24 November 1999 **flash ...** No. 18e

Resultados das investigações do Departamento de Análise de Políticas
MAP-Direcção de Economía*

The Effects of Maize Trade with Malawi on Price Levels in Mozambique: Implications for Trade and Development Policy

Ana Paula Santos and David L. Tschirley*

Introduction

Mozambique emerged from a 15 year civil war in 1992 and held its first successful democratic elections in 1994. Since that time, it has aggressively liberalized its economy. In agriculture, it eliminated nearly all fixed prices, slashed support to the cereals marketing parastatal, and ended restrictions on external trade for most commodities.

The effects of such liberalization measures on the poor are hotly debated throughout Africa, including in Mozambique. The country's macroeconomic performance during the liberalization period has been exceptional, with low and stable inflation, falling interest rates, and some of the highest economic growth rates in Africa. Yet the fact that this growth started from an extremely low base and occurred during the first peaceful period in 15 years makes it difficult to determine the relationship between this growth and the new economic policies that the country was pursuing.

This paper sheds light on one aspect of this important issue, evaluating the impacts of the opening of trade in maize with Malawi on producer and consumer maize prices in selected markets of Mozambique.

---

* The opinions expressed here are the entire responsibility of the Policy Analysis Department and do not reflect the official position of the Ministry of Agriculture and Fisheries.

This *flash* is based on MAF/MSU Research Report No. 34 - *The Effects of Maize Trade with Malawi on Price Levels in Mozambique: Implications for Trade and Development Policy*. It is available from the Direcção de Economía, MAP, or can be downloaded along with other MSU publications at: http://www.aec.msu.edu/agecon/fs2/mozambique

Background

Rationale for free food trade in Mozambique: Mozambique's geography makes the issue of trade liberalization especially pertinent. First, the country has a long seacoast, with three excellent natural ports spread along its length, and railroads linking these ports with its own interior and with neighboring countries.[1] Second, the most productive area of the country is in the North, but this region is separated from the key domestic consumption centers (Beira in the Center and Maputo in the South) by long distances, an under-developed system of feeder roads, poor north-south road links, and a high-cost coastal shipping industry. These characteristics result in very high costs of supplying the Center and South of the country and, consequently, very low prices to producers when such trade does occur.

Description of retail markets: Principal consumer markets in the country are Maputo in the south, Beira in the center, and Nampula in the north. ***Maputo*** is the largest city in the country. The city is fed by maize grain from the center of Mozambique, and grain and meal imported from South Africa. ***Beira*** is located on the coast at the end of the Beira Corridor linking the city with Zimbabwe. This city is typically fed by surpluses from the central provinces of Sofala and, especially, Manica, but is strongly affected by fluctuations in regional production. ***Nampula City*** is the largest urban center in the north and is supplied primarily by production from its own province, sometimes receiving grain from northern Zambêzia.

Description of producer markets: ***Manica*** market near Zimbabwe at the end of the Beira Corridor is a surplus production area with some of the highest maize yields in the country. This market is well integrated with the south of Mozambique (Donovan, 1995), supplying Beira, Maputo, and consumption centers in-between in addition to meeting its own needs during most years. ***Mocuba*** is located in the central-northern province of Zambézia, with good

agro-climatic conditions for maize production. Mocuba is an important transit point for maize, cassava, pigeon pea and butter beans to others districts and to Malawi. Only during food deficit years is it economical for Mocuba to sell maize in the southern areas of the country. In recent years with the opening of trade to Malawi the importance of the Mocuba market has increase as a wholesale distribution point for traders. ***Ribaué*** is characterized by generally good agro climatic conditions very similar to the north of Malawi. Ribaué supplies deficit areas within the province, including Nampula City and some areas of the neighboring province of Cabo Delgado. There is weak linkage between this production area and the center and south, since this zone is very far from Beira and Maputo and the road links are poor. With the opening of trade with Malawi, this area became a major assembly point for traders exporting to southern Malawi.

Recent developments in the maize trade: Formal and informal trade between Mozambique and Malawi have been ongoing for several years (Macamo, 1998; Tickner, 1997; Bowen, 1998; Whiteside, 1998). However, this trade was relatively small scale and the effects of exports were felt primarily along the border until the 1997/98 marketing season. Production in Malawi in 1997 fell by 34%, and ADMARC and private traders suddenly looked to Mozambique to cover the deficit.

