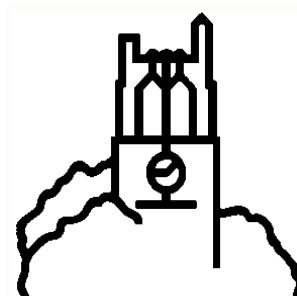


# MSU International Development Working Paper

## **THE 2008/09 FOOD PRICE AND FOOD SECURITY SITUATION IN EASTERN AND SOUTHERN AFRICA: IMPLICATIONS FOR IMMEDIATE AND LONGER RUN RESPONSES**

by

**T.S. Jayne, Antony Chapoto, Isaac Minde, and  
Cynthia Donovan**



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**December 2008**

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## EXECUTIVE SUMMARY

The dramatic rise in world food prices since 2007 has commanded the world's attention. However, in recent months, world food prices have fallen almost as rapidly as they had risen in late 2007 and early 2008, yet as is demonstrated in this report, domestic food price levels in many eastern and southern African markets are not closely tracking world prices. Fertilizer prices remain at unprecedentedly high levels and may have a critical influence on future food production levels in the region. Against this backdrop, there is an urgent need for information about how the current food situation is unfolding in the region, the immediate policy response options, and the longer-term challenges and opportunities.

This study has three objectives: 1) to examine the impact of recent world food price changes on domestic maize and fertilizer prices in the region; 2) to assess possible changes in cropping patterns, national food production, and consumers' access to food in light of these price movements; and 3) to consider the implications for policy and program response by governments, donors, and the private sector.

The report highlights seven main findings:

- 1. While world and South African maize prices have plunged precipitously between August and December 2008, this decline has not been reflected at all in the eastern and southern African markets examined.* In parts of the region, most notably Malawi, maize prices are now substantially higher than the cost of importing maize from South Africa, yet imports are not occurring. While the rise in world food prices had an undeniable impact on maize prices in the region up till mid-2008, the continued rise in food prices in countries such as Malawi and Zambia during the latter half of 2008 are primarily due to local policy-related factors.
- 2. When examined in real local currency units, maize prices in 2008 vary considerably across countries.* In Malawi and Mozambique, maize prices are at or near historic highs in inflation-adjusted terms. In Kenya and Zambia, by contrast, retail maize meal and bread prices in inflation-adjusted terms have declined gradually for the past 15 years, due to reductions in maize marketing and milling costs over time associated with market liberalization. There has been an upturn in real maize prices in Kenya and Zambia from late 2007 to mid 2008, but even during this period real prices were no higher than their mean levels over the past 15 years.
- 3. There is some evidence of a potential food crisis emerging in Zambia and possibly Malawi in early 2009, not because of world food price levels, but because of potential physical shortages, which are likely to send maize prices sharply higher over the coming months.* In both countries, national maize supplies may be depleted before the 2009 harvest and maize imports may be required to avoid rationing of government stocks. Maize retail maize grain prices in both Zambian and southern Malawian markets, as of December 2008, are in the range of US\$500 per ton or higher. Despite the gains in consumer welfare that would result from importing maize at this time, the issuing of licenses for maize importation has only been given in Zambia since December 2008 and has still not occurred in Malawi as of December 2008.
- 4. Opportunities to relieve maize deficits in the region and partially stabilize prices are being hindered by barriers to regional trade.* Regional trade could be playing a larger role in delivering maize supplies to areas of the region where prices have escalated the most. Zambia, Malawi, and Tanzania have all imposed export bans or trade restrictions on maize

over the past 24 months to protect domestic supplies. Another major impediment to private sector maize importation is the threat that government will import and release its stocks at prices below the cost of importation. Because such a move could impose large financial losses on traders, consultation and trust between the public and private sectors is needed to effectively avert the potential for food crises during times of national production shortfalls.

*5. Events in 2007 and 2008 are underscoring the crucial importance of timely crop production and market information systems.* It is becoming increasingly clear that national crop estimates in some countries are unreliable. Price stability in the region requires accurate crop forecasts so that other plans, such as export volumes, quantities to be purchased by the World Food Programme through local and regional purchase operations, and state marketing board purchases and stock releases, can be made without having unexpected effects on prices. A clear example how inaccurate crop production estimates can exacerbate food insecurity is the case of Malawi in 2007/08. On the basis of the Government's forecast of a record maize harvest in 2007 and a projected maize surplus of 1.2 million tons over national consumption requirements, the government contracted with other states in the region to export over 400,000 tons of maize. However, the government was only able to source some 300,000 tons and this sent the price of maize rocketing to levels seen only in the most severe drought years. In hindsight, it is widely believed that the 2007 Malawi harvest was overestimated by at least 25%. If the government had been able to produce a more accurate estimate of crop production, it might not have arranged to export maize, which in turn might have avoided the huge price surge in late 2007/early 2008 which caused great hardship for maize buying households.

*6. There will almost definitely be a major drop in fertilizer use on staple food crops in the region in 2008.* Relatively low maize-fertilizer price ratios in 2008 are likely to produce several unwelcome outcomes: (a) less fertilizer used on maize and other crops in the coming cropping season; (b) lower maize yields and production, other factors constant; (c) continued upward pressure on maize prices, even in countries that so far have not experienced major price increases; and (d) a possible shift in area out of crops that require heavy fertilization for profitability and into crops that are profitable even at low or no fertilizer use (e.g., a partial shift into roots and tubers at the expense of maize in the mixed cassava/maize zones, and a shift out of fertilizer-intensive cash crops such as tobacco and tea). The impact of lower fertilizer use on maize production and marketed supplies will be most discernable in countries that make relatively intensive use of fertilizer such as Kenya and least so in countries where fertilizer use on maize is negligible, such as Mozambique.

*7. High fertilizer prices in 2008 are likely to contribute to high food prices in 2009 in the region, even if world food prices continue to decline.* On the surface, it may be expected that the rapid decline in world food prices since mid-2008 should start to put downward pressure on maize prices in eastern and southern Africa. However, to the extent that very high fertilizer prices cause a major reduction in fertilizer use and maize production in the region, the price surface in many parts of the region may remain at import parity levels throughout much of 2009.

*8. The main implications for governments and donors are that the fundamental priorities that have always been the major drivers of agricultural productivity growth and food security remain front and center today.* While high food prices are in some quarters being perceived as a "crisis", in the long run, higher average food prices may bring major opportunities to attract investment in food production and marketing in the region to expand agricultural growth. However, exploiting these opportunities will require a hospitable and predictable



investment climate, and moving toward this hospitable investment climate will require some governments in the region to adopt more stable, predictable and transparent behavior in food and input markets.

It is encouraging to note that African governments and international organizations have recently concurred about the importance of agriculture as a strategic sector and have pledged to “adopt sound policies for agricultural and rural development, and committed themselves to allocating at least 10% of national budgetary resources for their implementation within five years” according to the 2003 African Union Maputo Declaration. So far, only six countries have reached or surpassed this 10% level. Ensuring renewed commitment to these pledges to agriculture, especially in an environment of higher average food prices over the coming years, remains a strategic priority.

Governments in the more developed countries also have a crucial role to play, first by providing greater support for investments known to have high long-term payoffs for smallholder agriculture; second, by being receptive to changing their own agriculture and trade policies that create an unlevel playing field in world markets; and third, to reassess energy policies that may exacerbate food insecurity in low-income countries.



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## ACRONYMS

|          |  |
|----------|--|
| ADMARC   | Agricultural Development and Marketing Corporation                                   |
| AMIC     | Agricultural Market Information Centre, Ministry of Agriculture and Cooperatives     |
| CPI      | Consumer Price Index   |
| CSO      | Central Statistical Office   |
| DRC      | Democratic Republic of Congo   |
| ERS      | Economic Research Service  |
| FANRPAN  | Food, Agriculture and Natural Resource Policy Analysis Network                       |
| FAO      | Food and Agricultural Organization of the United Nations                             |
| FEWS NET | Famine Early Warning Systems Network   |
| FOB      | Freight on Board   |
| FRA      | Food Reserve Agency  |
| INE      | National Statistics Institute  |
| IPP      | import parity  |
| MACO     | Ministry of Agriculture and Cooperatives, Zambia                                     |
| MOU      | Memorandum of Understanding  |
| MT       | <i>Meticals</i>  |
| MTN      | <i>Meticals da Nova Familia</i>  |
| NCPB     | National Cereals and Produce Board (Kenya)   |
| NFRA     | National Food Reserve Agency   |
| SAGIS    | South Africa Grain Information System  |
| SIMA     | Sistema de Informação de Mercados Agrícolas (Agricultural Market Information System) |
| UN       | United Nations   |
| U.S.     | United States  |
| USDA     | U.S. Department of Agriculture   |
| US\$     | U.S. Dollar  |
| VAT      | Value added tax  |
| WFP      | World Food Programme   |



## 1. INTRODUCTION

The dramatic rise in world food prices since 2007 has commanded the world's attention. Fears of high grain prices and potential shortages have caused at least 30 developing countries around the world to restrict or ban the export of foodstuffs (New York Times 2007). However, in recent months, world food prices have fallen almost as rapidly as they had risen in late 2007 and early 2008, yet as will be demonstrated below, domestic food price levels in many eastern and southern African markets are not closely tracking world prices. Fertilizer prices remain at unprecedentedly high levels and may have a critical influence on future food production levels in the region.

African policy makers are grappling with what these unstable world food prices and high fertilizer prices mean for their countries, how these price movements will affect the food insecurity situation in the coming lean season, how the private sector is likely to respond, and how governments themselves should respond. Likewise, international donors and NGOs are trying to identify how they can help, or at least not respond in ways that make the situation worse. Against this backdrop, there is an urgent need for information about how the current food situation is unfolding in the region, the immediate policy response options, and the longer-term challenges and opportunities.

This study has three objectives: 1) to examine the impact of recent world food price changes on domestic maize and fertilizer prices in the region; 2) to assess possible changes in cropping patterns, national food production, and consumers' access to food in light of these price movements; and 3) to consider the implications for policy and program response by governments, donors, and the private sector. We focus on maize, the primary food crop in the region, and fertilizer, in Kenya, Malawi, Mozambique, Zambia, and South Africa. Zambia and especially South Africa are the largest maize exporters in the region, while Kenya and Malawi are typically importing countries. Mozambique typically simultaneously exports and imports maize, exporting from its northern production areas while its southern deficit areas import from South Africa and the world market.

The report highlights eight main findings:

1. While world and South African maize prices have plunged precipitously between August and December 2008, this decline has not been reflected at all in the eastern and southern African markets examined. In parts of the region, most notably Malawi, maize prices have continued to rise throughout 2008 and are now substantially higher than the cost of importing maize from South Africa. Despite the gains in consumer welfare that would result from importing maize at this time, imports are not being arranged.
2. When examined in real local currency units, maize prices in 2008 vary considerably across countries. In Malawi and Mozambique, maize prices are at or near historic highs in inflation-adjusted terms. In Kenya and Zambia, by contrast, retail maize meal and bread prices in inflation-adjusted terms have declined gradually for the past 15 years, due to reductions in maize marketing and milling costs over time associated with market liberalization. However, tracking food prices in inflation-adjusted terms is likely to underestimate the degree of vulnerability faced by low-income consumers in recent months. Price inflation during the first half of 2008 has been high, meaning that the price of fuel and other consumer goods are rising relatively quickly and eroding purchasing power. In an inflationary environment, the fact that food prices may be rising less rapidly



than most other goods in the CPI does not necessarily mean that food is become relative cheap for consumers.

3. At least in Zambia, wage rates have increased faster than food prices over the past decade, although some ground has been lost in 2008. Trends in food prices compared to wage rates could be examined in only one country, Zambia, due to unavailability of wage rate information in the other countries. For Zambian civil service employees and the average of all wage earners, the ratio of wages to maize prices has risen appreciably over the past decade, making food relatively more affordable to workers. Some ground has been lost since the end of 2007, but the decade-long decline in staple food prices relative to wages has made the current price surge more tolerable to most urban consumers in Zambia. Government wage/maize price ratios in 2008 remain considerably higher than over most of the 1990s and early 2000s. Still, there is likely to be great hardship for the rural household running out of maize before the 2009 harvest (typically 30-50% of the rural population).

4. There is some evidence of a potential food crisis emerging in Zambia and possibly Malawi in early 2009, not because of world food price levels, but because of potential physical shortages, which are likely to send maize prices sharply higher over the coming months. Maize retail maize grain prices in both Zambian and southern Malawian markets, as of December 2008, are in the range of US\$500 per ton or higher. The Zambian government has now arranged for maize imports as of December 2008. By contrast, Kenya and Mozambique have imported maize in 2008 relatively smoothly. Mozambique in particular has pursued a stable trade policy environment which relies almost completely on the private sector to stabilize prices through imports and exports.

5. Opportunities to relieve maize deficits in the region and partially stabilize prices are being hindered by barriers to regional trade.

6. Events in 2007 and 2008 are underscoring the crucial importance of timely crop production and market information systems.

7. There will almost definitely be a major drop in fertilizer use on staple food crops in the region in 2008.

8. High fertilizer prices in 2008 are likely to contribute to high food prices in 2009 in the region, even if world food prices continue to decline.

The main implications for governments and donors are that the fundamental priorities that have always been the major determinants of smallholder livelihoods and incomes remain front and center today. While rising food prices are currently being perceived as a *crisis*, in the long run higher average food prices may bring major opportunities to attract investment in food production and marketing in the region to expand agricultural growth. However, exploiting these opportunities will require a hospitable and predictable investment climate, and moving toward this hospitable investment climate will require some governments in the region to adopt more stable, predictable and transparent behavior in food and input markets. A hospitable climate for domestic and international investment in food production and marketing will also require greater public investment in areas that reduce marketing and production costs: physical infrastructure investments to lower marketing and service delivery costs, crop science research to improve productivity and lower production risks, effective technology transfer programs to ensure the delivery of improved crop husbandry knowledge

to farmers, and effective organization of small-scale farmers into groups to reduce the costs of technology transfer, delivery of credit and other inputs, and marketing of surplus production.

It is encouraging to note that African governments and international organizations have recently concurred about the importance of agriculture as a strategic sector and have pledged to “adopt sound policies for agricultural and rural development, and committed themselves to allocating at least 10% of national budgetary resources for their implementation within five years” according to the 2003 African Union Maputo Declaration (FAO 2004). So far, only six countries have reached or surpassed this 10% level. Ensuring renewed commitment to these pledges to agriculture, especially in an environment of higher average food prices over the coming years, remains a strategic priority.

Governments in the more developed countries also have a crucial role to play, first by providing greater support for investments known to have high long-term payoffs for smallholder agriculture; second, by being receptive to changing their own agriculture and trade policies that create an unlevel playing field in world markets; and third, to reassess energy policies that may exacerbate food insecurity in low-income countries. Flexibility and compromise in developed country agricultural and energy policies will need to be shown in an increasingly interdependent world to create the political space within African policy processes for sustained long-term investments in smallholder agriculture.

## 2. DATA

The conclusions in this report are derived from four data sources: market price data collected by the national market information systems in the various countries, food balance sheets and official national production estimates, nationwide surveys of rural households, and interviews of traders, millers, government officials, and other agricultural sector stakeholders carried out throughout the first nine months of 2008.

