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Staple food prices in Malawi



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1 Introduction

Malawi is a small, densely populated country in southern Africa. The population is 13.1 million, according to the preliminary results of the 2008 Census. Thus, the population is slightly greater than that of Zambia but less than its other neighbors. The population density is 110 inhabitants per square kilometer, compared to an average of 34 per km² for sub-Saharan Africa. Malawi ranks sixth in population density among African countries.

The altitude ranges from 30 meters above sea level in the Lower Shire Valley in the south to 3000 m above sea level in the mountainous north. Most of the country, however, is above 600 m, giving it a moderate climate in spite of the tropical latitude.

Annual rainfall ranges between 800 and 1400 mm in most areas of Malawi. The rain is strongly seasonal and follows a unimodal pattern, with almost all the annual rainfall occurring between November and April.

Agriculture accounts for about one third (34%) of gross domestic product, a higher percentage than in most of the other countries in eastern and southern Africa. Maize is the most important food crop, followed by cassava, sweet potatoes, and sorghum. The dominant export crop is tobacco, grown both by small-scale farmers and on large estates. Other important cash crops are sugarcane, tea, cotton, and coffee, produced mainly by estates. Agriculture contributes 90% of the export revenue of Malawi (World Bank, 2009).

2 Importance of staple foods in the diet

Maize is by far the most important food staple in Malawi. Per capita consumption of maize is 133 kg, and it accounts for over half (54%) of the caloric intake of households in Malawi. Among the countries of eastern and southern Africa, only Zambia is more dependent on maize as a source of calories. For other countries in the region, maize generally contributes 20-35% of the caloric intake. Thus, it is not surprising that maize is the focus of food security policy in Malawi. Cassava and sweet potatoes are also important staple food crops in Malawi. Cassava contributes 7% of total caloric intake, while sweet potatoes and potatoes contribute 8% (see Table 1). In addition, being more drought-resistant than maize, cassava and sweet potatoes become particularly important in low-rainfall years.

Rice and wheat products together contribute less than 4% of caloric intake, but they are the preferred staples among urban and high-income households. In contrast, cassava is

Figure 1. Map of Malawi



considered a poor man's crop, and consumption is concentrated in the cassava growing regions of the country.

Table 1. Importance of staple foods in diet of Malawi (2003)

Commodity	Quantity consumed (kg/person/year)	Daily caloric intake (kcal/person/day)	Share of caloric intake (percent)
Maize	133	1154	54%
Cassava	89	161	7%
Potato*	88	163	8%
Others		647	31%
Total		2125	100%

Source: FAO, 2009a

* FAO data combine potato and sweet potato.

3 Production and trade of main staple foods

This section describes the production and trade patterns of the main staple foods in Malawi: maize, cassava, and sweet potatoes. Production and trade patterns determine whether prices are determined by international markets or local supply and demand. For widely traded commodities, the price is largely determined by international prices, trade policy, and transportation costs from the port to various markets in the country. On the other hand, for commodities that are not widely traded, prices will depend largely on local supply and demand. Since demand is relatively stable over time, fluctuations in the price of non-tradables is largely determined by weather-related fluctuations in production.

3.1 Maize

As shown in Table 2, Malawi produces about 2.4 million metric tons of maize per year. The actual harvest in a given year varies significantly depending on the weather, but this is the average production over 2005-07. During this time, exports and imports have been quite small relative to production. Imports averaged 63 thousand tons, or 3% of apparent consumption, while exports were less than 6% of production. Thus, it is clear that in general, maize is a non-tradable crop in Malawi so prices are determined largely by domestic supply and demand.

Table 2. Production and trade of food staples in Malawi

Commodity	Production (1000 tonnes)	Imports (1000 tonnes)	Exports (1000 tonnes)	Imports as a percentage of apparent consumption (percent)	Exports as a percentage of production (percent)
Maize	2,354	63	131	2.8%	5.6%
Cassava	2,756	0	0	0.0%	0.0%
Potatoes*	2,218	0	0	0.0%	0.0%

Source: FAO, 2009b

Note: The data used are average of 2005, 2006 and 2007

Apparent consumption refers production plus imports minus exports.

* FAO data for "potatoes" probably refer to sweet potatoes.

However, in years with a poor harvest, Malawi has imported maize from northern Mozambique and South Africa. Over the past four years, Malawi has had a series of good harvests, leading to a surplus for export to Zimbabwe and other neighboring countries. In 2007, Malawi exported several hundred thousand tons to Zimbabwe through government-to-government contracts. In September 2009, the government announced it would export 40 thousand tons of maize to Kenya and Zimbabwe.

Nationally, 54% of the small-farm area is planted with maize (NSO-IFPRI, 2002). Figure 2 shows the proportions in different parts of the country. In most areas, over half the small-farm land is allocated to maize.

More than 75% of the land is planted with maize in a few places, including the area north of Nkhata Bay on Lake Malawi and the southern shore of the Lake. The white areas of the map correspond to national parks and game reserves. Overall, 97% of Malawi farmers grow maize, the share being over 95% in almost all districts (NSO, 2005).

The main maize harvest is from April to July, though green maize is harvested in February and March. Thus, the period of greatest food insecurity is December and January.

3.2 Cassava

According to FAO statistics, cassava production in Malawi has grown dramatically, rising from about 300 thousand tons of fresh root in the mid-1990s to over 3.3 million tons in 2007. As shown in Table 2, cassava production over 2005-07 averaged 2.7 million tons. Some have questioned these statistics since 3.3 million tons would imply 250 kg per capita, which seems high unless a large share of production is going to feed and industrial use.

