



Regional trade, government policy and food security: Recent evidence from Zambia

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ABSTRACT

Given heavy dependence on rainfed maize production, countries in East and Southern Africa must routinely cope with pronounced production and consumption volatility in their primary food staple. Typical policy responses include increased food aid flows, government commercial imports and stock releases, and tight controls on private sector trade. This paper examines recent evidence from Zambia, using a simple economic model to assess the likely impact of maize production shocks on the domestic maize price and on staple food consumption under alternative policy regimes. In addition to an array of public policy instruments, the analysis evaluates the impact of two key private sector responses in moderating food consumption volatility – private cross-border maize trade and consumer substitution of an alternate food staple (cassava) for maize. The analysis suggests that, given a favorable policy environment, private imports and increased cassava consumption together could fill roughly two-thirds of the maize consumption shortfall facing vulnerable households during drought years.

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Introduction

Maize, Africa's number one food staple, provides over half of all calories consumed in Zambia. Yet dependence on rainfed maize production leads to highly volatile output from 1 year to the next, in Zambia as in many parts of Sub-Saharan Africa (Fig. 1). Given erratic rainfall, and less than 5% of cropped land under irrigation, Zambia's maize crop fails to satisfy national market demand, on average, in 1 year out of 3. In years of poor harvests, when drought, reduced planting area, or input supply bottlenecks constrict output, Zambia has imported maize. In good harvest years, Zambia produces a maize surplus, enabling the country to export maize. Given this pronounced production volatility, trade becomes a valuable tool for stabilizing national food supplies and prices.

Yet, as in much of Africa, government mistrusts traders. Policy makers fear a loss of government control over maize supplies and the politically sensitive maize price. They fear that collusion by traders may lead to market manipulation and profiteering that could, in turn, lead to politically damaging food shortages and price spikes. As a result, in recent years, Zambia's default policy has been to restrict private sector cross-border maize flows. Following the deficit harvest of 2005, the Zambian government restricted maize imports. And following successive good harvests, in 2006 and 2007, the government tightly controlled exports.

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The mistrust is mutual. In part, traders have difficulty anticipating what government will actually do. During the first half of 2007, the Zambian government position on maize exports changed three times (Zinyama, 2007; Chalu, 2007; Times, 2007a; Malan, 2007; ZNFU, 2007). And in the all too common deficit years, private traders are reluctant to bring in commercial grain, which they would then be able to sell only at a loss if the government gives in to the political pressure to subsidize public sector maize imports. Zambian traders remember the risks they incurred under these conditions in both 2000/2001 and 2005/2006 (Nijhoff et al., 2003; Mwanauo et al., 2005). Uncertainty about government intentions, coupled with the fear of being undercut by subsidized public sales, induces private grain traders to remain on the sidelines or to limit their exposure by bringing in only small lots. In response, governments complain that they cannot rely on the private sector to import adequate quantities of food in times of need. Where private traders and African governments fail to solve staple food supply problem themselves, food aid donors stand ready to fill the gap.

In Zambia, as in much of southern Africa, three sets of actors, with three sets of tools, stand willing to help buffer maize shortfalls and surpluses. Private traders lobby actively for unrestrained cross-border trade as a means of moderating domestic surpluses and deficits. Governments, however, often prefer direct public import or export by parastatal food agencies such as Zambia's Food Reserve Agency or Malawi's National Food Reserve Agency. Food aid agencies, together with governments, estimate potential supply gaps that need to be filled by public or food aid imports. In

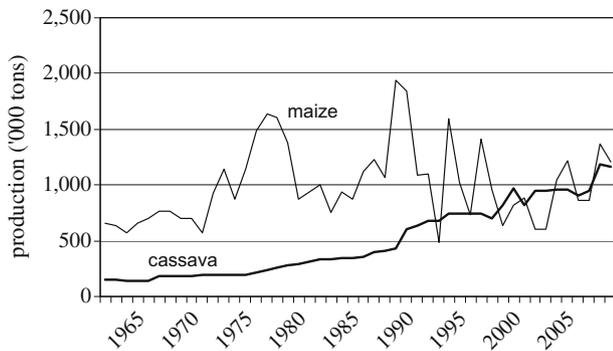


Fig. 1. Production trends in food staples in Zambia. Source: FAOSTAT and Zambia Ministry of Agriculture and Cooperatives.

surplus years, governments favor local procurement by public grain marketing agencies as a means of supporting farm prices. Simultaneously, some donors conduct local procurement for export to neighboring deficit countries or refugee camps. The food aid agencies likewise closely monitor within-country variations in food availability, prices and income and stand willing to provide targeted food or income support to vulnerable groups. All three groups – the private traders, governments and food aid agencies – respond in related ways to the pressures and opportunities created by intermittent maize supply shocks.