Maize market price trends are reported in several ways: (i) nominal U.S. Dollar (US\$) per metric ton; (ii) nominal local currency units; (iii) inflation-adjusted local currency units; and, where feasible, (iv) nominal local currency maize prices relative to wage rates. We use the general consumer price as the deflator in (iii) as it representative of trends in food prices relative to trends in the prices of a broad range of goods and services in the overall economy.

Staple food prices are contained in the CPI, with weights representing the share of staple foods in urban household expenditures. In most countries, this is about 20 to 25% of the CPI. This means that in countries where food prices are rising faster than the remaining basket of goods and services in the CPI, deflating prices will underestimate the extent of the real food price increases. In countries where food prices are rising less rapidly than the remaining basket of goods and services, the use of the CPI will overestimate the extent of the any food price increases relative to changes in general prices.<sup>1</sup>

The monthly maize price information and CPI information were acquired from the national statistical agencies in charge of collecting food price data. In Zambia, Mozambique, and Malawi, the maize prices are specified as retail market prices, while in Kenya and South Africa, maize prices are considered to be wholesale prices. The specific sources are as follows:

- Zambia: the Agricultural Market Information Centre (AMIC), Ministry of Agriculture and Cooperatives (MAACO); and the Central Statistical Office (CSO), Republic of Zambia.
- Mozambique: Ministry of Agriculture Agricultural Market Information Center (SIMA), and the National Statistics Institute (INE) of Mozambique.
- Kenya: Market Information Bureau, Ministry of Agriculture and Livestock, Government of Kenya; Central Bureau of Statistics.
- Malawi: Famine Early Warning Systems Network (FEWS Net), from the Ministry of Agriculture price monitoring system; National Statistical Office.
- South Africa: South Africa Grain Information System (SAGIS); Statistical Agency of South Africa.

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<sup>1</sup> In Mozambique, where data was available to construct both an urban CPI and a non-food CPI, these two series were strongly correlated, indicating that food and non-food prices moved together fairly closely.

### 3. REASONS FOR THE RISE IN WORLD FOOD PRICES

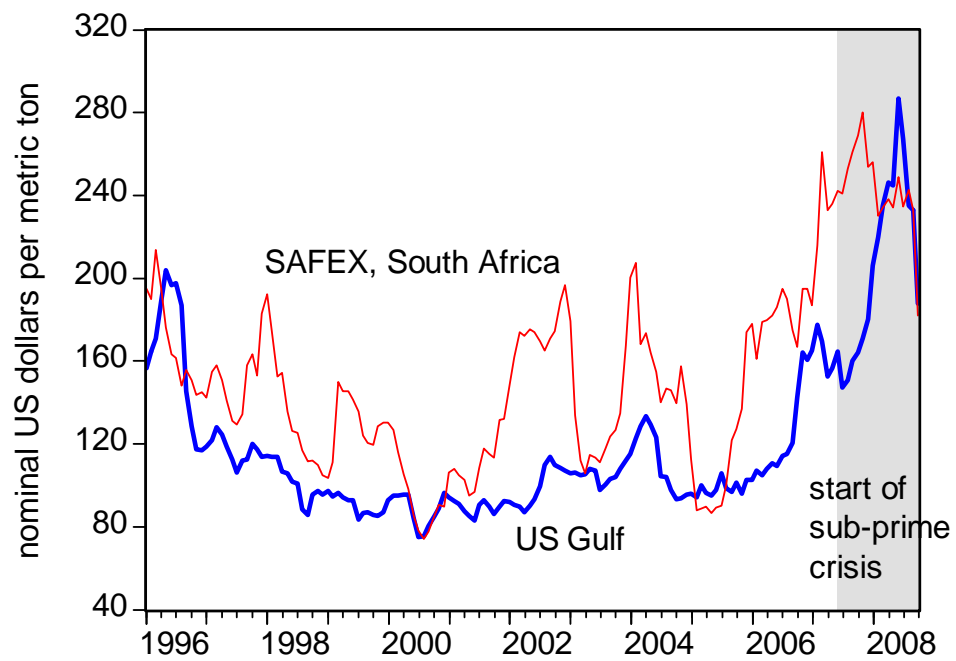
When escalating world food prices initially captured the world's attention in 2007, explanations centered on (a) a shift in land use from food crops to biofuels; (b) rising incomes in middle-income countries such as Brazil, China and India and an associated increase in demand for animal products and grain for feed; (c) declining world food stocks; and (d) droughts and floods associated with climate change in general, and recurrent drought in major food exporting countries such as Australia (von Braun 2008; Polaski 2008; World Bank 2008).

More recent explanations have emphasized the role of the housing market crisis in the United States starting in mid-2007 and the subsequent expansionary monetary policy by the U.S. Federal Reserve Bank (Calvo 2008; Rojas-Suarez 2008). Indeed, food prices from 2000 to the end of 2006 had increased only gradually (Figure 1). The dramatic surge in world food prices since late 2007 suggests additional factors beyond the mostly long-term structural changes in world grain markets as identified earlier. These more recent analyses do not discount the role of biofuels, longstanding energy policies, and rising incomes in middle-income countries in raising long-term world food prices, but they contend that the acute acceleration in virtually all commodity prices since late 2007, including food prices, is mostly a monetary phenomenon starting with the U.S. sub-prime crisis in mid-2007. The Federal Reserve cutting of U.S. interest rates led to capital flight out of U.S. Treasury instruments starting in mid-2007 in search of higher returns in equity and commodity markets. Capital flight out of the U.S. also contributed to depreciation of the U.S. dollar. Both dollar depreciation and increased speculative investment in major commodities denominated in U.S. dollars caused commodity prices to rise sharply in early 2008. However, the depreciation of the U.S. dollar relative to most other major currencies in 2007 and early 2008 caused the food price rise to appear more spectacular when viewed in dollars compared to most other currencies. For example, while freight on board (f.o.b.) U.S. Gulf maize prices between 2006 mean levels and August 2008 have risen by 88% when denominated in US\$, this increase has been only 46% when denominated in Euros.

It is also necessary to keep in mind that part of the maize price rise in 2006 and early 2007 was due to transitory phenomenon – two successive sub-normal harvests in South Africa in 2006 and 2007; extreme drought and crop failure in Australia, and a low 2006 maize harvest in Argentina – all major grain exporters. The implication of this perspective is that 2008 food price levels will not be sustained, especially when U.S. financial markets are stabilized, although long-term grain price levels are indeed likely to remain higher than over the past decade due to the various structural factors stressed earlier.

In fact, some downward pressure on world prices is already occurring (Figure 1). U.S. Gulf prices have declined from US\$287 to US\$229 per ton between June and September 2008 and now stand at US\$152 as of December. Argentine f.o.b. maize prices have likewise declined by 16% between July and September 2008. The December 2008 SAFEX futures price has declined from 2,304 rand/ton (US\$294) on July 1 to 1,662 rand/ton (US\$166) on December 1, a 28% decline in rand terms and a 44% decline in dollar terms. The August 2008 USDA Feed Outlook estimates that the 2008 U.S. corn crop will be the second highest on record and that 2008/09 world coarse grain supplies will also rise dramatically (Baker, Allen, and Lutman 2008). However, for the foreseeable future, world maize and food prices in general are estimated to remain at significantly higher levels than their averages over the past two decades.

**Figure 1. U.S. Gulf and SAFEX/Randfontaine Maize Prices, January 1996 - November 2008**



Sources: USDA for f.o.b. U.S. Gulf yellow maize #2; SAFEX for spot white maize Randfontaine

#### 4. PRICE TRENDS IN EASTERN AND SOUTHERN AFRICAN MARKETS

Table 1 reports price levels for various capital city markets in eastern and southern Africa compared to two important reference prices, maize #2 f.o.b. U.S. Gulf and SAFEX South Africa. Mean prices from over the 2000-2005 period are reported in the first column. Mean prices in the last three crop seasons, 2006/07, 2007/08, and the partially completed 2008/09 season, are reported in the middle columns. The period May to April is used as this conforms to the main season harvest in most of the countries examined. The last column shows the price difference between the various capital city prices and the SAFEX price at the latest available month, September, 2008. This price difference is an indicator of how close the market is to import parity. Transfer costs from Johannesburg to Lusaka and Lilongwe are currently in the area of US\$180-200 per ton, while transfer costs from Johannesburg to Maputo are roughly US\$70 after including the import tariff rate. Transfer costs from Durbin to Nairobi are close to US\$150 per ton.

Maize prices in eastern and southern region in nominal US\$ terms have indeed risen since 2006 but in a dramatic sense only since mid-2007. Rising dollar-denominated maize prices in the region have coincided with – and in some cases preceded – the major rise in world food prices. The upward price movements in South Africa actually preceded the rise in world maize prices due to relatively poor maize harvests in South Africa in both 2006 and 2007. Current 2008 nominal US\$ maize prices in Lusaka, Maputo, and Lilongwe, while high, are not very different from levels prevailing in the 2005/06 drought season. In Kenya and most of east Africa, maize prices were within their usual range for most of 2007, but started to surge in late 2007 and 2008.

**Table 1. Historical Mean Maize Prices, Various International and Regional Markets**

|                     | Historical mean price, 2000-2005 (US\$/metric tons) | May 2006 to April 2007  | May 2007 to April 2008 | May 2008 to October 2008 | Price difference (US\$/mt) between location and SAFEX as of 9/2008 |
|---------------------|---|---|------------------------|--------------------------|--|
|                     |   | Mean US\$/ton (difference from historical mean, US\$ per ton) |                        |                          |  |
| f.o.b. U.S. Gulf    | 99  | 142 (+43)   | 183 (+84)              | 242 (+143)               |  |
| SAFEX, South Africa | 133   | 199 (+66)   | 250 (+117)             | 229 (+96)                |  |
| Nairobi, Kenya      | 192   | 217 (+25)   | 213 (+21)              | 351 (+159)               | US\$123  |
| Lusaka, Zambia      | 184   | 215 (+31)   | 232 (+48)              | 286 (+102)               | US\$98   |
| Lilongwe, Malawi    | 173   | 157 (-16)   | 209 (+36)              | 348 (+175)               | US\$154  |
| Maputo, Mozambique  | 225   | 247 (+22)   | 305 (+80)              | 403 (+178)               | US\$171  |

Sources: National Market Price Information Systems

## 4.1. Kenya

The staple food harvests in 2008 have been variable, with mixed implications for the need for food imports from world markets. In Kenya, the main season harvest in late 2008 is expected to be adversely affected by high fertilizer and fuel prices as well as post-election violence in early 2008. This is likely to translate into tight market conditions by early to mid 2009 and move the country into an import situation. Moreover, high prices of relatively expensive wheat and rice appear to have significantly depressed consumption of these commodities,<sup>2</sup> and it is likely that this has put additional demand pressure on relatively lower-priced maize meal. Imports from Tanzania and Uganda could satisfy much of Kenya's residual maize import requirements, but Tanzania has an export ban in place. Kenya, on the other hand has a 50% import duty on maize, but the government marketing board, the National Cereals and Produce Board (NCPB), can import without duty. These circumstances lead to a situation in which the Kenyan government must arrange to import maize from the world market, which is likely to cause the maize price surface to rise unnecessarily from current levels of US\$300 to US\$330 in central and western Kenya as of September 2008 to world market import parity levels of roughly US\$400-US\$430 by early/mid 2009. If regional trade policy were able to facilitate cheaper maize imports from Tanzania, the price rises to be experienced by Kenya in early 2009 would likely be less.

Meanwhile, the relatively good harvest in Tanzania has kept prices relatively low; Dar es Salaam maize prices have been declining from March to August 2008 and are currently at US\$240/ton (RATIN September 2008). This is much lower than the prices in most other markets of the region in 2008/09 as shown in Table 1. The Tanzanian export ban, to the extent that it is raising the costs of trade rather than stopping it, is adversely affecting surplus maize producers in much of Tanzania as well as consumers in Kenya.

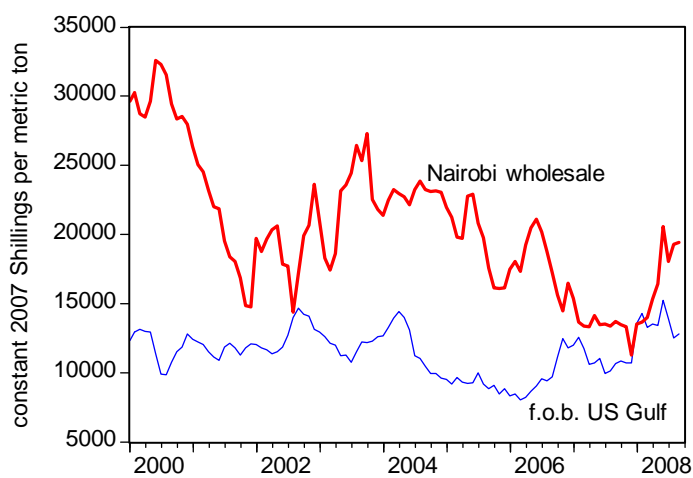
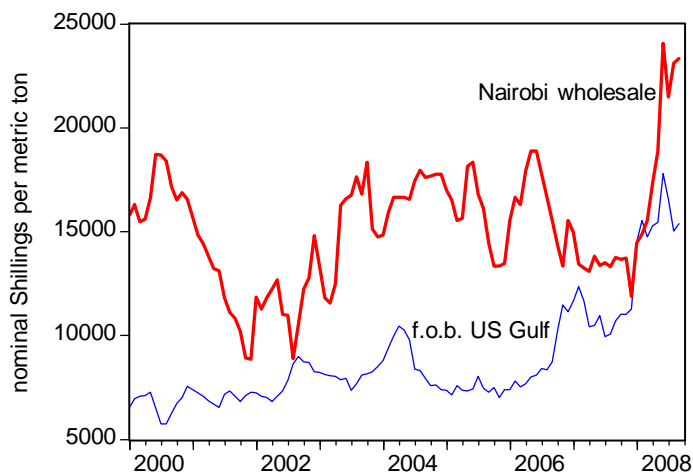
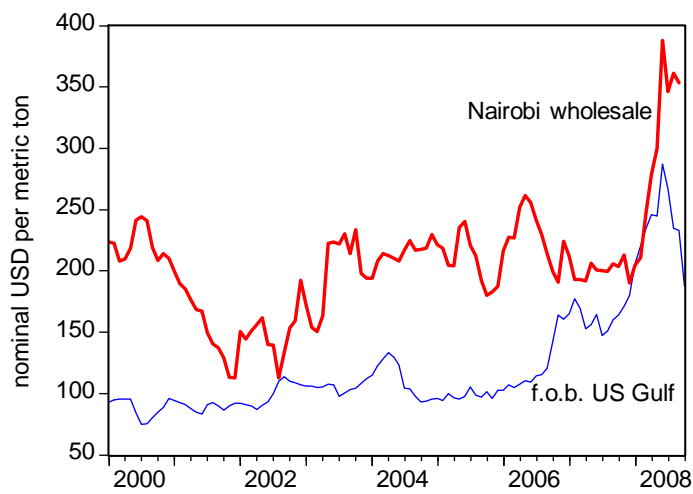
Figures 2a, 2b, and 2c present Nairobi wholesale maize price trends denominated in U.S. dollars, nominal shillings, and constant 2007 shillings per ton. The first two figures in nominal terms are consistent with the widespread perceptions of a food crisis in 2008, with 2008 prices at unprecedented levels. Note that 2007 prices were relatively average despite the rise in world food prices that had already begun.