In response,Mozambican formal sector wholesalers entered the maize trade, many for the first time,along with the *Instituto de Cereais de Moçambique*. Officially registered exports to Malawi surged during the third quarter of 1997, and have remained at high levels through the end of 1998, almost entirely replacing exports to other countries. Total official exports to Malawi out of the 1997 harvest were nearly 42,000 metric tons; exports out of the 1998 harvest have continued at a slightly slower pace. Estimates of total formal and informal exports during the 1997/98 marketing year approach 100,000 mt. Exports continued at slightly slower pace first half of 1998/99. These factors pushed the effects of the trade far beyond the border areas. These flows had profound effects on prices in Central and Northern Mozambique; the next section presents the results of econometric modeling work to quantify these effects.

Model and Results

To test the effect of the opening of trade with Malawi on price levels in Mozambique, an econometric model was developed and estimated.[2] The general model is:

$$PRICE_{m,y} = f(PRODREG_y, PRODMOZ_y, FAMOZ_y, TRADE, S_m)$$

Where $PRICE_{m,y}$ is the white maize price during month *m* of year *y*, in real meticais, $PRODREG_y$ is total white maize production during year *y* in South Africa, Swaziland, Lesotho, Zimbabwe, Zambia, and Malawi, $PRODMOZ_y$ is domestic production of white maize during year *y*, $FAMOZ_y$ is domestic maize food aid arrivals during year *y* (white and yellow), TRADE is a dichotomous variable representing trade with Malawi, equal to zero through July 1997, equal to 1 from August 1997 forward, and
$S_m$is a vector of 11 monthly dichotomous variables, to control for seasonal effects.

Table 1 presents the results of this model, expressed as the percent increase in prices due to trade with Malawi. In general, both producer and consumer prices in the north of the country were substantially affected by trade, while neither was affected in the center and south of the country.

Discussion

Since most producers live in the north, while most consumers live in the center and south, these results indicate that maize exports benefit most rural households while having no negative effect on most consumers. Mozambique (see the final section of this paper).

Table 1. Percentage impact of maize trade with Malawi on selected producer and retail prices in Mozambique

Markets	% increase in price from trade with Malawi
Producer	
Manica	not statistically significant
Mocuba	21%
Ribaue	15%
Retail	
Nampula	13%
Beira	not statistically significant
Maputo	not statistically significant

The impact of trade with Malawi during the period under analysis was extremely important to producers. In 1996, Nampula and Zambezia provinces contained

37% of all maize producers in the country, and accounted for 40% of all maize sales (1996 National Agricultural Survey). Available data suggest that the percentage of net buyers of maize in rural areas is low: during the 1994/95 marketing year, between 12% and 25% of all households in surveyed areas of Nampula and southern Cabo Delgado province were net maize buyers. With large increases in maize production since that time, it is likely that these figures have not increased significantly, meaning that large majorities of rural households benefitted from these price increases.

Table 2 presents the increase in value of production and cash earnings from sales due to trade with Malawi during the 1998/99 marketing year. In Nampula the increase in earnings from maize sales was US$1,264,000 and in Zambezia was US$2,219,000, a total of nearly US$3.5 million in increased cash income in the two provinces due to the price increases. Increases during the 1997/98 marketing year would have been similar, though household level data are not available to estimate them precisely. These increased earnings have an impact on the broader rural economy through consumption multipliers and through the self-financing of rural micro enterprise activities. Haggblade, et al. (1989) estimate average growth multipliers in rural Africa of 1.5. In this case, such a multiplier implies nearly US$1.75 million in *additional* income through respending during each of the two years that this trade took place.

The producer level price impacts of trade with Malawi have potentially important implications for the intensification of maize production in Mozambique. Studies to date (Howard et al. 1999) calculate break-even prices at mean yields for high external input technology (HEIT) maize in the better agroecological zones of US$50-69/metric ton. During the period of exports to Malawi (since August 1997), 88% of all monthly producer prices in the four markets have exceeded US$69/ton; 94% have exceeded US$50/ton. These prices have obtained despite very good production in Mozambique and no serious shortages in the region. By increasing the probability of remunerative prices even during years of regional surplus, the development of regional markets will reduce the risk of adopting these technologies.

Table 2. Increases in value of maize production and cash earnings from maize sales due to trade with Malawi, 1998/99 marketing season [1]

Province	Increase in total value of maize production ('000 US$)	Increase in cash earnings from maize sales ('000 US$)
Nampula	1961	677
Zambêzia	3061	827
Manica	0	0

Source: MSU/USAID Focus Area Income Survey
Notes:1) Price increase due to trade is taken as the estimated regression parameter from the opening of trade regressions: 205 Mts/kg in Nampula, 332 Mts/kg in Zambêzia (Mocuba market), 0 in Manica (coefficient on TRADE was insignificant).