Nationally, 6% of the small-farm area is allocated to cassava production (NSO-IFPRI, 2002). Figure 3 shows the proportions in different areas of the country. Unlike maize, cassava

Figure 2. Share of small-farm area in maize

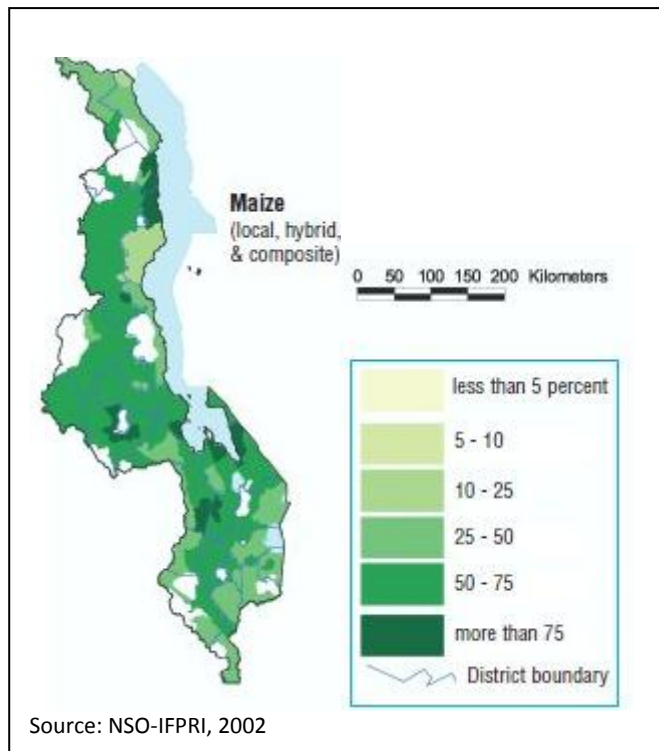
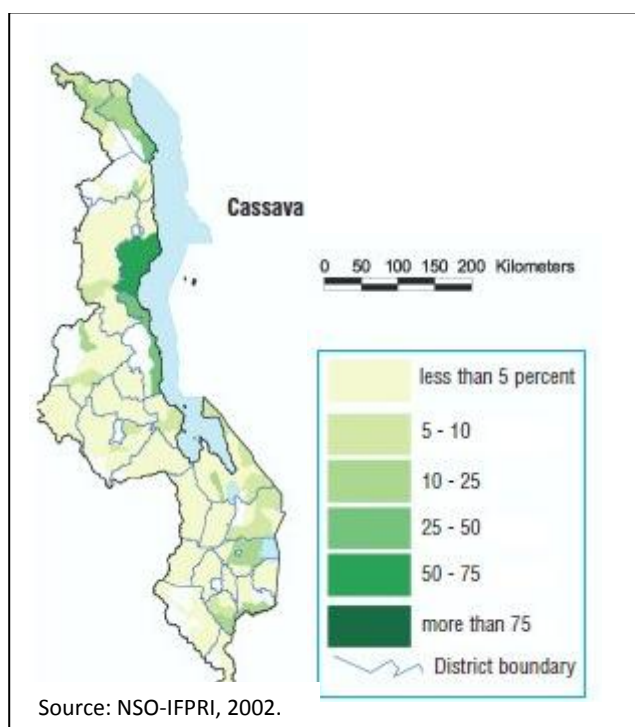


Figure 3. Share of small-farm area in cassava



production is highly concentrated along the central shore of Lake Malawi in the districts of Nkhata Bay. Here, over 75% of the smallholder area is allocated to cassava production. Other important cassava areas are along the shore of Lake Malawi, in the districts of Nkhotakota (south of Nkhata Bay) and Karonga (north of Nkhata Bay). In most of the rest of the country, cassava accounts for less than 10% of the total area planted by smallholders.

According to Kambewaa and Nyembe (2008), farmers in the cassava belt grow it mainly for home consumption, marketing less than 10% of production. They tend to grow the bitter variety. After harvest, it is washed, peeled, and soaked in water for several days to ferment it. Then it is dried and pounded or milled into flour (*kondowole*). Cassava is consumed as a staple throughout the year in this area.

Farmers in the center and south, on the other hand, tend to grow the sweet variety, which is produced into dried cassava chips (*makaka*) without fermentation. Cassava in these areas is more often grown commercially, particularly near the cities. Cassava consumption here is more seasonal than in the cassava belt, being greatest from November to March when maize is less available. Cassava is also sold fresh for consumption at home and boiled or fried for snack food. Small quantities (1-2%) of cassava are used for starch and other industrial purposes (Kambewaa and Nyembe, 2008).

According to the FAO, Malawi has virtually no trade in cassava with its neighbors (see Table 2), but Kambewaa and Nyembe (2008) report that Mozambique is a source of cassava supply for Zomba and Blantyre.

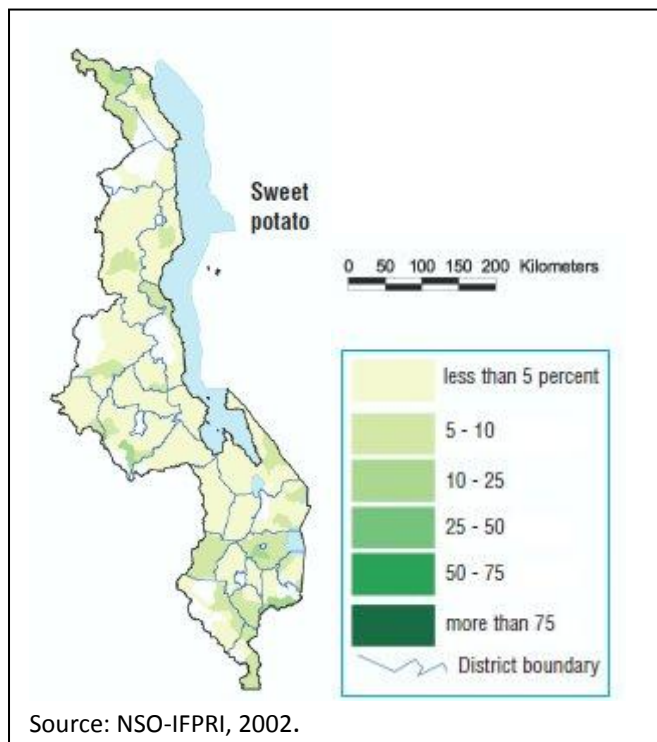
3.3 Sweet potatoes

Both sweet potatoes and white potatoes are grown in Malawi, but sweet potatoes are much more important. According to NSO-IFPRI (2002), sweet potatoes occupy about 5% of the area cultivated by small-scale farmers.