After deflating by the CPI as in the Figure 2c, the picture changes substantially. Because of a long-term secular decline in maize prices (and maize meal prices) starting in the mid-1990s, the real price of staple food has declined in Kenya. There has been a sharp upturn in real maize prices since early 2008, but they are still lower than the historical average over the 2000-2008 period. However, we stress that tracking food prices in inflation-adjusted terms may underestimate the degree of vulnerability faced by low-income consumers during episodes with general price inflation is high. A low *real* maize price, defined as the nominal maize price divided by a general consumer price index, simply means that maize prices have risen no faster than fuel and other prices in the economy, some of which have risen very rapidly indeed. Our ability to track maize prices relative to wages is confined to Zambia to which we now turn.

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<sup>2</sup> Based on interviews of representatives of selected wheat and rice milling companies in September 2008.

**Figures 2a, 2b, and 2c. Nairobi Wholesale Maize Prices vs. F.O.B. U.S. Gulf Prices, 2000-2008, Nominal U.S. Dollars, Nominal Shillings, and Constant 2007 Shillings Per Ton**





## 4.2. Zambia

The 2008 maize harvest in Zambia was estimated to be slightly below that of recent years. The marketing board, the Food Reserve Agency (FRA), announced a buying price of 45,000 kwacha/ton (roughly US\$ 260/ton) and has banned private exports. Because of nervousness in the markets, private millers and traders started the 2008 season by aggressively buying maize at prices higher than the FRA floor price. The FRA countered by raising its buying price to 55,000 kwacha (US\$304) per ton in an attempt to procure its target supplies. Aggressive attempts by both private traders and the government pushed prices up quickly after the 2008 harvest. Upward pressure on market prices has been compounded by perceptions that food balance sheet estimates are likely to have underestimated the demand for maize. Several key informants interviewed in September 2008 indicate that official food balance sheets underestimated the demand for maize from the animal feed industry, the likely substitution in consumption from wheat to maize, and the higher than normal demand for maize through informal marketing channels for export to the Democratic Republic of Congo (DRC) and Malawi, despite the official ban on private export.

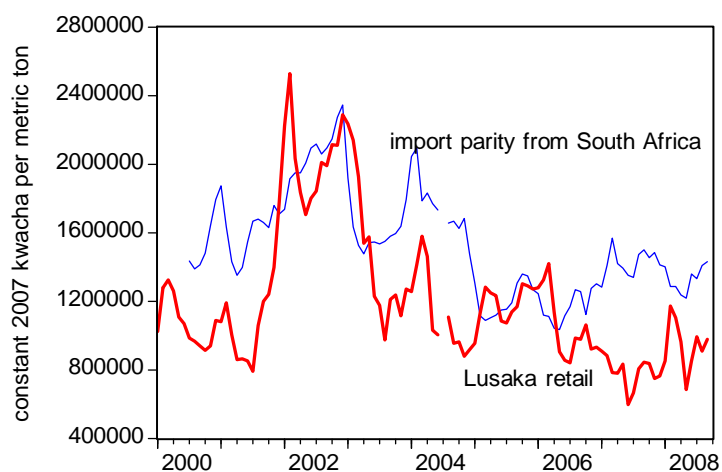
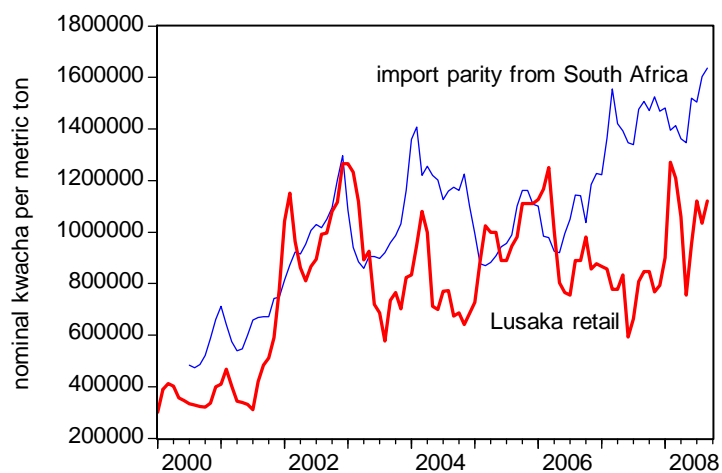
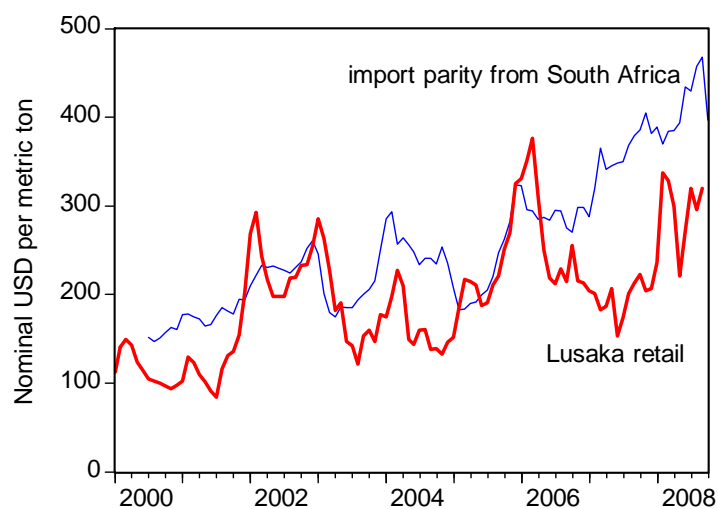
In June of 2008, the Grain Traders Association of Zambia informed the Ministry of Agriculture that roughly 200,000 tons of maize would be required to fill residual consumption requirements in early 2009. Private traders are free to import on their own volition, but they fear that the Government may import as well and then subsidize the sale price to millers, effectively undermining the market for their own imported grain. To resolve this contingency, the Grain Traders Association of Zambia has sought to sign a Memorandum of Understanding (MOU) with Government to allow them to import agreed upon quantities without threat of simultaneous government importation. The Government has refused such an agreement on the grounds that even if the private sector imports sufficient quantities to meet domestic demand, the price levels obtained may be intolerably high and therefore it retains the right to influence maize prices in the country.

As of November 2008, neither the government nor the private sector has arranged to import maize. For these reasons, the price surface in Zambia has been rising toward import parity from South Africa. As of October, retail maize prices were in the range of US\$340 per ton compared to US\$232 per ton on the SAFEX exchange.

If imports are not mobilized soon, it is highly likely that shortages may surface and send prices shooting over import parity. It generally takes 2-3 months at a minimum for imports to arrive in country from South Africa once the transaction has been made. Coordination between the public and private sector over the quantities of maize to be imported and the price at which imported maize will be sold is urgently needed to avert a potential catastrophe. Note, however, that the problem is not the high price of maize in international markets; it is due to difficulties between the public and private sector in agreeing on the modalities for importation.

Examination of 2008 price levels in Zambia indicates that while they are indeed relatively high in nominal US\$ and kwacha terms (Figure 3a and 3b), they are within the range of prices observed during several periods 2000. Note that the extent of the 2008 price rises in nominal kwacha appear less severe than when examined in nominal U.S. dollars, which is due to a 20% appreciation of the kwacha relative to the dollar between 2005 and 2007.

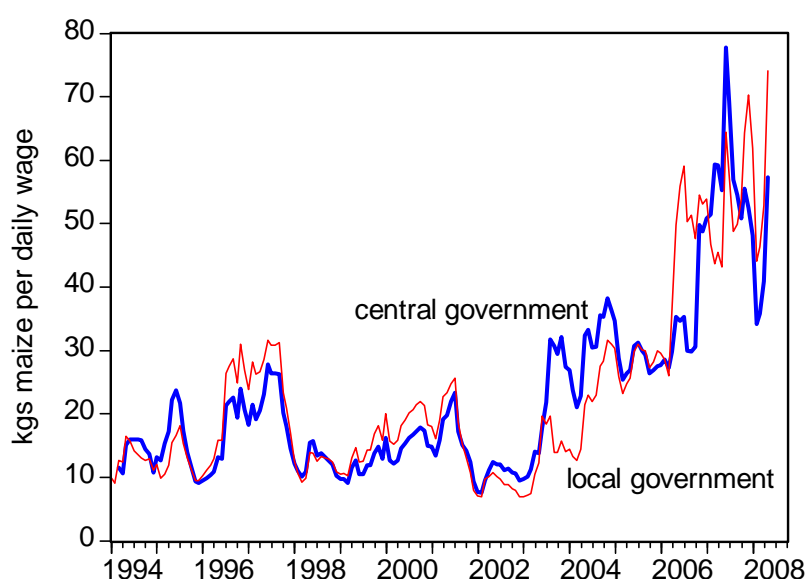
**Figures 3a, 3b, and 3c. Lusaka Retail Maize Prices vs. Import Parity from South Africa, 2000-2008, Nominal U.S. Dollars, Nominal Kwacha, and Real Kwacha Per Ton**



When examining maize prices in inflation-adjusted kwacha terms (Figure 3c), the situation appears very different, as in Kenya. Inflation-adjusted maize prices in 2008 are actually lower than mean levels over the 2000-2006 period. The downward trend in real maize meal prices is even more pronounced than for maize grain prices, reflecting increased competition in maize processing since the late 1990s. As indicated earlier, this does not necessarily mean that low-income consumers are not facing difficulties. To assess changes in maize prices relative to wage rates, we obtained wage rate information from the CSO, which tracks central government and local government wage rates on a quarterly basis. After interpolating quarterly to monthly data and interpolating for missing quarters, we computed the kilograms of maize capable of being purchase per daily wage. While data ends in the last quarter of 2007, we set wages for the first half of 2008 equal to nominal wages in the last quarter of 2007, which assumes no wage adjustments from late 2007 levels. An increase in this ratio would indicate that government wage earners can buy more maize with their earnings (i.e., wage rates relative to maize prices are rising). A decline in this ratio indicates that maize is becoming more expensive relative to wage rates). Findings are presented in Figure 3d.

Between 1994 and 2002, the kilograms of maize capable of being purchased with the average government wage rate fluctuated between 10-20 kgs per day. However, since 2002 and up to mid-2007, both central and local government wages have increased considerably more rapidly than maize prices. By early 2007 for example, both local and central government wage earners could purchase, on average, roughly 50kgs of maize per day, at retail levels in Lusaka. Since early 2007, some ground has been lost especially for central government employees as this ratio has declined to 35 kgs of maize per day in early 2008. Wage rates for local government employees increased in 2007, largely offsetting the rise in maize prices in 2007 and early 2008.

**Figure 3d. Kilograms of Maize Capable of being Purchased Per Daily Wage Rate for Government Employees, 1994-2008**



Note: computed as daily government wage rates divided by the Lusaka retail maize price per kg.

Overall, Figure 3d presents a cautiously optimistic picture indicating that government wage earners have not been severely affected by the increase in maize prices, at least so far. The CSO's average wage rate index, which averages together the rates for central government, local government, private sector, and parastatal wages, provides much the same picture as represented in Figure 3d.

However, there are several caveats to stress. First, roughly 40% of rural households in Zambia are net buyers of maize. As they run out of maize, the relatively high price of maize is likely to pose major threats to food security. Secondly, a significant portion of the Zambian population remains unemployed or underemployed. Tracking trends in wage rates relative to maize prices would not provide a meaningful indicator of maize affordability for these strata of the population. Third, and as mentioned earlier, the major factor that will affect food security and hunger in Zambia is whether the country can survive on the supply of domestically produced maize. As of November 1, 2008, no arrangements have been made to import maize, either by government or the private sector, despite the private sector having written to the Ministry of Agriculture in June 2008 stressing the need for importation. Therefore, if a food crisis emerges in Zambia in early 2009 it will not be because of high price of maize in international markets but rather due to difficulties between the public and private sector in agreeing on the modalities for importation.

### **4.3. Malawi**

Malawi has recently received critical acclaim for its success in turning the country into a food surplus maize exporter (New York Times 2007).<sup>3</sup> In 2005/06, the government re-introduced a large-scale fertilizer subsidy program (see Dorward et al. 2008 for a detailed assessment). Erratic rainfall in 2005/06 impeded the impact of this program in 2006. In the 2006/07 crop year, the combination of favorable weather and the distribution of improved maize seed and fertilizer through the subsidy program produced what was considered to be a record maize harvest in 2007. The government issued an official maize production estimate of 3.4 million tons. Domestic consumption requirements were believed to be in the range of 2.0 million tons, indicating a surplus of well over a million tons.

In response to the reported surplus, the government issued tenders to private traders to supply 450,000 tons for export to other countries in the region. However, the private sector reported difficulties in sourcing this quantity of maize, and by late 2007 Malawi had only exported 283,000 tons. The government then suspended further exports due to a rapid escalation in domestic market prices. Within several months after the harvest, maize prices reached near record highs, exceeded only in the major crisis year of 2001/2 and the drought year of 2005/06 (Figure 4a, 4b, and 4c). By late 2007/early 2008, maize prices in Malawian markets were US\$100 to US\$150 per ton higher than in other regional markets. The 2007/08 season was also characterized by reports of localized maize shortages, rationing of maize by the marketing board ADMARC, and net maize imports of over 50,000 tons from neighboring countries, primarily Mozambique and Tanzania (Reuters 2008; FEWS Net 2008a). These outcomes are difficult to reconcile with the official estimates of a record maize harvest of 3.4 million tons in 2007.

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<sup>3</sup> President Bingu Wa Mutharika was recently awarded a United Nations (UN) Global Creative Leadership Award and also received the first Food, Agriculture and Natural Resources Policy Network (FANRPAN) food security policy leadership award for reviving the country's fertilizer subsidy programme. He also was honored at the 2008 African Green Revolution Conference in August 2008 for the country's success in promoting food security.