Even if the long-run trend in Malawi is toward a structural deficit in maize, however, Mozambique cannot necessarily rely on that market every year. Malawian production in 1999 is forecast to have increased by 34% and Northern Mozambique also is forecasted to have a very good harvest for this year. It remains too early to predict the impacts of these developments, but there are indications that some large wholesalers involved in the maize export trade over the past two years are avoiding it this year.

Too, as production in Mozambique continues to increase (especially if HEIT technologies become more widely adopted), the Malawi market may not be large enough to absorb all of Mozambique's exportable surplus. So, Mozambique needs to look beyond Malawi to other areas in the region which will periodically require imports, such as Zimbabwe, eastern Zambia, Kenya and Tanzania. More generally, it needs to develop regional markets on a broad scale.

Conclusions and Policy Implications

The study has investigated the effects of the opening of trade in maize with Malawi on producer and consumer maize prices in Mozambique.
Major findings of the empirical analysis are as follows. Trade with Malawi had large and statistically significant effects on producer prices in Ribaué, Angoche and Mocuba. Consumers in Maputo and Beira have suffered no adverse price effects

Three policy implications emerge from these findings.

First, an open trade regime is clearly in Mozambique's national interest. Policy makers should expect the north and the center should export maize regularly, and the south to import every year and should design policies and programs that reduce the cost of doing so. Three specific steps should be taken: 1) push for rapid liberalization of maize trade in the region under the SADC Trade Protocol, 2) provide timely and improved regional outlook information and regional policy monitoring, and 3) simplify and facilitate the export process.

A second policy implication is that Mozambique needs to look beyond Malawi in developing its market for maize; Zambia and Zimbabwe may provide demand for Mozambican maize in years when Malawi does not (as in 1999).

The final policy implication relates to efforts to intensify maize production in Mozambique. Studies to date make it clear that producer prices will be too low to sustain maize intensification in the absence of regional trade. By substantially increasing the probability of remunerative prices for northern Mozambican producers even during years of overall regional surplus, this trade creates the possibility of successful intensification. Efforts to deal with the institutional and technical challenges of intensification must be pursued in the context of developing these regional markets.

Endnotes

1. Inefficiencies in the ports and rails have substantially increased the cost of importing and exporting, but are being addressed through major investment and moves towards privatization of port management.

2. A Seemingly Unrelated Regression (SURE) approach was used in which the equations for each of the six markets were estimated jointly. Autocorrelated errors were corrected using lagged values of the dependent variables, based on the results of a Durbin-h test. See Tschirley and Santos (1999) for more detail on methods.

References

Bowen, Nina (1998). "Trade, Traders and Trading - Malawi and Zambezia Province, Mozambique". Annex 1 to Whiteside (1998).

Donovan, Cynthia (1996). "Effects of Monetized Food Aid on Local Maize Prices in Mozambique". Unpublished Ph.D. Dissertation. Michigan State University Department of Agricultural Economics. East Lansing, MI.

Haggblade, Steven, Peter Hazall and James Brown (1989). "Farm-nonfarm linkages in rural Sub-Saharan Africa". *World Development*, vol. 17 no. 8, pp. 1173-1201.

Macamo, Jose Luis (1998). "Estimates of unrecorded cross-border trade between Mozambique and her neighbors: implications for food security". Final report for TechnoServe, Inc. Nairobi, Kenya.

Tickner, Vincent (1997). "Rural trade in Mozambique: Pre-feasibility study central and northern provinces". Publications on Agriculture and Rural Development No. 5, Dept for Natural Resources and the Environment. SIDA, Stockholm.

Tschirley, David and Ana Paula Santos (1999). "The Effects of Maize Trade with Malawi on Price Levels in Mozambique: Implications for Trade and Development Policy". Under review for *Food Policy*.

Whiteside, Martin (1998). "When the Whole is More than the Sum of the Parts - the effects of cross-border interactions on livelihood security in southern Malawi and northern Mozambique". A Report for Oxfam GB.

The original version of the paper on which this *flash* is based was prepared for the Agricultural Transformation in Africa Workshop, June 27-30, 1999 Nairobi, Kenya , Sponsored by Tegemeo Institute / Egerton University, Njoro, Kenya, Eastern and Central Africa Programme for Agricultural Policy Analysis (Ecapapa), Entebbe, Uganda and Michigan State University, East Lansing, Michigan.