Putting New Life Into Reform Policy, and then…	**2000:8**
Cabo Verde: Dando Vida Nova à Política de Reformas, e depois…	**2000:9**
Zimbabwe: Maize Markets in Zimbabwe	**2000:10**

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
S-105 25 Stockholm, Sweden
Tel: +46 (0)8-698 50 00. Fax: +46 (0)8-20 88 64
Homepage: http://www.sida.se

ISBN: 91-586-8933-8
ISSN: 1404-031X