Figures for white potatoes are not given, the area being included in the 2% for “other crops.” As shown in Figure 4, sweet potatoes are grown throughout the country, though the share of the small-farmer area allocated to this crop is generally less than 25%. Centers of sweet potato production are in the south, near Zomba, and in the extreme north.

According to FAO-WFP (2005), 46% of sweet potato production comes from two of the eight Agricultural Development Divisions (ADD), Blantyre and Machinga, both in the south. In contrast, almost two thirds of white potato production comes the Lilongwe ADD, mostly the highland Dedze district.

Figure 4. Share of small-farm area in sweet potatoes



According to FAO-WFP (2005), sweet potato production grew from 200 thousand tons in 1993/4 to 1.7 million tons in 2003/4, while white potato production remained below 500 thousand tons in 2003/4.

FAO production statistics appear to combine sweet potato and white potato production under the category “potato” (FAO, 2009b). According to this source, production was around 60 thousand tons in the 1960s and grew slowly until the 1990s. Since the mid-1990s, it expanded rapidly, rising from about 400 thousand tons to almost 2.9 million tons in 2007. Malawi is now the largest producer in sub-Saharan Africa.

Sweet potatoes are generally planted with maize and beans during the main planting season between October and March. In some areas, a second crop can be planted in July using residual moisture for harvest in September.

4 Staple food price patterns

In this section, we examine the patterns and trends staple food prices in Malawi. The focus is on maize but some information on cassava prices is also provided.

4.1 Maize prices

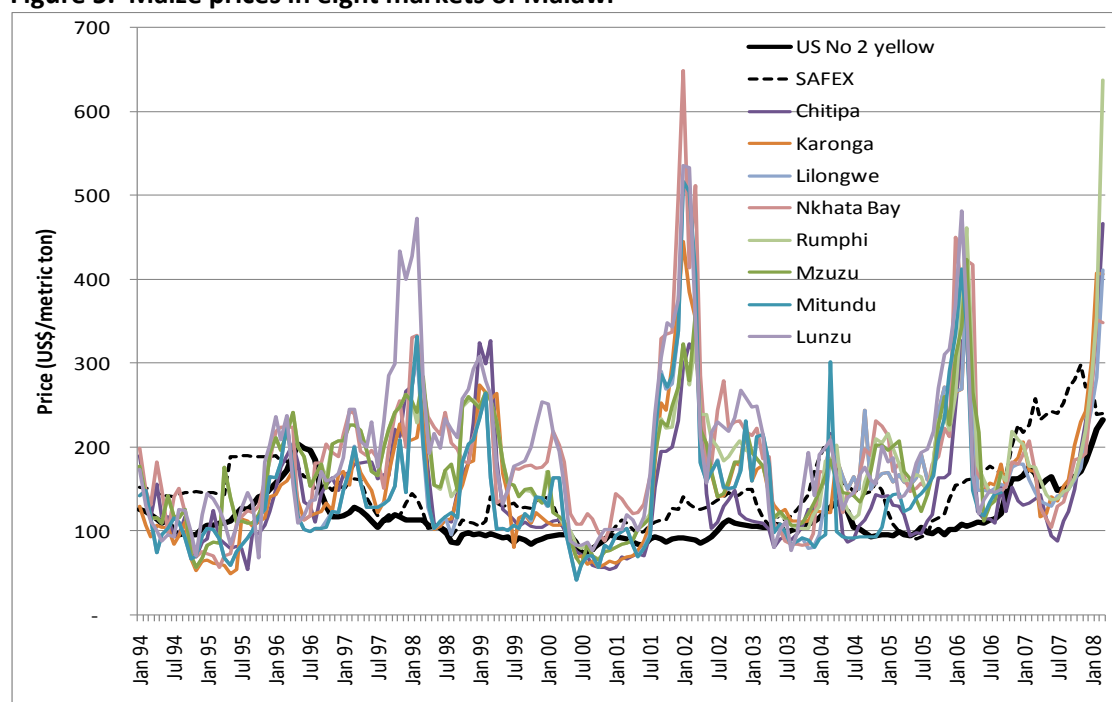
As mentioned above, maize is the dominant food staple in Malawi, being cultivated by 97% of the farmers, occupying 54% of the land cultivated by small-scale farmers, and contributing 54% of the caloric intake on average (NSO, 2005; NSO-IFPRI, 2002; and FAO, 2009a). We examine monthly wholesale price data from eight markets over 1994-2008. Below is a brief description of the eight markets:

- Chitipa is in the extreme northern corner of Malawi. It is located in a mountainous area at 1250 m. It is near the borders with Zambia and Tanzania, facilitating occasional maize imports from southern Tanzania.
- Karonga is also in the far north, about 80 km southeast of Chitipa, on Lake Malawi (see Figure 1). The area is part of the cassava belt, though maize production is also widespread there.
- Rumphi is located south of Karonga and inland. It is located near two national parks and tobacco growing areas.
- Mzuzu is the third largest city in Malawi and the capital of the Northern Region. It is located inland, southeast of Rumphi (see Figure 1)
- Nkhata Bay is on Lake Malawi, southeast of Mzuzu (see Figure 1). This is the center of the cassava belt where more than 75% of the farmers grow cassava.
- Lilongwe is the capital and largest city in Malawi, with a population of about 800,000. It is located south of Nkhata Bay in the Central Region (see Figure 1).
- Mitundu is a market town on the outskirts of Lilongwe, in central Malawi.
- Lunzu is on the outskirts of Blantyre, the second largest city, located in southern Malawi (see Figure 1).