Where these three actors cooperate, their actions can prove complementary. However, where they misjudge or mistrust each other, one or another may over-react, potentially aggravating both price volatility and swings in food availability. During the drought of 2002/2003, for example, the Malawian government failed to anticipate the roughly 200,000 tons of private sector maize imports from northern Mozambique, attracted by high maize prices in drought-stricken Malawi. This miscalculation led to excessive public imports, subsequent sales to unload surplus public stocks, government financial losses, and depressed maize prices both during the lean season and early in the following harvest season (Tschirley et al., 2004; Whiteside, 2003). In addition to dampening incentives for Malawian farmers, this overshooting on public and food aid imports discouraged seasonal private sector storage and reduced incentives for Mozambican farmers to produce for the Malawian market in future years. Clearly, each set of actors needs to anticipate accurately the actions of the others.

This paper aims to help facilitate dialogue among these three groups by presenting a simple economic model developed to enable government, the private sector and food aid agencies quickly assess the likely impact of production shocks on domestic maize prices, incentives for private sector import, national food availability and consumption of vulnerable groups. The model aims to predict the potential responsiveness and impact of private trade as well as the likely consequences of food aid, public procurement and other common policy interventions. Section 2 of this paper sets the stage by describing the staple food economy of Zambia. Section 3 then presents the analytical framework used to examine the impact of year-to-year production fluctuations as well as the consequences of potential private and public sector responses. Sections 4 and 5 illustrate how public policy makers, food aid donors and the private sector can apply this framework to assess the effectiveness of various private and public responses during both a drought year (Section 4) and a bumper harvest year (Section 5). Section 5 likewise describes a specific application of the model where the authors used this model to estimate the likely impact of alternate export quotas during stakeholder discussions of Zambia's 2006 maize export controls. Section 6 presents a sensitivity analysis of

the results, while Section 7 concludes by summarizing key policy and operational implications.

The Zambian food economy

Production of staple foods

Maize, Zambia's principle food staple, accounts for 60% of national calorie consumption and serves as the dietary mainstay in central, southern and eastern Zambia. Because rainfed smallholder farms accounts for over two-thirds of national maize production, under erratic rainfall conditions, maize output has proven highly volatile over time (Fig. 1). Following the withdrawal of maize marketing and input subsidies, beginning in the early 1990s, maize production in Zambia trended gradually downward over the ensuing decade and a half, though amid wide weather-induced variation (Zulu et al., 2000). The abandonment of large-scale government procurement and pan-territorial pricing likewise reduced price incentives for maize cultivation, particularly in more remote areas. Consequently farmers reduced the area devoted to maize production and diversified into other food staples and export crops such as cotton, tobacco and paprika (Jayne et al., 2007). In 2006 and 2007, maize production recovered somewhat as a result of favorable rains, the resumption of fertilizer subsidies and large-scale government maize procurement through the newly reconstituted Food Reserve Agency (Fig. 1).

Cassava, the nation's second largest source of calories, accounts for roughly 15% of national calorie consumption. Production has grown rapidly since the early 1990s (Fig. 1), when government breeders released their first wave of highly productive new cassava varieties. Cassava serves as the principle staple in northern Zambia and is widely grown in western Zambia, where the Lozi people consume a diversified diet of rice, cassava, sorghum and maize. Production of sweet potatoes, though not well captured in national food balance sheets, has likewise grown rapidly over the past decade, following the release of several new cultivars by Zambia's Root and Tuber Improvement Programme. Sorghum and millet, widely grown minor crops, supplement diets in southern, western, northern and central Zambia. While Zambia's predominantly rainfed maize crop proves highly susceptible to drought, diversification into alternate staples such as cassava, sweet potatoes, sorghum and millet has moderated this volatility by expanding the country's portfolio of drought-resistant alternate foods.

Prices

Because of variability in rainfall and government maize policy, both maize production and prices have varied substantially, with the domestic wholesale price ranging between \$100 and \$350 per ton (Fig. 2). In drought years – such as 1992, 1995, 1998, 2001, 2002 and 2005 – as maize production has fallen, domestic price has risen sharply, up to and sometimes surpassing import parity, leading to strong incentives for private commercial maize imports during years of domestic production shortfall (Fig. 2). Zambia's maize imports come primarily from South Africa, though in some seasons the country has imported maize from southern Tanzania, northern Mozambique and even as far away as Uganda.

Domestic food policies

Zambia's governments have intervened heavily in maize markets since at least the 1930s. Before independence in 1964, maize pricing policies favored commercial white farmers, who received 75% of the Maize Control Board's internal purchasing quota and re-

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