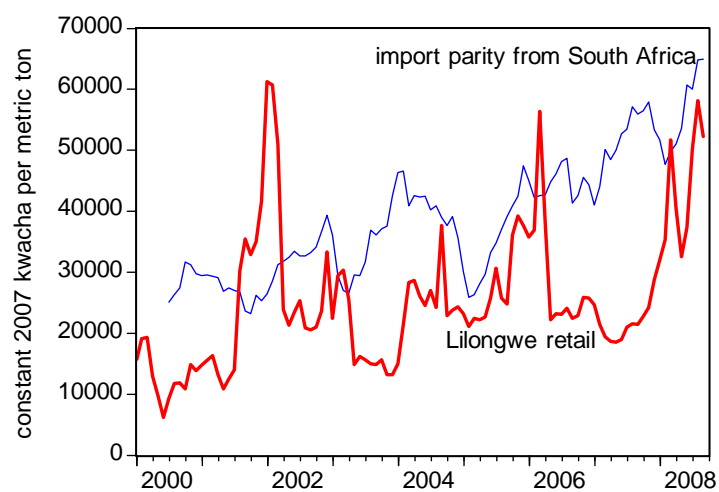
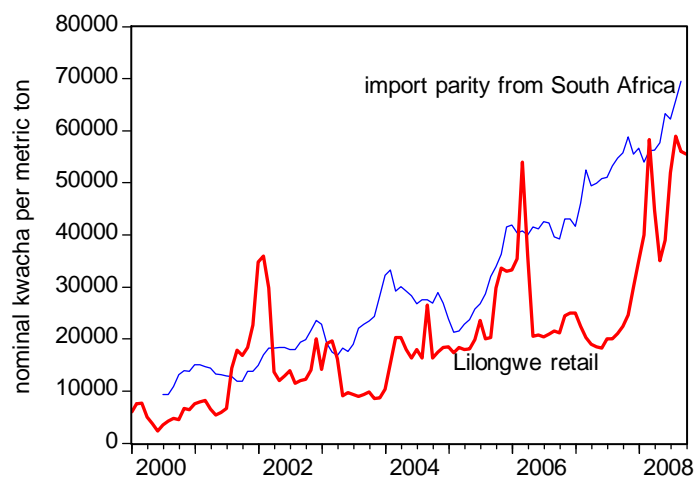
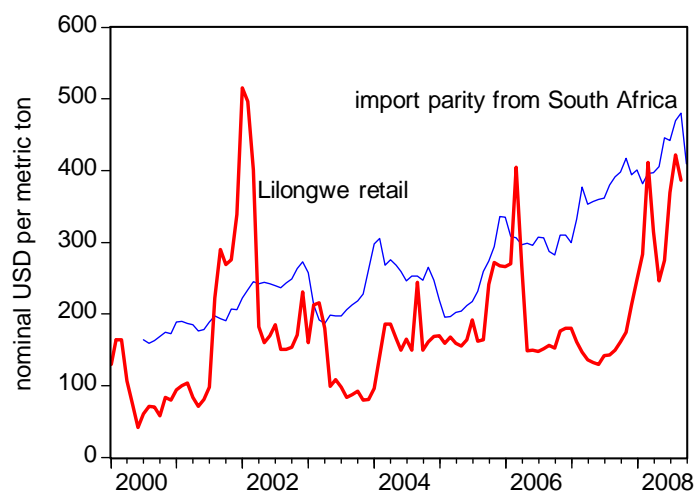
In May 2008 the Government of Malawi reported that the country had produced another major maize surplus, estimated at 500,000 tons. In an effort to provide a floor price for this surplus and to accumulate food security stocks, the government instructed ADMARC to purchase more maize this year than in previous years. To achieve this, ADMARC announced commodity buying prices early in the season and also started buying earlier than usual. ADMARC also opened more seasonal markets and temporary buying points.

ADMARC began procuring maize at 20,000 kwacha (US\$140) per ton at the start of the 2008 harvest, but quickly raised its price to 25,000, then 30,000, and then 40,000 (US\$280) per ton to outbid private traders. However, market prices rose dramatically in response to ADMARC's actions (Figures 4a, 4b, and 4c). By early August, ADMARC and the National Food Security Reserve Agency (NFRA) had procured only 60,000 tons combined, which by most accounts would be far too little to meet the demand for grain at ADMARC depots through the upcoming lean season before the 2009 harvest in May. By early August, only 2-3 months after the reportedly good harvest, maize prices had reached historic highs in nominal terms (Figures 4a and 4b). Many in Malawi felt that these price rises were orchestrated by private traders. On August 19, the Government of Malawi announced that private maize trade was banned and that ADMARC was the sole legal buyer and seller of maize in the country, buying at 45,000 kwacha (US\$316 per ton) and selling at 52,000 (US\$366) per ton. The Government then developed a contract with one large trader to supply maize to ADMARC.

There is increasing speculation that the official government maize production forecasts may have been overestimated. Reduced confidence in official crop forecasts creates difficulties in determining whether formal imports are required. Evidence of overestimated official crop estimates is that while national maize production estimates for the 2007 and 2008 harvests were both far above national consumption requirements, imports from Mozambique and Tanzania have been streaming into the country almost continuously since mid 2007. According to FEWS Net, Malawi imported 59,000 tons of maize in the 2007/08 season through informal cross-border trade flows. In the first 3 months of the 2008/09 season alone, Malawi has imported over 40,000 tons of maize (FEWS Net 2008a).

Uncertainty about the overall market situation and the need for imports has been compounded by the Malawi government's banning of private maize trade in August and the subsequent clarification that small-scale trade is still legal subject to a maximum selling price of 52 kwacha per kg (roughly US\$360 per ton at September exchange rates). Because this selling price is below prevailing prices in most parts of the country, traders holding stocks appear to be either still holding it, processing it into maize meal or animal feed, or exporting it informally. NGOs and World Food Programme (WFP) have indicated that they are unable to source maize in Malawi for school feeding and relief operations because they are forced to tender at prices below 52 kwacha per kg, a level at which both large traders and ADMARC are refusing to sell. Relief organizations cannot request financial support for relief food purchases without a formal recognition of a food problem, which is politically difficult given that the President of Malawi has received international acclaim for his success in turning Malawi into a surplus food producer. Consequently, social entitlement programs may be undermined by the continued price regulations, while relief food operations are at least temporarily impeded. In early October, 2008, the Malawi Vulnerability Assessment Committee released a report estimating that 1.5 million people are vulnerable to food insecurity, as many rural households run out of maize and must purchase their residual food requirements at prices that are already extremely high. Speculation that the country may not have adequate supplies to last till the 2009 harvest may push prices much higher.

**Figures 4a, 4b, and 4c. Lilongwe Retail Maize Prices vs. Import Parity from South Africa, 2000-2008, Nominal U.S. Dollars, Nominal Kwacha, and Real Kwacha Per Ton**



So far the government's position is that there are adequate supplies in the country and that imports are not needed. Although maize continues to be imported informally from Mozambique and Zambia, the government has so far not issued any import licenses to private traders to import from South Africa. Interviews with maize trading and processing firms in October 2008 indicate divided opinion. Many are of the view that supplies are indeed sufficient to last till the 2009 harvest. Others indicate that NFRA and ADMARC stocks are insufficient to satisfy rising demand into the lean season. If the latter scenario arises, the consequences are likely to be rationing of maize,<sup>4</sup> an inability of the government to defend its ceiling price, major increases in food prices, and major hardship for low-income rural and urban households. To avoid this potential scenario, the government may want to consider arranging imports quickly or issuing import permits to add to its strategic stock to avoid a potential food crisis.

#### **4.4. Mozambique**

The quantity of maize produced in Mozambique in 2008 remains in doubt. The official crop forecast estimate released in August 2008 indicates a good crop year with 1.7 million metric tons, 7% higher than the previous year, yet market research suggests that the crop production for 2008 is unlikely to be that high (SIMA Team 2008). Both market research and price analysis show similarities between the current year and the 2005 crop year, in which a record harvest was estimated by the crop forecasting unit (1.7 million metric tons), and yet later household survey results indicated was about 1.14 million metric tons (Kiregyera et al. 2008). Both market research and price analysis support the lower production figure for 2005. According to the Mozambican Ministry of Agriculture's Agricultural Market Information System, the 2008 crop production year faced difficulties due to an abrupt cessation of rains in February in major production zones which negatively affected yields in maize and beans, and affected the cassava planting period (SIMA Team 2008). The problems with crop forecasting are not unique to Mozambique, for Malawi and Zambia have faced similar problems. In Mozambique's case, analysis of household survey data estimates of maize production compared to crop forecasting estimates suggest that the differences between the two sources of production numbers have been growing since 2000 (Kiregyera et al. 2007).

While there is doubt about the total production of maize, agents all agree that there is higher demand on the quantities available in 2008. The SIMA team found the following in a market appraisal in June 2008: "1) an early start to the marketing season; 2) very high prices at the beginning and increases during the period when prices usually decline; 3) strong competition between the formal and informal private sector agents particularly in areas with cell phone coverage; 4) active markets along the routes with best access and with good communication and transport networks; and 5) new or expanded economic agents (animal ration industry growing; new maize mills, new export alternatives, local purchase for food aid)" (SIMA Team 2008, page 1).

New domestic processors are buying and existing buyers are expanding their purchases. Exports to Malawi were high early in the season as well, in spite of the three week Malawian ban in May/June on official maize trading, and current Malawian policies to limit maize trading. Even when there are trade restrictions, substantial maize may flow into Malawi from Mozambique using shortcuts and bicycles, if the prices make the trade profitable (FEWS Net 2008b). One agent affected by the uncertainty in production numbers and the high competition for supplies is the World Food Programme, which is moving cautiously with

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<sup>4</sup> As of October, ADMARC has limited its maximum maize sales volume to 25kg per customer.

local food purchases, completing purchases of 25,000 metric tons by mid-September, at prices ranging from US\$284 early in the season to over US\$400 more recently.

When combined with limited agricultural production, both marketing agents in the field and the SIMA team expect prices to remain high for maize and other food commodities in Mozambique in 2008 into 2009. Figures 5 a, b, and c demonstrate the high prices which have continued into late 2008. Since the value of the metical has remained fairly stable against the dollar, the three graphs demonstrate similar trends. Fuel prices also rose rapidly in late 2007 and early 2008, such that urban transport companies tried to raise their fares. There were one-day riots in Maputo and several other urban areas in the south to protest rises in fares and food prices.

Government officials knew that they needed to respond, so they developed a strategy that involves policy shifts to focus on raising food production, with some attention to improve production and marketing incentives, mostly through the private sector (GOM 2008). Mozambique's food policy environment differs from its neighbors in several fundamental respects, and for this reason, its response to the 2008 food crisis is also different. First, Mozambique has not had a strong public sector presence in food staple markets since the early 1990s (Alfieri et al. 2007). Secondly, Mozambique has retained policies to keep trade flowing in basic staples with its neighbors, with Malawi being the most important export market for its agricultural commodities, especially maize. Third, southern Mozambique, with the capital Maputo, is structurally deficit in maize production and each year imports of maize from South Africa and elsewhere complement the maize from the central part of the country. This means that the north is often exporting maize at the same time that the south is importing, reflecting relative prices and transaction costs. Fourth, in urban Mozambique, low quality imported Asian rice (at least 25% broken rice) has become an important food staple for the poor since at least 2000. As indicated in Barslund (2007) based on data from 2002/2003, rice and wheat were much more important than maize in urban consumption in the south. However, since late 2007, rice is no longer cheaper per kilogram than second quality maize meal, such that demand for maize meal has risen, and domestic rice prices have not come down even as international price decline. In the north, cassava has been and remains the low-cost locally produced alternative in consumption. Arndt et al. (2008) evaluated the impact of the higher maize prices and found evidence that urban consumers and net grain buyers would suffer under the higher prices. Urban consumers, however, demonstrate a willingness to shift among commodities, looking for the lowest cost staple. Thus maize does not have the dominance in consumption patterns found in other countries in the region.

On the production side, fertilizer subsidies are being discussed, particularly in light of current high world prices for fertilizers, however less than 4% of Mozambican farmers currently use fertilizers and they are primarily used for cash crops such as cotton and tobacco, rather than food crops. Therefore, and in contrast to other countries in the region, high fertilizer prices are not likely to depress Mozambican food production in the short run, but will constrain production expansion and productivity enhancements in the longer run.

If the government and private sector do manage to improve access to seeds and fertilizers for improved varieties with resulting higher yields and higher production, there may be difficulties on the marketing side. The government has proposed building silos for increased storage and using public funds for the government to be the buyer of last resort, but those are not yet implemented. If the borders to Malawi are closed or if Malawi takes measures to become maize self-sufficient, northern Mozambican farmers may face excess supply and low



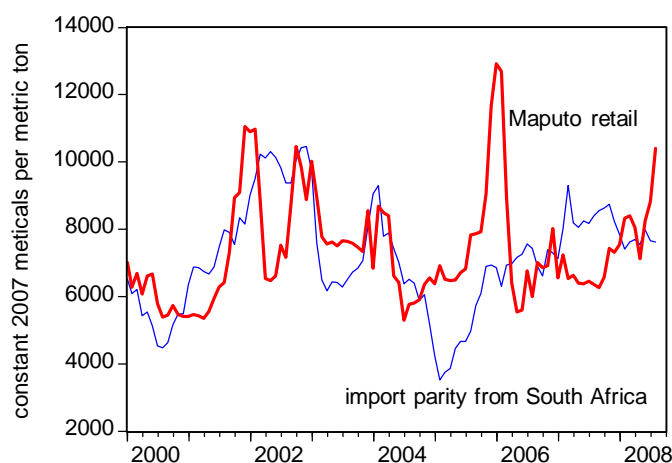
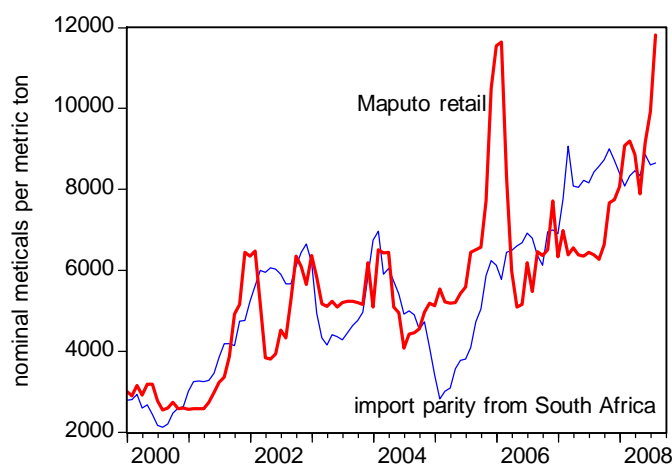
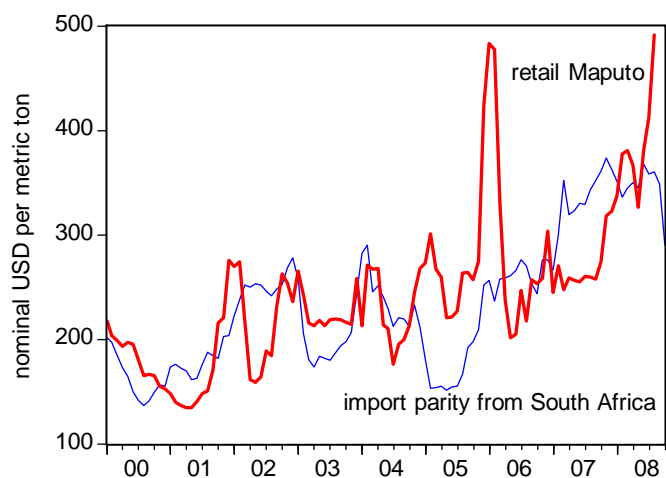
prices. So far, and including 2007 and 2008, Malawi has been the main importer of maize produced by Mozambican farmers (FEWS Net 2008a). Figures 6a, b, and c demonstrate the strong correlations between the prices in Nampula in northern Mozambique, and in Lunzu/Blantyre in Malawi. Traders in this region will quickly take advantage of cross-border opportunities, even when there are legal restrictions. If the transport sector improvements within Mozambique continue, the markets in the south will also become more linked to the northern markets and there would be an opportunity for greater entrance of northern supplies into southern markets, at prices below import parity.