Figure 5 shows maize price trends for eight markets in Malawi over the period 1994-2008, converted to US dollars, along with US yellow maize price and the South African white maize price. Several patterns can be identified from this graph:

- Maize prices in Malawi are generally higher than those in US and South African. For some markets in some months, the Malawi prices are four times higher than the international price.
- Maize prices in Malawi are much more volatile than international prices. In fact, they are more volatile than the maize prices in many other African countries. Chapoto and Jayne (2009) calculate the coefficient of variation for the capital cities of eight countries in eastern and southern Africa and find that Malawi has the largest volatility among them.
- Most of the maize prices in Malawi follow a common pattern with some variations. For example, the spikes in January 1998, February 2002, February 2006, and March 2008 occur in most or all of the eight markets in Malawi.
- A seasonal pattern can be discerned, given that the peaks tend to occur in January, February, and March.

Figure 5. Maize prices in eight markets of Malawi



The main price spikes occurred in the early months of 1998, 2002, 2006, and 2008. The first three spikes are understandable in light of the maize production data presented in Table 3. Relative to the previous year, maize production fell 25% in 1997, 32% in 2001, and 24% in 2005. When the harvest is below average in a given year, the price spikes tend to occur early in the following year when stocks are depleted before the next harvest. In addition, each of these price spikes corresponds to a year with imports of more than 200 thousand tons, either in the planting year or the harvest year.

It is somewhat surprising that the largest drop in maize production occurred in 1994, yet prices in early 1995 were normal or even below average. One possible explanation is that 1994 also had the largest maize imports (389 thousand tons) in the period under consideration. Another anomaly is that the 2007 harvest was above average, yet prices rose

dramatically in late 2007 and early 2008, corresponding to the global food crisis. This period is discussed further below.

Table 3. Maize production and trade in Malawi

Year	Production (1000 tons)	Percent change	Imports (1000 tons)	Exports (1000 tons)
1994	1,040	-49%	389	1
1995	1,661	60%	235	3
1996	1,793	8%	83	0
1997	1,352	-25%	54	1
1998	1,772	31%	319	0
1999	2,479	40%	28	0
2000	2,501	1%	8	11
2001	1,713	-32%	9	10
2002	1,557	-9%	348	2
2003	1,983	27%	62	55
2004	1,608	-19%	54	13
2005	1,225	-24%	113	0
2006	2,611	113%	56	1
2007	3,226	24%	20	391

Source: FAO, 2009b.

Figure 6 shows the average price for each month of the year, allowing us to more easily identify the seasonal pattern and the average level of prices in each market. The lowest maize prices are in Mitundu (outside of Lilongwe), Lilongwe, and Chitipa (in the extreme north). The prices in Lilongwe and Mitundu are low because these markets are located in an important maize-growing region of the country (see Figure 2). Chitipa is a highland region not known as a surplus maize zone. The low maize prices in Chitipa may be related to the inflow of maize from the southern highlands of Tanzania. On average, the maize prices in Songea (southern Tanzania) are among the lowest in eastern and southern Africa (see Minot, 2009).

The highest maize prices are in Lunzu and Nkhata Bay. Lunzu is on the outskirts of Blantyre, the second-largest city in Malawi, in the Southern Region. Although almost all farmers grow maize in this region, the population density in southern Malawi is higher than in the north, so the average farm size is even smaller than the national average. Since southern Malawi is considered the food deficit region, it is not surprising that maize prices are high. Nkhata Bay, in the north on the Lake, is the center of the cassava belt. Over 90% of the farmers in this district grow cassava. Although 66% of the farmers grow maize, this is lowest percentage of all 30 districts in Malawi. For this reason, it seems likely that Nkhata Bay is a maize deficit district, drawing maize from surplus zones with high prices.

With the exception of Lunzu and Nkhata Bay, maize prices in the other six markets tend to remain within US\$ 30-40 per ton of each other. Assuming a transfer cost of US\$ 0.10 per km-ton, this would cover the cost of moving a ton of maize 300-400 km.

Figure 6. Average maize price in different markets by month

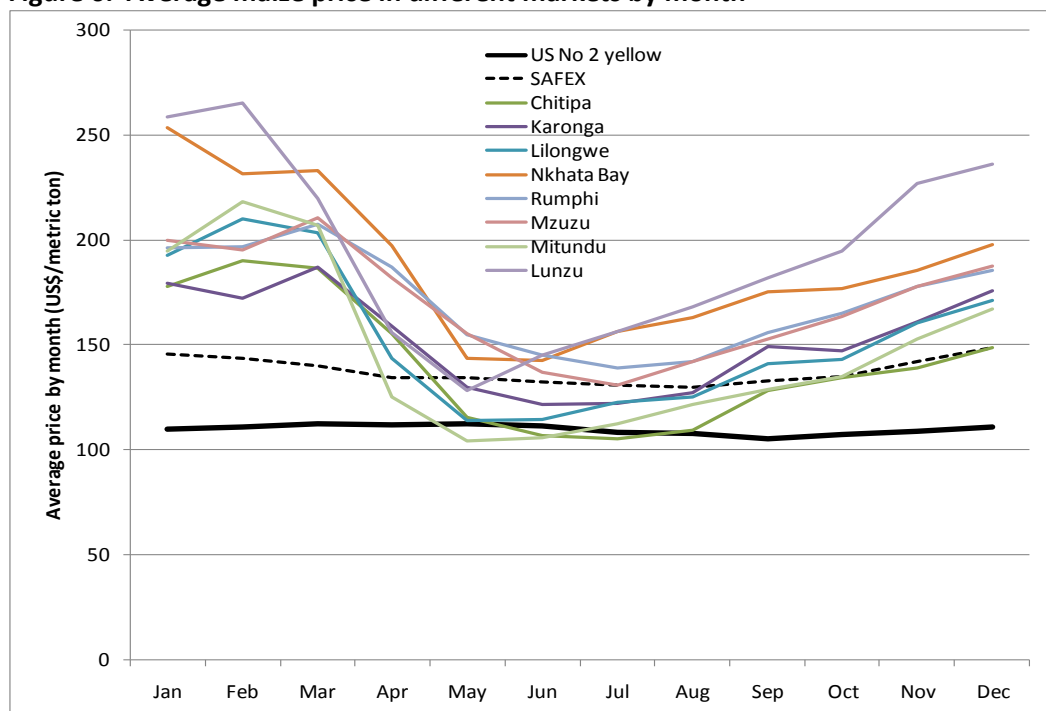
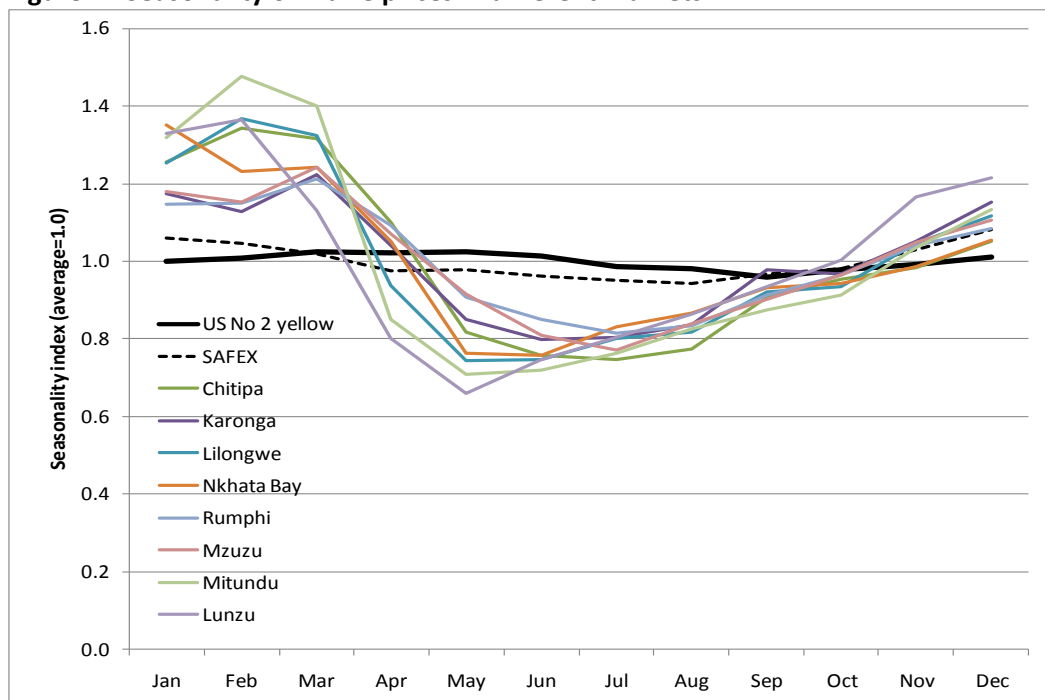


Figure 7 shows the seasonality index, calculated as the average price for the month divided by the average overall price. Maize prices fall sharply in April as the rains end and green maize comes on the market. They reach the lowest level in June and July when the main maize harvest comes to market. After the harvest, they rise slowly throughout the second half of the year, reflecting the cost of storage.

However, the seasonal patterns vary somewhat by region. Maize prices fall earlier in Lunzu, Mitundu, and Lilongwe than they do in the northern markets. Prices in these three markets bottom out in May, while prices in the northern markets reach their minimums in June and July. This reflects the different cropping calendar with earlier harvests in the center and south.

A simple measure of seasonality is the ratio of the highest monthly price to the lowest. Across the eight markets, the average ratio is 1.78, but there are important regional differences. The ratio is less than 1.55 in the cassava-growing zones of Karonga and Rumphi, but above 2.00 in the Mitundu (near Lilongwe) and Lunzu (near Blantyre). This may be due to the fact that cassava is more available in the north than in the center and south; where consumers have an alternative, they are less likely to bid up the price of maize. Alternatively, cassava availability may be the same, but consumers may be more flexible in their food choices. With cassava as part of their regular diet, northern consumers may more easily switch when maize prices rise a little, while southern consumers resist, bidding up the maize price. In economic terms, consumers in the south may be more price-inelastic in their maize demand.

Figure 7. Seasonality of maize prices in different markets



4.2 Cassava price

Kambewaa and Nyembe (2008) provide some information on cassava price patterns. Cassava prices are lowest in Kasungu (Central Region) and Mzuzu (Northern Region), intermediate in Lilongwe (Central Region), and highest in Zomba and Blantyre (both in the Southern Region). This is not surprising given that cassava production is concentrated in the Northern Region. The range of prices is quite extreme, however: during November 2007, the harvest-season cassava price ranged from 4 Malawi Kwacha (MK) per kg in Mzuzu to 16 MK/kg in Zomba, equivalent to a range of US\$ 30 to US\$ 118 per ton. The large spatial variation in price reflects both the cost of transporting a commodity like cassava with a low value-bulk ratio and the fact that fresh cassava is highly perishable.

Cassava prices also follow a seasonal pattern. Much of the cassava harvest comes to market between November and March, when maize supply is low. During this period, cassava prices are low because supplies are plentiful and it is being sourced locally. From April to October, cassava is harder to find and the prices are 30-90% higher.

In November 2007, the price of cassava flour ranged from about 30 MK/kg (US\$ 222/ton) in Mzuzu to double that price in Zomba and Blantyre. In contrast, white maize flour produced by large-scale mills cost somewhat more (52-94 MK/kg) and wheat flour was considerably more (104 MK/kg) (Kambewaa and Nyembe, 2008).