The public sector strategy in Mozambique does not generally include trade restrictions beyond the import tariffs and VAT, although some local officials are putting in barriers to trade. The government included in its strategy a possible entrance into the market as a *buyer of last resort* but it is unlikely that the government will need to participate in the market, as there are not large quantities of farmer stocks left unpurchased, due to the increased demand in the markets. Price trends in the production areas have not demonstrated the seasonal lows expected and began increasing soon after the harvest, contrary to the usual trends (see Figures 6a, 6b, and 6c for Nampula, a maize surplus area in northern Mozambique). In June, private millers had already begun assessing import potential and were evaluating South Africa and other markets for import sourcing.

In the south, millers had already imported by September. The high maize grain prices in Maputo markets from November to March are expected each year, as this market is very thin, and so the high prices in late 2008 in Maputo are not unique. Millers typically rely on maize purchased during harvest season and otherwise rely on imports, not local markets. While there are tariffs and value added taxes to be paid on imported maize grain, large-scale millers can import directly for flour milling, and they are reimbursed the full value of the value added tax (VAT). Traders who import maize grain for direct sales into local markets are not reimbursed the VAT and thus maize grain import into local markets is rarely profitable. In addition, the structure of South African maize grain markets limits the ability of smaller traders to purchase grain for trade. Maize flour imports, formal or informal, are also rare due to high import tariff rates on flour compared to grain. The government chose not to move forward on removing VAT from flour or grain, so in the near future, imports from South Africa will continue to be conducted by large-scale processors importing grain for milling. Additional work is needed to understand why the lowering of South African maize prices in late 2008 does not translate into lower prices for maize flour on Maputo markets.

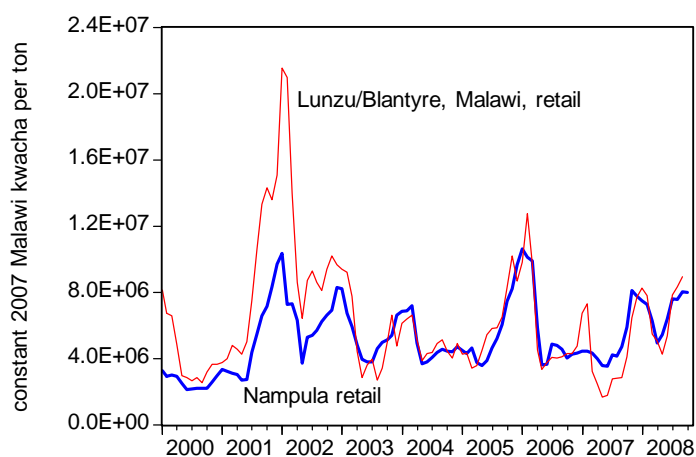
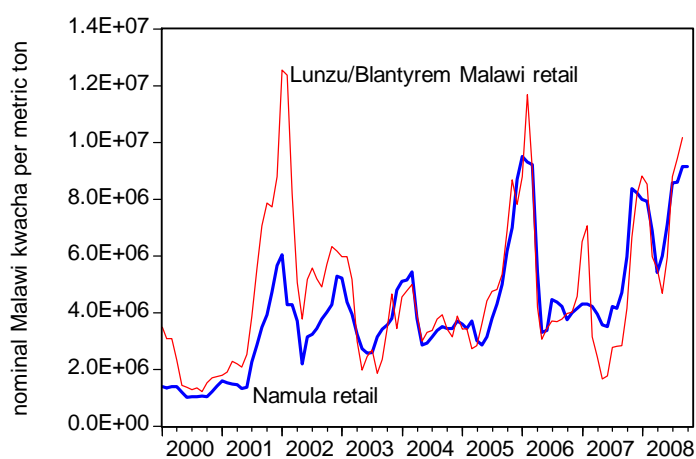
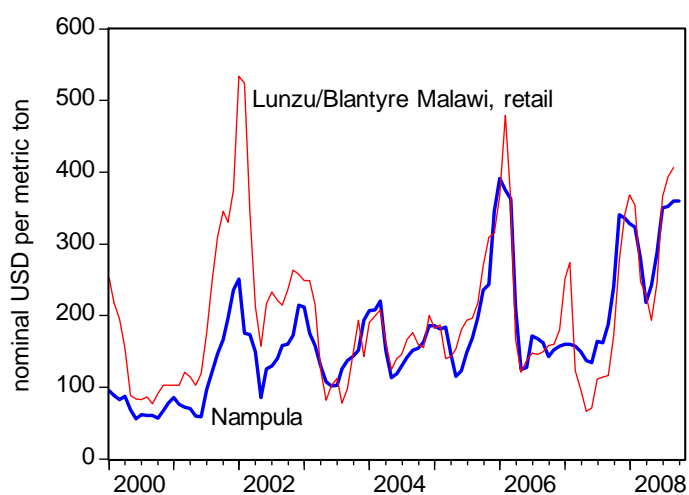
To understand the impact of the continued high prices on Mozambican consumers, it would be valuable to evaluate wages along with prices. Unfortunately, time series wage data are not currently available to understand the dynamics between the food price rises and possible increases in income. Analysts were able to evaluate food prices for May 2008 and the minimum wage for non-service sector employees for that period. Based on the cost of a minimum food basket for a family of five in Maputo, the minimum wage covered only 65% of the food basket, which does not include other necessities such as transport, housing, education and health care (Mabota et al. 2008). As Arndt et al. (2008) also demonstrate, minimum wages are not sufficient for urban households dealing with the high prices for food and for fuel.

**Figures 5a, 5b, and 5c. Maputo Retail Maize Prices vs. Import Parity from South Africa, 2000-2008, Nominal U.S. Dollars, Nominal Meticaais, and Real Meticaais Per Ton**



Note: The Mozambican currency changed from the old Meticaais (MT) to the Meticaais da Nova Familia (MTN) in 2006; all values in this report are reported in MTN for the convenience of readers, and converted at the rate of 1000 meticaais (adjusted to constant 2007 values) = 1 MTN.

**Figures 6a, 6b, and 6c. Nampula Retail Maize Prices vs. Lunzu/Blantyre, Malawi Retail, 2000-2008, Nominal U.S. Dollars, Nominal Meticaais, and Real Meticaais Per Ton**



#### 4.5. Implications of Maize Price Trends in the Region

In summary, five main observations flow from this 2008/09 maize market assessment of Kenya, Zambia, Malawi, and Mozambique:

1. *The southern Africa region as a whole appears to be in a maize deficit situation, which cannot be filled solely through cross-border trade.* Consequently imports from South Africa or the world market are likely to be required by early 2009. In recognition of this, markets in late 2008 are moving quickly toward an import parity pricing structure (SAFEX + transport costs). However, it is highly possible that maize prices may spiral much higher than import parity unless governments and private traders consult and harmonize their import plans. The region currently suffers from a dilemma in which traders will not arrange imports from South Africa or world markets unless they receive assurances from governments that they will be able to sell their maize at the cost of purchasing it in South Africa plus transport costs plus a reasonable return on the activity. But this is likely to result in a price that could be politically intolerable. Governments may, therefore, feel the need to subsidize retail maize and/or maize meal prices in late 2008/09, in which case they cannot depend on the private sector to import commercially. Under this scenario, government will need to arrange imports as soon as possible to avoid local shortages, panic, and potentially disastrous consequences for the poor and vulnerable. In Mozambique, government investments to lower transaction costs in trade will go far to increase imports and price responsiveness to lower world prices.
2. *Somewhat in contrast, the east Africa regional situation is less severe, despite the large 2008/09 food production shortfall projected in Kenya.* Both Uganda and Tanzania produced some surpluses that are flowing into Kenya despite the official export ban in Tanzania. As of August, 2008, Ugandan and Tanzanian prices were in the range of US\$220-US\$280/ton, while Kenya's prices are in the range of US\$320-US\$360/ton. The price surface in Ugandan and Tanzanian markets are at least US\$100/ton below levels currently prevailing in the southern African corridor of Malawi/Mozambique/Zambia. Still imports from the world market may be required to stabilize prices in Kenya too, especially by the middle of 2009 when supplies from the 2008 main season are likely to be depleted, but the markets in east Africa appear to be calmer.
3. *While world and South African maize prices have plunged precipitously between August and October 2008, this decline has not been reflected at all in the eastern and southern African markets examined.*
4. *Regional trade could be playing a larger role to relieve pressure on food prices.* Regional trade is impeded and made more costly due to export bans, harassment of traders at borders even where legal, and unclear rules leading to opportunistic rent generation on informal food trade.
5. *The lack of agreement over the need for maize imports in at least two countries in the region (Zambia and Malawi) and difficulties for planning in another (Mozambique) reflect growing doubts about the reliability of official maize production estimates.* Methods and procedures to improve the accuracy of these national production estimates are likely to provide greater confidence and consensus among public and private sector stakeholders over the potential need for imports and role for local purchases of food aid. More accurate production and food balance sheet estimates would also provide donors with better information on which to assess food assistance needs, and the extent to which food assistance should be procured through local purchase and/or imported food assistance. More timely coordination and consensus over the need for imports can then

facilitate early action if imports are indeed needed, which in turn would reduce the probability of a food crisis occurring.

In any case, maize industry stakeholders form their own assessments about the supply and demand balance. Price levels as of October 2008 in Malawi, Zambia, and southern Mozambique are now very close to import parity levels from South Africa, indicating the market has already made up its mind about the need for imports to these countries.

## **5. WHAT HAS ACCOUNTED FOR THE DRAMATIC RISE IN STAPLE MAIZE PRICES IN THE SOUTHERN AFRICA REGION?**

Maize prices in eastern and southern Africa have risen sharply starting in 2007 and have stayed high throughout the first nine months of 2008. This sharp rise in the regional maize price surface coincides with the dramatic rise in world food prices over the same period. While changing conditions in world markets are having an undeniable impact on prices in the region, other local factors appear to have been overlooked. In most southern African markets, the magnitude of the 2007/08 price rise has *exceeded* that of world markets.<sup>5</sup> Moreover, even though world maize prices have been tumbling from August-December 2008, local maize prices have continued to rise over this period. In our view, there are at least six local factors that have interacted with high world prices to produce even greater price rises in southern African markets.

### **5.1. The Transition of Both Eastern and Southern Africa into Structural Maize Importing Regions**

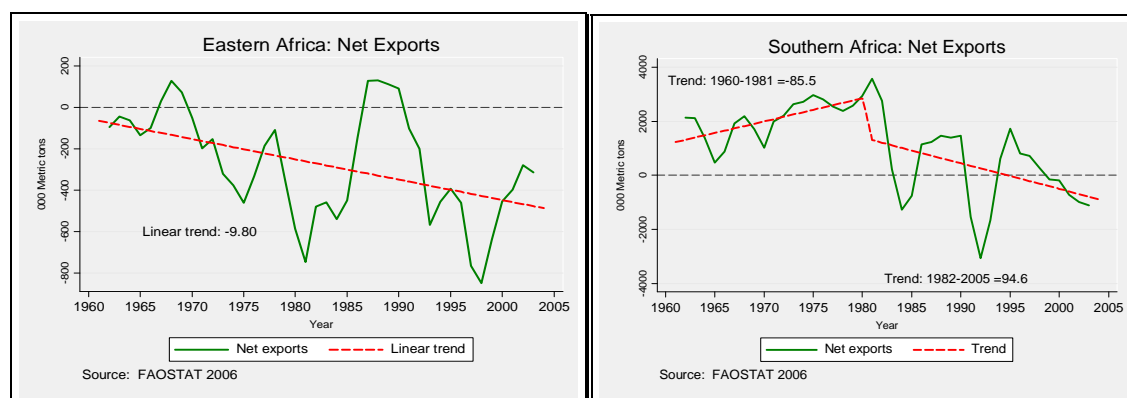
Jayne and Chapoto (2006) regressed regional and country-specific net export data from the Food and Agricultural Organization of the United Nations (FAO) on linear time trends, and on models allowing for shifts in the slope of the trend between the 1960-1981 and 1982-2005 periods. Net maize exports regressed on a linear time trend in the eastern and southern Africa regions<sup>6</sup> show statistically significant downward slopes (Figure 7). Net maize (grain plus meal) exports in the southern Africa region declined at a rate of -72,201 metric tons per year for the period 1960-2005. Net maize exports over the same period in east Africa declined at the rate of -9,798 metric tons per year. There is no significant difference in the trend in net exports in eastern Africa between 1960-1981 and 1982-2005. In southern Africa, the net export trends in the two periods are statistically different. Net exports in southern Africa increased by 85,544 metric tons per year for the period 1960-1980 and then declined by 94,586 metric tons per year during the period 1981-2005. At the country-level, there was a downward trend in net maize exports in all countries of southern Africa, with all of these being statistically significant at the 5% level. In east Africa, there was a significant downward trend in net maize exports for two of six of the east African countries (Kenya and Rwanda), while for Ethiopia the trend is positive and significant. The trend is weakly negative in Tanzania and weakly positive in the DRC. Kenya, Malawi and Zimbabwe, all net exporters of maize in the 1970s and 1980s, are now chronic importers. The reduction of maize production subsidies in South Africa has also reduced the exportable surplus in that country, although it remains a reliable exporter. These trends are putting upward pressure on maize prices as the region more frequently moves away from an export parity price structure and toward an import parity pricing structure.

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<sup>5</sup> See Table 1, column for (during the July-October 2008 period).

<sup>6</sup> Net exports are the difference between total exports and imports of maize grain and meal. Although FAO trade data do not capture unrecorded trade flows between countries, the net impact on regional net exports is zero, since each bag of unrecorded cross-border exports from one country in the region is imported by another country in the region. For the purposes of this paper, the southern Africa region consists of Zambia, Zimbabwe, Mozambique, South Africa, Botswana, Namibia, Lesotho, Swaziland and Malawi. East Africa includes Kenya, Uganda, Tanzania, Rwanda, Democratic Republic of Congo, and Ethiopia.

**Figure 7. Net Exports of Maize Grain and Maize Meal in East and Southern Africa**



Source: Reproduced from Jayne and Chapoto (2006), based on analysis of FAOStat data.

## 5.2. Sub-normal Maize Production in South Africa in the 2006 and 2007 Harvests

SAFEX maize prices already started rising sharply in 2006, well before the dramatic rise in world food prices. Both the 2006 and 2007 maize harvests were roughly 20% below normal, and the typical drop in prices after harvest did not occur in either 2006 or 2007. Because of the importance of South African maize production in the regional supply/demand balance, it is likely that maize deficit areas of the region began to incorporate these higher South African prices into their price structure even before the run-up in world food prices.

## 5.3. Aggressive Maize Procurement Campaigns by Both the Public and Private Sectors in 2008

Recognition of soaring world food prices and the belief that this was a long-term problem created nervousness in the markets and led some governments in the region to begin the 2008 harvest by aggressively procuring maize through their marketing boards to accumulate strategic stocks and avoid dependence on imports. At the start of the 2008 harvest, the Zambian Food Reserve Agency set a floor price of ZK 45,000 per 50kg bag, roughly US\$264 per ton. This price was substantially higher than the mean Lusaka retail maize price of US\$146 per ton over the 2000-2006 period. Private traders, millers and stock feeders also moved aggressively to procure supplies. Market prices quickly soared above the FRA buy price and have remained above throughout the 2008 season so far, even after the FRA increased its buying price to ZK 55,000/50kgs (US\$302 per ton) in September. A similar situation unfolded in Malawi. Even where the government did not engage in purchasing, as in Mozambique, the combination of new entrants in the markets, increased demand by existing traders, and the threat of high world prices resulted in increased competition for marketed quantities.

## 5.4. Underestimates of the Demand for Maize

There is some evidence of income growth in parts of the region. In Zambia, for example, real GDP per capita has risen by almost 30% between 2000 and 2008, and poverty rates have declined slightly. Growing livestock consumption and feed demand, and higher per capita incomes (fueled by the revived copper sector and booms in other primary commodities) has led to more meat and maize consumption, directly by consumers and indirectly in the form of

feedstock. These apparent increases in maize utilization have not been reflected in maize balance sheets, leading to a likely underestimate of consumption requirements. Moreover, demand for maize appears to be growing in the DRC, fueled by population growth and a similar mining boom there. Lastly, there has been a rapid rise in bread and rice prices, and the cost of calories in the form of these grains exceeds that of maize meal. Bread and maize meal (and rice along the coast) are substitutes in consumption especially in urban areas. Representatives of milling firms have reported major declines in the quantity demanded for bread, and it is likely that high bread prices have increased the demand for relatively less expensive maize meal. Rapid increases in rice prices have had the same effect in Maputo. For all these reasons, the supply/demand balance for maize is likely to be somewhat tighter than official balance sheets indicate, putting unexpected upward pressure on maize prices.

### **5.5. Unreliable Maize Production Estimates**

Few countries in the region develop estimates of annual maize production based on nationally representative surveys carried out by the national statistical agency. Zambia is a notable exception, but even here, survey-based estimates only pertain to the small- and medium-scale farm sector, not commercial production. There is a widespread perception that maize production estimates in Mozambique and Malawi are routinely overestimated and that political considerations may influence these estimates.

### **5.6. Trade Bans and Insufficient Coordination between the Private and Public Sector over the Need for Imports**

South Africa, being the largest maize producer and exporter of maize in the region, should continue to exert a major influence on prices throughout the region, especially in years when the region is in deficit and needs to import maize. Yet during 2006 and 2007, domestic maize prices in Zambia, Mozambique, and Malawi have been generally lower than import costs from South Africa. Why is this?

South Africa's market is much more strongly linked to world markets than are the markets in Zambia, Malawi, Zimbabwe, and even Mozambique; the latter are more insulated from world markets by transport costs, and also are unable to export into international markets due to deficient quality and contracting standards. A logical implication of this observation is that prices in South Africa should be more affected than those in other countries of the region by the world price boom. In fact, this pattern can already be seen. Shortly after prices in South Africa boomed in 2006, prices in Zambia, Malawi, and Mozambique all dropped below import parity (IPP) from South Africa until early 2008. This is the second longest and by far the most pronounced gap between local prices and IPP since at least 2000. This gap between interior country prices and South African prices reflects the fact that world prices have been more fully passed through to South African markets, that transport costs from South Africa to interior countries have risen dramatically, and that both the 2006 and 2007 South African maize harvests were below normal. Consequently, IPP is very much higher, implying more room for these countries to achieve national food security and mitigate the upward pressure on food prices if they can increase farm productivity and improve trade among themselves (Tschirley and Jayne 2007).

Instead of nurturing opportunities for increased trade among neighbors, however, most of these countries show signs of moving in the opposite direction. Zambia, Malawi, and Tanzania have all imposed export bans or trade restrictions on maize over the past 24 months to protect domestic supplies. Ironically in the case of southern Africa, these policies will



likely lead to more unstable supplies and prices for all concerned, as shown in Tschirley et al. 2006. While the informal trade tends to continue in the face of bans, the increased transaction costs inflate food prices for consumers and contribute to lower prices for farmers.

Export bans and other forms of trade barriers have also given rise to widening food prices within the interior markets. As of July 2008, maize retail prices in Lilongwe, Malawi were in the range of 52 kwacha per kg (i.e., US\$ 368 per ton) compared to prices between US\$ 240-290 in domestic markets in Zambia. These price gaps highlight the potential for regional trade to smooth out these price gaps and moderate the crisis in parts of the region where food prices are highest. However, opportunities to partially even out these price differences are being hindered by barriers to regional trade. Export bans and cumbersome procedures at border crossings impede the magnitude of cross-border trade by imposing additional transaction costs of smuggling, bribing police, and time delays. These costs raise food prices and exacerbate the crisis for consumers.

Perhaps more crucially for Zambia and Malawi, there are emerging signs that domestic maize supplies may be insufficient to satisfy demand before the availability of new supplies from the 2009 harvest. There is a growing consensus in Zambia (and sharply divided opinion in Malawi) that these countries will face enormous maize price increases during the forthcoming lean season between November 2008 and March 2009 due to demand outstripping available grain supplies on the market. The decision of the Malawi government to not issue import permits is likely to put upward price pressure on informal (ostensibly price-controlled) market prices through the coming lean season. In Zambia's case, the government has agreed to issue import licenses to private traders, but traders have asked for assurances that government will not also import and sell at a subsidized price to millers, which would expose them to financial losses. Lack of agreement between the government and private traders has, as of November 1, 2008, resulted in no formal arrangements for importation even though evidence is mounting that imports will be required.

By contrast, Mozambican private traders are already in discussions to bring in imports and government will not be hindering the trade either directly or indirectly. The government has so far refrained from taking measures to reduce consumer prices through lower import tariffs and value added taxes.

To conclude, there are many direct and indirect ways by which world food prices influence domestic interior markets, even if trade is not necessarily linking these markets physically. Yet to some extent, interior markets in eastern and southern Africa are de-linked from world markets due to high transport costs. These high transport costs build a wedge between import parity and export parity, leading to a range within which prices can fluctuate before triggering trade with world markets. Notably, in late 2007 and so far in 2008, none of the countries examine here have imported maize from international markets, and only Mozambique and Kenya have imported from South Africa. While the influence of international food prices on interior markets is complex, it also appears that the five factors highlighted above have also played an important role in escalating prices in many parts of the region.

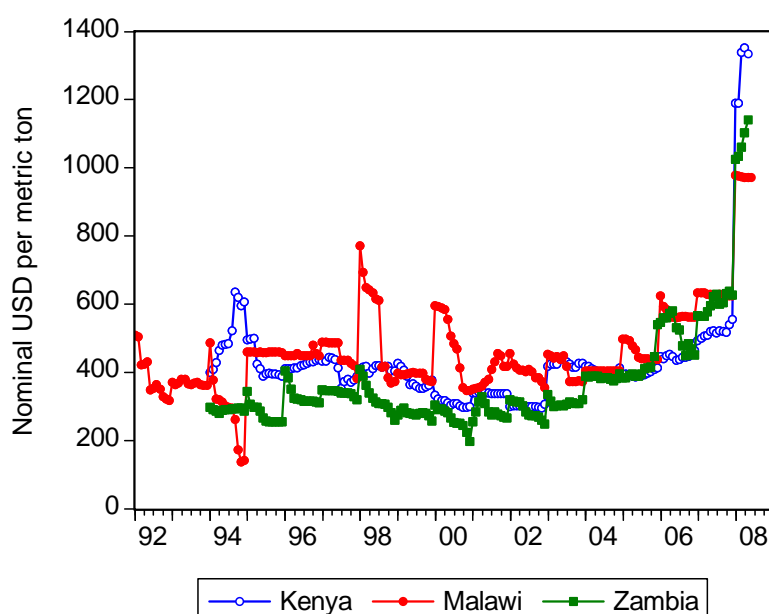
To summarize, these are: a) the sub-normal 2006 and 2007 maize harvests in South Africa; b) nervousness and uncertainty in the markets in 2008, on account of high international food prices, leading in some cases to aggressive purchase campaigns by the public sector in an attempt to build up national maize stocks, and in all cases to aggressive private sector purchasing; c) underestimated demand for maize; d) unreliable maize production estimates in some countries; and e) trade bans and/or poor coordination and consultation over the need for imports.

## 6. FERTILIZER PRICE TRENDS AND ANTICIPATED IMPACTS IN 2009

There has been a dramatic rise in fertilizer prices since 2007. Fertilizer prices in the various countries are not comparable because different types are used. In Malawi and Zambia, the main basal fertilizer for maize is NPK (23:21:0) and D Compound (20:10:10) respectively. By contrast, the main basal fertilizer for maize in Kenya is a relatively high-analysis DAP (18:46:0) which is more expensive on world markets. Figure 8 shows nominal U.S. dollar price trends for these three fertilizer types in these countries.

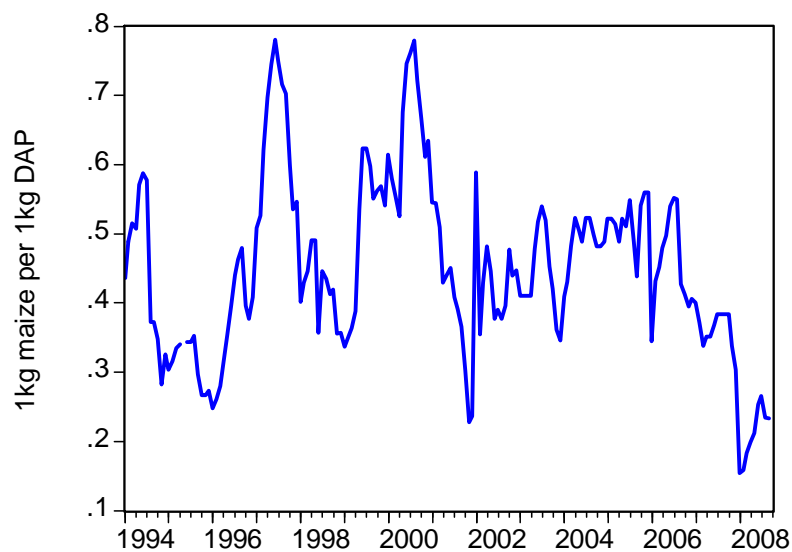
*Because of the currently very high fertilizer prices, there will almost definitely be a major drop in fertilizer use on staple food crops in the region in 2008.* Fertilizer prices in local currency units have risen proportionally higher than maize prices in the region and remain very high as of October 2008. Figures 9, 10 and 11 present trends in maize-fertilizer price ratios over the 1994-2008 period for Kenya, Zambia and Malawi. The 2008 maize-fertilizer price ratios are at all time lows in Kenya and Zambia. In Malawi, the relatively high price of maize in 2008 has partially offset the impact of rising fertilizer prices, and the anticipated expansion of the fertilizer subsidy program for 2008/09 is also likely to stabilize fertilizer use in Malawi.

**Figure 8. Fertilizer Prices, Kenya, Malawi, and Zambia, in Nominal US\$ Per Metric Ton**



Notes: fertilizer types are the most common basal planting fertilizer type for maize by smallholder farmers (DAP, cif Nakuru, Kenya; NPK (23:21:0) cif Central region of Malawi; D Compound cif Lusaka, Zambia). Sources: Local fertilizer prices obtained from Ministries of Agriculture in each country. Exchange rate information obtained from national statistics offices of each country.

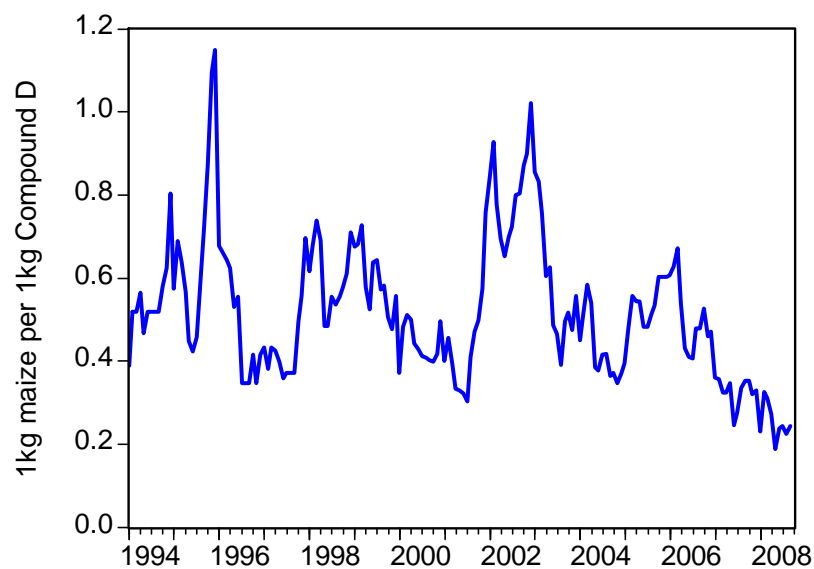
**Figure 9. Maize / Fertilizer Price Ratios, Kenya, 1994-2008**



Notes: Price ratio defined as wholesale market price per metric ton, Nakuru, divided by DAP, c.i.f. Nakuru per metric ton, in nominal shillings.

Sources: Ministry of Agriculture Market Information Bureau, Nairobi.

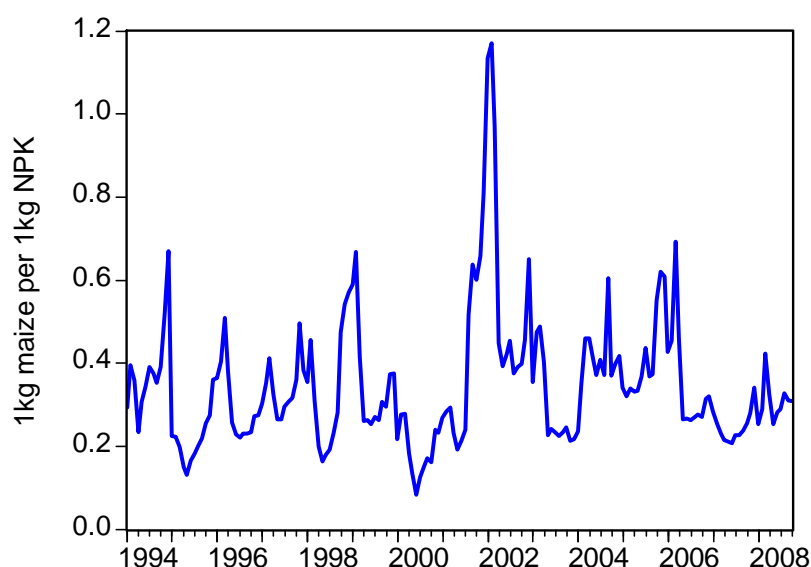
**Figure 10. Maize / Fertilizer Price Ratios, Zambia, 1995-2008**



Notes: Price ratio defined as retail market price per metric ton, Lusaka, divided by Compound D, c.i f. average of provincial centers per metric ton.