4.3 Spatial market integration

Several studies have examined the spatial integration of food markets in Malawi, that is, the degree to which the prices in different food markets move together. Goletti and Babu (1994) examine the behavior of maize prices in Malawi before and after market liberalizations using cointegration analysis. They use monthly retail data for eight markets over the period 1984-1991, testing the cointegration of each market pair. Before

liberalization, 18 of the 48 market pairs were cointegrated, but after market liberalization 34 pairs were cointegrated. This indicates that the market liberalization in 1987 improved the transmission of price changes from one market to another. On the other hand, they find that the transmission is only partial and can be slow. The average adjustment to an initial shock took 5.7 months. Finally, the study examines the symmetry of adjustment. Asymmetric price adjustment, in which traders pass on advantageous price changes more quickly than disadvantageous one, is one sign of imperfect competition. They find little evidence that increases in maize prices are transmitted any faster or slower than price decreases.

Chirwa (2000, cited in Meyers, 2008) uses cointegration methods to examine maize and rice prices in Malawi. He tests whether markets are cointegrated in the sense of following a common pattern. He finds several of the main markets are cointegrated.

Chirwa and Zakeyo (2006) report on their analysis comparing market integration before and after liberalization in the mid-1990s. They find that integration has improved and the main markets are well integrated, but for more remote markets in the country, the evidence is mixed. They also find that the markets for fully liberalized commodities (bean, rice, and groundnuts) are more integrated than the markets for maize, possibly reflecting continued government intervention in maize marketing and trade.

Meyers (2008) analyzes spatial market integration in Malawi using weekly maize prices from ten markets over the period 2001-2008. He focuses on nine pairs of markets. The price spreads are quite volatile and often turn negative, suggesting that the trade flows are not continuous and that there may even be trade reversals. The study finds strong evidence of a long-run relationship in six of the nine market pairs tested. Half of the full adjustment back to the long-run equilibrium occurs within 1-2 weeks for all market pairs. This adjustment is more rapid than estimated by earlier studies of Malawi maize markets by Goletti and Babu (1994) and Chirwa (2000), suggesting an improvement in market efficiency over time. It is also comparable to the speed of adjustment of maize and soybean markets in the United States, estimated to range between 0.2 and 3 weeks (Goodwin and Piggot, 2001).

Meyers (2008) estimated the threshold above which price transmission occurs ranged from 0.5 Malawi kwacha/kg to 6.4 MK/kg across the nine market pairs studied. For most of the pairs, the threshold estimates appear to correspond with estimates of the marketing cost, but for two pairs, the threshold seem to large given the short distance between the markets.

5 Food price policy

Given the importance of maize in Malawi, it is not surprising that food policy focuses largely on this commodity. Food security is largely defined as access to maize, and maize self-sufficiency is seen as the best strategy for improving access. Some of the main elements of this policy are intervention in food markets by the parastatal Agricultural Development and Marketing Corporation (ADMARC), restrictions on maize trade, and a large fertilizer subsidy program.

5.1 Evolution of food policy in Malawi

The Agricultural and Livestock Marketing Act of 1964 regulated agricultural marketing through various state enterprises. In 1971, these enterprises were merged to form the Agricultural Development and Marketing Corporation (ADMARC), with responsibility for purchasing, processing, and marketing agricultural products; stabilizing food prices; and maintaining food security reserves. Through ADMARC, the government maintain pan-territorial and pan-seasonal prices for maize and other food crops grown by smallholders. Although there was criticism that the system taxed smallholders and favored the export-oriented estate sector, Malawi was generally food self-sufficient and enjoyed healthy rates of economic growth in the 1960s and 1970s.

However, the oil crisis of 1979 and the interruption of trade by the war in Mozambique caused a severe economic crisis in Malawi. The government was forced to turn to the World Bank and the International Monetary Fund for financial support, which entailed agreeing to policy conditions (Chirwa, 2006). Under a series of structural adjustment programs in the 1980s, Malawi carried out reforms to liberalize the economy:

- Over 1982-96, the price bands at which ADMARC would buy and sell were revised annually and moved closer to parity with international prices.
- In 1987, the monopsony power of ADMARC over small-holder food crops was eliminated and private trade was legalized, subject to licensing. The prices of most crops were liberalized, leaving ADMARC in the role of buyer of last resort (Smith, 1995).
- In 1995, the government liberalized the marketing of cash crops. As a result, 20% of smallholders now grow burley tobacco, producing about 70% of the national output (NSO-IFPRI, 2002). Prices of all crops except maize were liberalized.
- In 1997, the licensing requirement for agricultural traders was eliminated, with the exception of those trading in maize.
- In 1999, the National Food Reserve Agency (NFRA) was created to manage emergency food stocks, in theory allowing ADMARC to focus on commercial activities.
- In 2000, ADMARC abandoned the maize price band. With competitive pressure from private traders, it was difficult for ADMARC to defend the maize price floor and ceiling.

Under increasing competition from private traders, the role of ADMARC has diminished markedly. As shown in Table 4, ADMARC's purchases ranged from 38 thousand to 239 thousand tons per year, including 13-198 thousand tons of maize. Between 2000 and 2007, however, the annual volume was 3-83 thousand tons, including less than 10 thousand tons of maize. These figures, however, do not include quantities purchased by the NRFA to maintain a strategic reserve. Recent evolution of food policy, including the operations of the NRFA, are discussed below in sections 5.6 to 5.8.

While the role of ADMARC declined markedly, there is strong political and social pressure to maintain their operations, particularly in remote locations. Jayne et al (2008a) describes the ambivalent feeling of farmers toward ADMARC. On the one hand, they often do not trust ADMARC agents to fairly weigh their maize, and they complain about low prices paid to farmers, late payments, and limited buying schedule. On the other hand, they see ADMARC as keeping the maize in the region, making it available for purchase during the lean season.