Sources: Omnia data files and Ministry of Agriculture and Cooperatives files for Compound D; CSO retail price data for maize prices.

**Figure 11. Maize / Fertilizer Price Ratios, Malawi, 1990-2008**



Notes: Price ratio defined as retail maize market price per kg, Lilongwe, divided by NPK (23:21:0 4s) c.i.f. Lilongwe per kg, in nominal kwacha.

Sources: FEWS Net reports for maize prices; Ministry of Agriculture for fertilizer prices, Lilongwe.

Relatively low maize-fertilizer price ratios in most of the rest of the region are likely to produce several unwelcome outcomes: (a) less fertilizer used on maize and other crops in the coming cropping season; (b) lower maize yields and production, other factors constant; (c) continued upward pressure on maize prices, even in countries that so far have not experienced major price increases; and (d) a possible shift in area out of crops that require heavy fertilization for profitability and into crops that are profitable even at low or no fertilizer use (e.g., a partial shift into roots and tubers at the expense of maize in the mixed cassava/maize zones, and a shift out of fertilizer-intensive cash crops such as tobacco and tea).

The impact of lower fertilizer use on maize production and marketed supplies will be most discernable in countries that make relatively intensive use of fertilizer such as Kenya and least so in countries where fertilizer use is negligible, such as Mozambique.<sup>7</sup> However, high fertilizer prices will limit expansion of production through technology adoption. For that reason, the Mozambican government is considering a fertilizer subsidy program similar to Malawi's starter pack program. Countries gearing up for large-scale fertilizer subsidy programs in 2008, such as Malawi, may also not be greatly affected in the short run. However, the impact of Malawi's subsidy program and the current ADMARC and NFRA operations associated with maize price stabilization are anticipated to impose massive fiscal costs on the treasury with potentially serious macroeconomic consequences that could indirectly affect livelihoods and food insecurity in 2009 and beyond.

As important as fertilizer use is in increasing food production over time, many other factors are of course crucial as well. Over the medium and longer-run, smallholder productivity and food security outcomes in the region will also depend on investments in seed research and other forms of crop science; farmer extension programs improve farmer knowledge and management practices; initiatives to organize farmers into viable groups for accessing

<sup>7</sup> In 2007, 70% of smallholder farmers in Kenya used fertilizer while only 4% of farmers in Mozambique did.

seasonal loans to finance crop input purchase, obtain support services (e.g., crop husbandry knowledge, conservation farming techniques and other viable agronomic practices, soil testing for fine-tuning efficient fertilizer use recommendations), and achieve scale economies in crop marketing; and investments in physical infrastructure, e.g., roads, electrification, port development, etc. For empirical estimates of how infrastructure investments affect agricultural productivity, see Antle (1983) and Binswanger, Khandker, and Rosenzweig (1993).

*High fertilizer prices in 2008 are likely to contribute to high food prices in 2009 in the region, even if world food prices continue to decline.* On the surface, it may be expected that the rapid decline in world food prices since mid-2008 should start to put downward pressure on maize prices in eastern and southern Africa. However, to the extent that very high fertilizer prices cause a major reduction in fertilizer use and maize production in the region, the price surface in many parts of the region may remain at import parity levels throughout much of 2009.

## 7. DISTRIBUTIONAL EFFECTS IN THE SHORT-RUN AND LONGER-RUN<sup>8</sup>

There has been considerable debate in the media and among researchers about the net impact of higher food prices on developing countries and the poor (e.g., see Ivanic and Martin 2008; Aksoy and Isik-Dikmelik 2008; Masters 2008; Polaski 2008; Rodrik 2008; Kelly, Dembele, and Staatz 2008; Arndt et al. 2008). The Economist Magazine in July 2008 conducted a debate and subsequent on-line poll on the issue of whether higher world food prices provided a net upside or downside to humanity.<sup>9</sup> According to the respondents who participated in the poll, 55% believed in a net upside while 45% did not.

The costs and benefits of a secular rise in world food prices are likely to differ greatly in the short run and the long run. Studies of structure of the rural population in eastern and southern Africa almost uniformly show wide disparities in farm size and assets across smallholder farms. The pattern of staple food production and marketing output is similarly highly concentrated (Table 2). In each of the countries for which survey data is available, small-scale farm households fall into one of the following four categories with respect to grain markets:

- i. sellers of staple grains:* Roughly 20-35% of the smallholder farms sell grain in a given year. Of course this figure will rise in good harvest years and fall in a drought year. However, there are two sub-groups within this category: (i) a very small group of relatively large and well-equipped smallholder farmers with 5-10 hectares of land, usually in the most favorable agro-ecological areas (about 1-4% of the total rural farm population), and (ii) a much larger group of smallholder farms (20-30% of the total rural farm population) selling much smaller quantities of grain, between 0.1 and 1 tons per farm. These households, especially the largest farmers, clearly benefit from higher grain prices.
- ii. buyers of staple grains:* These rural households generally make up 50-70% of the rural population, higher in drought years and lower in good production years. These households are generally poorer and have smaller farm sizes and asset holdings than the median rural household. They are directly hurt by higher mean grain prices.
- iii. households buying and selling grain within the same year:* In all of the nationwide surveys, relatively few households both buy and sell maize.<sup>10</sup> Only about 5-15% of the rural population buys and sells the main staple commodity in the same year. They comprise both relatively large farms that sell grain and buy back small quantities of processed meal, as well as relatively poor households that make distress sales of grain after harvest only to buy back larger later in the season. However, this latter sub-group typically comprises less than 10% of the rural farm population.
- iv. households neither buying nor selling maize:* These households make up a small proportion of the rural population. However, in parts of northern Zambia and Mozambique, cassava is the main staple. Because of this, a sizable fraction of the rural population at the national level is autarkic with respect to grain.

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<sup>8</sup> This section draws from Jayne 2008.

<sup>9</sup> See <http://www.economist.com/debate/overview/130>

<sup>10</sup> This empirical regularity contrasts with the common notion that, because of lack of credit, farmers typically sell at harvest at low prices and buy back later at higher prices.

**Table 2. Distribution of Small-scale Farm Population according to their Position in the Staple Grain Market, Selected Countries**

| Household category with respect to main staple grain: | Zambia (maize)                         | Mozambique (maize) | Kenya (maize) | Malawi (maize) | Ethiopia (maize and teff) |
|---|--|--------------------|---------------|----------------|---------------------------|
|   | ----- % of rural farm population ----- |                    |               |                |                           |
| Sellers only:   | 19                                     | 13                 | 18            | 7              | 13                        |
| top 50% of total sales*                               | 2                                      | 2                  | 2             | 1              | 2                         |
| bottom 50% of total sales**                           | 17                                     | 11                 | 16            | 6              | 11                        |
| Buyers only   | 33                                     | 51                 | 55            | 57             | 60                        |
| Buy and sell (net buyers)                             | 3                                      | 12***              | 7             | 4              | 13                        |
| Buy and sell (net sellers)                            | 6                                      |                    | 12            | 3              | 12                        |
| Neither buy nor sell                                  | 39                                     | 24                 | 8             | 29             | 2                         |
|   | 100%                                   | 100%               | 100%          | 100%           | 100%                      |

Notes: \* after ranking all households by quantity sold, this row shows the percentage of households in the smallholder sector accounting for the first 50% of total maize sale; \*\* percentage of households accounting for the remaining 50% of total maize sales. \*\*\*The survey in Mozambique was not able to ascertain quantities of maize purchased, therefore, whether these households are net buyers or net sellers is unknown. The survey years were 2003/04 for Zambia; 2004/05 for Mozambique; 2003/04 for Kenya; 2006/07 for Malawi and 1995/06 for Ethiopia. Source: reproduced from Jayne, Nijhoff, and Zulu (2006).

Staple grain sales tend to be highly concentrated among a relatively small number of large and commercialized farmers in the smallholder sector. Table 3 disaggregates smallholder households included in the nationwide surveys into three groups: 1) the largest smallholder sellers of maize who accounted for 50% of the marketed maize output; 2) the remaining households that sold maize during the year who accounted for the other 50% of the marketed output; and 3) those households that sold no maize during the 12-month marketing season.

As shown in Table 3, one or two percent of the farms account for 50% of the overall marketed maize surplus from the smallholder sector. These farm households appear to enjoy substantially higher welfare levels, in terms of asset holdings, crop income, and non-farm income, than the rest of the rural population. The relatively elite smallholder farmers had roughly 2 to 6 times as much land and productive assets as the non-selling households, 6 to 9 times more gross revenue from the sale of all crops, and 5 to 7 times as much total household income.

**Table 3. Characteristics of Smallholder Farmers Classified by Participation in the Maize Market, Zambia (2000/01), Mozambique (2002/03), Malawi (2003/04), and Kenya (1999/00)**

|  | Maize sellers                                     |                       | Households not selling maize |
|--|---|-----------------------|------------------------------|
|  | Farms accounting for top 50% of total maize sales | Rest of maize sellers |                              |
|  | (1)   | (2)                   | (3)                          |
| <i>Number of households</i>                    |   |                       |                              |
| Zambia (weighted)                              | 23,680 (2.2%)                                     | 234,988 (23%)         | 762,526 (75%)                |
| Mozambique (weighted)                          | 4,654 (1.0%)                                      | 654,771 (15%)         | 2,466,572 (83%)              |
| Kenya (unweighted)                             | 25 (1.7%)   | 535 (37%)             | 897 (61%)                    |
| Malawi (unweighted)                            | 13 (0.5%)   | 136 (11%)             | 2,301 (88%)                  |
| ----- Mean values -----                        |   |                       |                              |
| <i>Land holding size (hectares)</i>            |   |                       |                              |
| Zambia   | 6.00  | 3.91                  | 2.79                         |
| Mozambique                                     | 3.46  | 1.70                  | 1.60                         |
| Kenya  | 8.09  | 2.77                  | 1.56                         |
| Malawi   | 3.78  | 1.27                  | 0.98                         |
| <i>Value of farm assets (US\$)<sup>a</sup></i> |   |                       |                              |
| Zambia   | 1,558   | 541                   | 373                          |
| Mozambique                                     | 205   | 47                    | 62                           |
| Kenya  | 4,081   | 1,107                 | 617                          |
| Malawi   | 1,336   | 186                   | 154                          |
| <i>Total household income (US\$)</i>           |   |                       |                              |
| Zambia   | 2,282   | 629                   | 291                          |
| Mozambique                                     | 2,159   | 315                   | 328                          |
| Kenya  | 8,849   | 2,357                 | 1,565                        |
| Malawi   | 2,601   | 458                   | 308                          |
| <i>Total crop income (US\$)</i>                |   |                       |                              |
| Zambia   | 1,348   | 483                   | 233                          |
| Mozambique                                     | 1,247   | 176                   | 114                          |
| Kenya  | 5,479   | 1,147                 | 628                          |
| Malawi   | 1,445   | 144                   | 71                           |
| <i>Gross revenue, crop sales (US\$)</i>        |   |                       |                              |
| Zambia   | 823   | 135                   | 36                           |
| Mozambique                                     | 715   | 47                    | 20                           |
| Kenya  | 5,318   | 831                   | 419                          |
| Malawi   | 1,230   | 37                    | 32                           |

Notes: <sup>a</sup> livestock plus farm equipment except for Mozambique, which is livestock assets only.

Sources: Zambia: Supplemental Post Harvest Survey, Central Statistical Office, Lusaka, 2003/04. Kenya:

Tegemeo/Egerton Rural Survey, 2003/04. Mozambique: TIA, 2002/03, Ministry of Agriculture, Maputo.

Malawi: Integrated Household Survey-2, 2003/04 and 2002/03 seasons, National Statistical Office, Lilongwe.



When a broader set of staples are aggregated together (maize, cassava, sweet potato, millet and sorghum) more than 55% of the sales of staples are still accounted for by 10% of the farmers with the largest sales. This concentration of surplus production and marketing by a relatively few farmers is one of the most important points to be borne in mind when thinking about the effects of policy instruments designed to alter the mean level of food prices.

These findings hold several important policy implications. First, a rise in food prices is likely to transfer income from urban consumers and a large proportion of rural households who are net maize buyers to a much smaller proportion of relatively better-off farm households who are maize sellers. To the extent that the poor are net purchasers of staples such as maize, wheat, and rice, they are directly hurt by policies that raise prices of these commodities, at least in the short run.<sup>11</sup>

A second short-run implication of a secular rise in food prices in eastern and southern Africa is that the benefits are likely to be extremely concentrated. This conclusion flows from the finding that roughly 1% of farm households in account for 50% or more of the national marketed maize surplus.

### **7.1. Longer-run Distributional Effects of Higher Food Prices**

In the longer run, there is the potential for a secular increase in agricultural prices to catalyze new investment in farm technology and markets, to raise agricultural employment, and to generate new multiplier effects based on backward and forward linkages to the farm sector (Delgado, Hopkins, and Kelly 1998; Hazell and Haggblade 1993; Pingali, Raney, and Wiebe 2008). However, whether these potential multiplier effects are achieved depends crucially on higher prices attracting increased public goods investments.

Substantial research has documented the importance of public goods investments on smallholder productivity, such as improved seed generation and other types of crop science, innovative extension programs to improve farmers' management practices, and the generation and dissemination of accurate crop production forecasts and price information. The costs and risks faced by actors in the food systems and the rate of investment in food value chains are affected by the rate of investment in these public goods as well as by policy choices.

If public goods investments are so important in improving the performance of strategically important food markets, then why have relatively small portions of government budgets been devoted to these investments? For example, during the past five years, 10% or less of the Government of Zambia's budget allocation to the agricultural sector has been devoted to crop science, extension services, irrigation, and other activities with clear public goods characteristics. Over 60% of the government's agricultural budget has consistently been spent on fertilizer subsidies and maize price stabilization operations (Govereh et al. 2006). In a recent article entitled "Under-investing in public goods: evidence, causes, and consequences for agricultural development, equity, and the environment," Lopez (2003) uses a political economy framework to show that unequal competition in the political lobby market causes the allocation of public expenditures to be biased in favor of private goods (such as input subsidies) that can be captured by politically influential groups and against the

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<sup>11</sup> Of course, a general equilibrium approach, taking into account indirect effects on welfare through labor market effects, would need to be undertaken before the welfare effects of mean-altering price policies could be fully understood.

provision of public goods that would improve the overall performance of markets and thus have broad-based benefits for the poor. Other scholars describe the political landscape in much of Africa as being dominated by neo-patrimonial relationships, in which government commodity distribution is an important tool by which leaders maintain loyalty and patronage among rural leaders and their constituents (van de Walle 2001; Bird, Booth, and Pratt 2003; Pletcher 2000). Even without resorting to neo-patrimonial arguments, it is clear that the next election provides incentives for policy makers' budget allocation decisions to be influenced by what can be achieved in the short run. Unfortunately, the payoffs from many public goods investments accumulate over the long run. The high food marketing costs and risks currently observed in most of eastern and southern Africa reflect low investment in market-facilitating public goods in prior decades. The challenge is how to provide incentives to influence the public budget allocation process in favor of greater expenditures on public goods that can generate a stream of large social benefits over time but which might not begin to manifest until three, five, or ten years later.

In the longer-run, the brightest prospect for many smallholders' escape from poverty (which is by no means a sure thing) is likely to involve being *pulled* off the farm into productive non-farm sectors. But allowing the most marginal farmers to escape from poverty, agriculture will require agricultural growth in order to generate the demand for non-farm employment. Abundant evidence of the transformation process elsewhere indicates that growth in non-farm sectors typically starts from a robust stimulus to agriculture, which generates rural purchasing power for goods and services. For many African countries, this implies increased crop productivity in order to increase household disposable income for non-staple crops and consumer goods. During this process, there will be high payoffs to education, as the most highly skilled households have the best access to the well-paying non-farm jobs. Therefore, while greater equity in land allocation and increased food crop productivity are both critical to rural poverty reduction in the short run, an important long run goal may be to enable the rural poor to access skilled off-farm jobs through investments and policies that support the processes of structural transformation. Education, which played an important role in Asia by allowing households to exit agriculture into more lucrative off-farm jobs, is relatively low in most areas of rural Africa by world standards. Investments in rural education and communications are likely to become increasingly important to facilitate structural transformation. Yet the payoffs to education will depend on non-farm job opportunities, which is ultimately dependent on broad-based agricultural growth. This brings us back to the centrality of basic public goods investments and supportive policies. The future evolution of food systems, and smallholder farmers' roles in them, will be fundamentally influenced by governments' commitment to smallholder farmers and poverty reduction, manifested through its policy choices and the composition and extent of its public goods investments to agriculture.

## 8. CONCLUSIONS AND IMPLICATIONS FOR AGRICULTURAL AND FOOD SECURITY POLICY

### 8.1. Nine Main Conclusions Highlighted

Analysis of maize price movements, national production and food balance sheets, and interviews with key informants in the region highlight nine main conclusions.

1. *Maize prices in eastern and southern region in nominal US\$ terms have indeed risen since 2005 but in a dramatic sense only since mid-2007.* Rising dollar-denominated maize prices in the region have coincided with -- and in some cases preceded -- the major rise in world food prices. The upward maize price movements in South Africa actually preceded the rise in world maize prices due to relatively poor maize harvests in South Africa in both 2006 and 2007. While world and South African maize prices have plunged precipitously between August and December 2008, this decline has not been reflected at all in the eastern and southern African markets examined. In parts of the region, most notably Malawi, maize prices have continued to rise throughout 2008 and are now substantially higher than the cost of importing maize from South Africa. Despite the gains in consumer welfare that would result from importing maize at this time, imports are not being arranged. While the rise in world food prices had an undeniable impact on maize prices in the region up till mid-2008, the continued rise in food prices in countries such as Malawi and Zambia during the latter half of 2008 is primarily due to local policy-related factors.
2. *When measured in real local currency units, the picture is different. Maize prices in 2007 and 2008 have risen in some areas (Malawi, Mozambique, and South Africa) but more gradually than when examined in nominal US\$. In other countries, (Zambia and Kenya) real maize prices have actually fallen.* Notwithstanding the recent increase in maize prices throughout the region when examined in nominal US\$, nowhere in the region are current maize prices abnormally high in real local currency units. In fact, constant maize grain prices in between January 2007 and June 2008 in Nairobi and Lusaka are actually lower than their mean levels between 1995 to 2006 (Figures 6a, 6b and 7).

However, tracking food prices in inflation-adjusted terms may underestimate the degree of vulnerability faced by low-income consumers during episodes with general price inflation is high. A low *real* maize price, defined as the nominal maize price divided by a general consumer price index, simply means that maize prices have risen no faster than fuel and other prices in the economy, some of which have risen very rapidly indeed.

The difference in maize price trends involves exchange rates. The Zambian kwacha and Kenyan shilling have both appreciated by 20% or more against the dollar in the past several years, particularly in 2007 and early 2008 for reasons described earlier having to do with expansionary U.S. monetary policy. By contrast, currencies in South Africa, Mozambique and Malawi have stayed roughly constant with the U.S. dollar in recent years. A second reason for the divergent picture is because trends in U.S. dollar food prices are commonly examined without being deflated. Though inflation in the U.S. has been relative low throughout the 2000s, the general price level has certainly moved upward over time, hence examining price trends without deflating is likely to provide the appearance of food price inflation although relative to all other prices of goods and services in the economy food prices could actually be declining. A third factor responsible for the downward trend in maize and maize meal prices over the past decade

in Kenya and Zambia has been market reform, which has reduced the marketing and milling costs significantly in these countries.

3. *At least in Zambia, wage rates have increased faster than food prices over the past decade, although some ground has been lost in 2008.* Trends in wage rates relative to maize prices could only be assessed in Zambia due to unavailability of wage data in the other countries. The Zambian case indicates that wage rates have increased faster than maize prices between 2002 and 2007, essentially tripling the amount of maize government employees could buy on the average daily wage. This trend was partially reversed in late 2007 and into 2008. However, the kilograms of maize that can be purchased by government employees on average in 2008 is at least twice as much as during the 1994-2002 period.

Hence, we conclude that real maize price trends are highly variable, with the trend depending on structural trends in crop production and productivity relative to demand growth, changes over time in maize marketing costs, and macroeconomic factors affecting exchange rates.

4. *While world and South African maize prices have plunged precipitously between August and October 2008, this decline has not been reflected at all in the eastern and southern African markets examined.* On the surface, it may be expected that the rapid decline in world food prices since mid-2008 should start to put downward pressure on maize prices in eastern and southern Africa. However, to the extent that very high fertilizer prices depress fertilizer use and maize production in the region in 2009, the price surface in many parts of the region may remain at import parity levels throughout much of 2009.
5. *There is some evidence of a potential food crisis emerging in Zambia and possibly Malawi in early 2009, not because world food prices are abnormally high, but because tight market conditions are leading to abnormally high local food prices.* In both countries, maize grain prices have topped US\$500 per ton in parts of the country. Despite the fact that local prices greatly exceed the cost of importing maize from South Africa, imports are not being arranged in Malawi, and has only just been initiated in Zambia as of December 2008. By contrast, Kenya and Mozambique have imported maize in 2008 relatively smoothly and price levels in these countries are substantially lower than those in Zambia and Malawi.
6. *Opportunities to relieve maize deficits in the region and partially stabilize prices are being hindered by barriers to regional trade.* Regional trade could be playing a larger role in delivering maize supplies to areas of the region where prices have escalated the most. Instead of nurturing opportunities for increased trade among neighbors, however, most of the countries examined show signs of moving in the opposite direction. Zambia, Malawi, and Tanzania have all imposed export bans or trade restrictions on maize over the past 24 months to protect domestic supplies. While trade bans do not stop trade across borders, they do increase the transaction costs associated with it, thereby inflating food prices for consumers and contributing to lower prices for farmers.

Especially in the near future, however, trade will be insufficient to ensure low-income households' access to food. In the three countries where real food prices have indeed risen the most (Malawi, Zambia, and Mozambique), many low-income households will have particular trouble meeting their food needs, thus requiring expanded targeted food assistance programs in 2009 and possibly beyond.

7. *Events in 2007 and 2008 are underscoring the crucial importance of timely crop production and market information systems.* It is becoming increasingly clear that national crop estimates in some countries are unreliable. Price stability in the region requires accurate crop forecasts, since so many other private and public sector decisions hinge on these estimates. Mistakes in crop estimates can produce disastrous consequences. For example, on the basis of the Government of Malawi's forecast of a record maize harvest in 2007, the government contracted with other governments in the region to export over 400,000 tons of maize. However, the government was only able to source some 300,000 tons and this sent the price of maize rocketing to levels seen only in the most severe drought years. In hindsight, it is widely believed that the 2007 Malawi harvest was overestimated by at least 25%. If the government had been able to produce a more accurate estimate of crop production, it might not have arranged to export maize, which in turn might have avoided the huge price run up in late 2007/early 2008 which caused great hardship for maize buying households.

Monitoring of wholesale and retail food prices allows policy makers to understand the differential price responses being observed in the region. However, there is also a major weakness: so far, these systems are generally not equipped to provide accurate information on producer prices, which would otherwise provide the means to assess whether higher food prices are translating into higher prices at the farm gate. Anecdotal reports indicate that indeed farm gate prices are rising along with observed retail grain prices. The distributional effects of higher food prices are the subject of debate, but the weight of the evidence indicates that rural poverty is likely to rise at least in the short run.

8. *The role of cassava in stabilizing food consumption and supporting food security may become evident in 2009.* This is especially true if isolated maize shortages begin to occur in parts of southern Africa as anticipated before the start of the 2009 harvest. Regions where there are major stocks of cassava in the ground are likely to weather the potential food insecurity storm much better than in regions where there is only limited potential for substitution in consumption between maize and relatively inexpensive staples such as cassava.
9. *There will almost definitely be a major drop in fertilizer use on staple food crops in the region in 2008.* Fertilizer prices in local currency units have risen proportionally higher than maize prices in the region and remain very high as of October 2008. Relatively low maize-fertilizer price ratios are likely to produce several unwelcome outcomes: (a) less fertilizer used on maize and other crops in the coming cropping season; (b) lower maize yields and production, other factors constant; (c) continued upward pressure on maize prices, even in countries that so far have not experienced major price increases; and (d) a possible shift in area out of crops that require heavy fertilization for profitability and into crops that are profitable even at low or no fertilizer use (e.g., a partial shift into roots and tubers at the expense of maize in the mixed cassava/maize zones, and a shift out of fertilizer-intensive cash crops such as tobacco and tea).

## 8.2. Response Options for Consideration by Governments and International Agencies

The main implications for governments and donors are that the fundamental issues that have always been the major determinants of smallholder livelihoods and incomes remain front and center today. While rising food prices are currently being perceived as a *crisis*, in the long run higher average food prices (compared to levels over the past two decades) may bring major opportunities to attract investment in food production and marketing in the region to expand agricultural growth. However, exploiting these opportunities will require a hospitable and predictable investment climate, and moving toward this hospitable investment climate will require some governments in the region to adopt more stable, predictable and transparent behavior in maize and fertilizer markets. A hospitable climate for domestic and international investment in food production and marketing will also require greater public investment in areas that reduce marketing and production costs: physical infrastructure, crop science, programs that effectively transfer improved crop husbandry knowledge to farmers, and effective organization of small-scale farmers into groups.

## 8.3. Some Specific Proposals for Consideration Would Include

1. *Create a forum for regular consultation and coordination between the private and public sectors to manage the potential need for maize imports and exports.* There is an urgent need for timely information on price movements, stock levels, and trade flows to serve as the basis for discussion between public and private sector stakeholders. Accurate information plus frequent communication is required for a coordinated private and public sector response to mitigate the chances of a food crisis. In the case of Zambia and possibly Malawi, there is an urgent need to critically assess the need for maize importation to avoid a food crisis in early 2009.
2. *Invest in an improved crop production forecasting system to serve as a foundation for improved consultation and coordination between the public and private sectors.* Currently, crop forecasting in much of the region is unreliable. Zambia, for example, is unable to estimate maize production from the large-scale farming sector. There is mounting evidence that the national maize forecasts in Malawi and Mozambique are overestimated, perhaps greatly. Unreliable crop estimates inject a great deal of guesswork into the food balance sheets that governments use to estimate import requirements and/or export potential, which in turn increases the probability of undershooting or overshooting import requirements and the wide price swings commonly associated with them. Relatively inexpensive investments in improved crop production estimates could greatly reduce the probability of future food crises.
3. *Eliminate maize export bans, import tariff rates, and licensing requirements for trade with the region.* These proposed changes will stabilize supplies within the region and benefit farmers and consumers in the long run. Tariffs and other trade policy instruments may still be appropriate *vis a vis* international markets. However, when food prices are abnormally high in the entire region, there appears to be little merit in maintaining barriers to importation.
4. *Focus government budgets on cost-reducing public investments to support the development of input and output markets and smallholder farm productivity.* Such investments would include:

- i) Human and financial resources dedicated towards seed varietal development, improved soil fertility management, and other crop management activities to raise smallholder farm productivity, investments that Mozambique's government has committed itself to making;
- ii) Seed system development initiatives, based on either private sector leadership or public/private partnerships;
- iii) Farmer extension programs: weak public programs to improve farmer knowledge and management practices are dragging down the potential for farm productivity growth in many countries in the region (World Bank 2008). As demonstrated in Zambia, public sector extension workers are largely preoccupied with distributing subsidized fertilizer or other inputs or recovering loan repayments for public sector programs. It is often NGO extension agents that interact with smallholder farmers to improve their crop husbandry practices and to raise the efficiency of their use of fertilizer, rather than the public sector extension service. For example, extension on conservation farming is currently confined to donor supported organizations. The substantial variation in maize yields even within villages as commonly observed in household survey data attest to the productivity growth that could be achieved simply by raising the yields and fertilizer response rates of the bottom half of the farmers to match mean levels achieved in each village;
- iv) Initiatives to organize farmers into viable groups for accessing seasonal loans to finance crop input purchase, obtaining support services (e.g., crop husbandry knowledge, conservation farming techniques and other viable agronomic practices, soil testing for fine-tuning efficient fertilizer use recommendations), and achieving scale economies in crop marketing. Major progress in organizing grass-roots farmer groups to access knowledge, financing and inputs has been made in Kenya through the Kenya Market Development Programme, and the benefits being achieved there provide a blueprint for wider replication throughout the region;
- v) Public goods investments in physical infrastructure, e.g., roads, electrification, and port development; and
- vi) Stable state institutions to support commerce and private investment. Providing a stable institutional environment is critical for private investment in communications, means of transport, storage, and other investments complementary to the public investments listed above.

While calls for increased investments in these areas are not new, their high payoffs have been well documented in the Asian green revolution experience (see Fan, Gulati, and Thorat 2007) and continue to be major priorities for agricultural growth and food security in most of Africa.

5. *What about food aid?* If higher real food prices are going to be a reality in eastern and southern Africa (as yet still not entirely clear), then increased food assistance is going to be more important in the future. Under this scenario, the issue of how best to acquire needed food and how to distribute it will be even more important than in the past. Maxwell, Lentz, and Barrett (2007) provide a useful decision-tree approach for examining the pros and cons of alternative food assistance response modalities under various scenarios. Another option for addressing transitory food insecurity is to provide cash subsidies to the most vulnerable households, as with the Food Subsidy Programme in Mozambique. However, the appropriate mix of local purchase, cash transfers, and

imported food assistance should be approached with great care on a case-by-case basis. For example, in an environment of high food prices, import restrictions, and high domestic trade costs, a major cash transfer program may be inflationary and exacerbate access to food for low-income households not participating in the program.

6. *International donors and NGOs should resist jumping reflexively to “do something” about the perceived crisis.* Well meaning but hasty efforts to quickly alleviate problems can result in the “Law of Unintended Consequences,” for which there is a long empirical history (Easterly 2006).

7. *Also important is to encourage rigorous analysis of the likely impacts on global and regional food security of subsidized production of food-based biofuels by relatively rich countries.*





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