Table 4. Quantity of crop purchases by ADMARC

	Total Purchases	Tobacco	Maize	Pulses	Rice	Cotton	Groundnut	Other
	(metric tons)							
1992	78,078	14,596	40,427	8,781	555	13,071	648	0
1993	48,859	6,392	..	5,629	13,547	22,008	1,283	0
1994	37,659	5,573	21,778	3,792	837	2,462	3,217	0
1995	131,260	10,279	87,228	10,638	8,612	12,155	2,348	0
1996	168,660	8,793	96,489	18,054	8,387	35,010	1,927	0
1997	56,518	9,142	12,586	3,839	6,317	15,451	9,183	0
1998	112,771	18,936	57,896	8,807	15,399	7,254	4,479	0
1999	238,607	9,226	198,021	10,792	11,175	7,619	1,774	0
2000	20,125	9,901	0	2,695	8	6,894	619	8
2001	20,230	2,890	2,890	2,890	2,890	2,890	2,890	2,890
2002	5,792	0	0	0	1,125	4,467	200	0
2003	3,158	0	0	0	2,796	0	362	0
2004	10,183	0	7,000	115	2,657	0	411	0
2005	9,765	0	9,097	0	668	0	0	0
2006	83,801	0	75,622	0	8,134	0	44	1
2007	29,487	..	25,542	803	..	0	3,038	104

Source: NSO, 2008.

5.1 Trade policy

As part of the structural adjustment programs, export licensing requirements have been phased out for all food commodities except for maize and cassava. The government regularly bans the export of maize when the domestic price is high or there is some uncertainty regarding the size of the next harvest. As a result, most exports are carried out either by the government as part of government-to-government sales or in the form of cross-border trade.

Import licenses are also required to import maize. When there is a food shortage, the government usually arranges maize imports. Bans on maize imports are rare, but the uncertainty concerning government imports makes private traders reluctant to import maize (Rubey, 2003; Chirwa, 2007). However, when the local harvest is poor, there can be significant cross-border trade, particularly from northern Mozambique and, to a lesser degree, from southern Tanzania. One study estimated that during crisis years, 150 to 250 thousand tons are imported from northern Mozambique (FAO-WFP, 2005). According to FAO statistics, maize imports were over 300 thousand tons during four years over the period 1994-2007.

5.2 Public food stocks

Between 1987 and 1999, ADMARC managed a strategic grain reserve that held a maximum of 80 thousand tons each year. As mentioned above, the Malawi National Food Reserve Agency (NFRA) was created in 1999 to take responsibility for maintaining emergency food stocks. The target of the NFRA is to maintain 30-60 thousand tons of grain to cover localized emergencies until imported grain can be delivered. The stocks are generally between 20 and 60 thousand tons but occasionally they are much higher. In 2000, for example, the NFRA held 165 thousand tons. Although the NFRA is intended primarily to serve emergency needs while imports are arranged, the government has used the NFRA to attempt to stabilize prices (Chirwa, 2006; IMF, 2002).

5.3 Price controls

Until 2000, ADMARC attempted to set maize price band, an upper and lower limit that it would defend by selling or buying maize, respectively. The impact of these policies is debated. Some argue that the quantities were too small to affect market prices, while others argue that ADMARC provided access to maize for rural households in remote areas not well served by markets (Jayne et al, 2008a). Since then, ADMARC has abandoned the maize price band and has been given a more commercial role. However, because of the politically sensitive nature of maize prices, ADMARC continues to be used as a mechanism for the government to influence maize prices.

In August 2008, the government responded to high food prices by banning private trade, followed by “clarification” that private trade was legal provided that traders respected the buying-price ceiling of 52 Malawi kwacha (MK) per kilogram.

5.4 Fertilizer policy

Fertilizer policy in Malawi has involved a series of different types of subsidy programs, with occasionally periods of liberalization. Malawi eliminated fertilizer subsidies in the 1980s, then reintroduced them in 1987. Subsidies were again phased out in the mid-1990s, but reintroduced in 1998 in the form of the Starter Pack program. This program gave all farmers, free of charge, 10–15 kg of fertilizer and small quantities of improved seed. After two years, this program was converted into the Targeted Input Program (TIP), which distributed the packs to a targeted group of farmers, with the percentage of all farming households in Malawi targeted varying between 33 and 96 percent, depending on the year (Levy, 2005).

In 2005, the program was redesigned as the Agricultural Inputs Subsidy Program (AISP), a voucher-based universal subsidy program that allows farmers to buy 100 kg of fertilizer at about one-fifth of the market price, thus dramatically increasing both the quantity of fertilizer being subsidized and the fiscal cost of the subsidy (US\$ 200 million in 2007-08). The expanded input subsidy program is credited with helping Malawi become self-sufficient in maize and has inspired similar programs elsewhere in Africa. However, it has done so by largely displacing the private distribution network. Although the government experimented with allowing fertilizer vouchers to be redeemed at private distributors, this effort has been discontinued and almost all subsidized inputs are now distributed through ADMARC (Dorward and Chirwa, 2008).

5.5 Experience with the 2001-02 food crisis

The rains in 1998-99 were good, leading to a bumper harvest in 1999. The newly formed National Food Reserve Agency built up its stocks to 167 thousand tons, double the usual level. The IMF and the World Bank viewed this as excessive for a strategic reserve stock. A government-commissioned report in 2000 recommended stocks of 30-60 thousand tons. ADMARC (which managed the stock for NFRA) sold almost all the stock in the second half of 2000, depressing maize prices. With lower incentives and poor rains, the 2001 harvest was 32% below the previous year, making it difficult to replenish the stock (see Table 3). The 2001-02 rains were also uneven, indicating a serious shortfall. In late 2001, the government ordered 150 thousand tons of imports, but logistical problems delayed its arrival. In early 2002, the price of maize reached the equivalent of US\$ 500 per ton in Lilongwe and

Blantyre, and the government declared a food emergency. Eventually, food imports and the 2002 harvest brought prices down, but the experience created political aftershocks.

A widespread view in Malawi is that crisis was caused by depletion of the strategic reserve, as a result of pressure from the IMF and the World Bank (Chirwa, 2007). The IMF attributes the crisis to 1) the sale of the stock before the 2001 harvest assessments had been completed, 2) the sale of the entire stock rather than reducing it to the recommended level, and 3) the lack of good information on size of the shortfall. They also note that the sale of the stock was not authorized by the government, leading to a corruption investigation (IMF, 2002). Rubey (2003; 2005) notes that even 167 thousand tons would not have filled the maize deficit in early 2002. He points to the policy environment that inhibited private sector response:

Much of the price volatility in late 2001 and early 2002 was due to lack of private sector action in bringing in supplies from outside the country when prices went up. The private sector was unwilling to act because of the uncertainty about government intervention in the market as well as subsidized consumer maize prices that eliminated any profit incentive to import (Rubey, 2003).

ADMARC sold maize imported from South Africa at below-market prices, discouraging any private imports. When traders realized that ADMARC would run out before the harvest, they began to arrange imports, but it was too late to avoid a shortage and severe price spike in early 2002 (Rubey, 2005; Jayne et al, 2005).

5.6 Experience with the 2005-06 food crisis

Malawi experienced another price spike in late 2005 and early 2006. In large part, this was caused by poor rains in the 2004-2005 growing season. In addition, it was expected that the new government would implement an expanded fertilizer subsidy program, so many farmers waited to purchase fertilizer. Private fertilizer dealers were reluctant to import given the expectation of a large subsidy program. The implementation of the subsidy program was delayed by debate with the government and reduced in size due to funding constraints. By the end of October, barely one third of the fertilizer needed for planting was available (FAO-WFP, 2005; Rubey, 2005). This contributed to the 24% decline in the 2005 maize harvest, below an already low 2004 harvest. It is interesting to note that, although the 2005 harvest (1.2 million tons) was much smaller than in 2002 harvest (1.7 million tons), the price spike in early 2006 was much less severe than in early 2002. This suggests that the appropriate policy environment can ameliorate the impact of supply shocks on food prices.

5.7 Experience with the 2007-08 food crisis

The combination of good rains in the 2006-07 agricultural year and the newly expanded fertilizer subsidy program led to a bumper crop in 2007, estimated at 3.4 million tons of maize. The government issued tenders to traders to assemble 450 thousand tons for export to Zimbabwe. By late 2007, the government had exported 283 thousand tons. However, in the process, the price of maize was bid up 65% over the second half of the year, causing the government to suspend the procurement program. In fact, prices in Malawi rose above those in neighboring countries, resulting in an inflow of maize from Mozambique and Tanzania through cross-border trade (Jayne et al, 2008b).

In 2008, the government reported another bumper harvest, with an estimated surplus even larger than in 2007. As ADMARC began its procurement program, it was forced to raise the

buying price numerous times in order to compete with traders. By August, ADMARC and NFRA were only able to purchase 60 thousand tons, and the maize price in Lilongwe had risen to close to US\$ 400 per ton. Reflecting the widespread view that the high prices were the result of hoarding by traders, the government banned private trade in maize in August 2008, effectively restoring the legal monopoly of ADMARC on maize trading. Later, the ban was partly relaxed to allow small-scale trade, provided the price ceiling of 52 MK/kg is respected (Jayne et al., 2008b; FAO, 2009d; ANN, 2008). The ceiling does not seem to be enforced, given that the retail price of maize rose above 70 MK/kg in early 2009.

Jayne et al. (2008b) argue that official crop production estimates for 2007 may be overestimated. They note that high prices, maize imports, and rationing by ADMARC “are difficult to reconcile with the official estimates of a record maize harvest of 3.4 million tons in 2007.”

The 2009 maize harvest was estimated at 3.6 million tons. In response, the government has lifted the ban on private maize exports. In addition, maize prices are declining, so that the 52 MK/kg ceiling is no longer binding, though prices remain above the pre-crisis average (FEWS-NET, 2009).

6 Summary and conclusions

The agricultural economy of Malawi has four characteristics that make managing food prices particularly difficult. First, the diet is heavily dependent on maize, this commodity accounting for over half of the caloric intake. This means that food security is closely tied to the harvest of one crop. Second, Malawi is landlocked, so imports and exports face high costs of transport. This creates a wide band between import and export parity prices within which domestic prices can fluctuate, although cross-border trade with Tanzania and Mozambique lowers the effective import parity price to some degree. Third, the unimodal rainfall pattern means that the seasonal fluctuation in prices is greater than in some other countries in the region such as Kenya and Uganda. And fourth, the high population density, small farms, and low level of income of farmers, even by African standards, mean that many rural households are one bad harvest away from hunger and deprivation. As a result, maize price volatility is higher in Malawi than elsewhere in the region, and the volatility has serious implications for food security.

Studies of market integration in Malawi suggest that 1) market liberalization has improved the degree of integration between major towns in the country, 2) the major towns are integrated with each other with relatively rapid adjustment, suggesting functioning markets, and 3) smaller and more remote town remain disconnected from national markets.

The evolution of food policy in Malawi reveals a somewhat erratic process of market liberalization. ADMARC lost its monopoly over grain trade in 1989 and its role in enforcing a price band in 2000, but the monopoly was temporarily restored in response to the food crisis of 2007-08. Similarly, food price controls were eliminated in the 1980s but reinstated in 2008 (though not fully enforced). Fertilizer policy has also experienced numerous changes and reversals.

The fertilizer subsidy program has been credited with four consecutive bumper harvests in maize (2006-09). Critics point out that it has largely displaced the private distribution network, that the costs may be unsustainable, and that the 2007 harvest was probably

overestimated, but it is popular in the country and is being adopted by a number of other African countries.

On the other hand, the parallel commercial operations of traders and the government have created problems. In 2001, the sale of subsidized maize and the plans for public-sector maize imports inhibited private imports, creating a serious shortage when ADMARC stocked out and government imports were delayed. In 2004, fertilizer imports were stalled by a when government plans to launch the new subsidy program were delayed and scaled back. Experience suggests that private traders can play a useful role in importing maize during shortages, thus putting a ceiling on maize prices, but only if they can be reassured they will not be competing with subsidized government imports. One the main challenges facing policymakers in Malawi is to design a framework for public sector intervention in food markets which is flexible enough to allow it to respond to emergencies, yet limited, transparent, and predictable enough to provide the private sector with a business environment that will favor trade, storage, and marketing investment.

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