

Effects of Marketing and Trade Policies on Maize Prices in Kenya



T.S. Jayne, R. Myers, and J. Nyoro

*Presented at IAAE Meetings,
Gold Coast, Australia
August 12-18, 2006*

Background

- Since colonial times, Kenya has set maize prices through marketing board operations
- National Cereals and Produce Board:
 - sets prices, buys and sells (25% of total supply)
 - holds buffer stocks
 - imports and exports
 -all under official liberalized marketing system

-
- NCPB purchase prices generally above market prices
 - Maize import tariff – zero to 30%
 - Nagging concerns over effects on growth and poverty

Objectives

1. Estimate the effects of historical NCPB marketing policies on regional maize market prices in Kenya.
2. Estimate the effects of historical maize import tariffs on regional maize market prices in Kenya.

The Approach

- A natural approach would have been a SEM of supply and demand for maize by region.
- However, data limitations precluded this approach. The only viable alternatives are:
 1. Simulation.
 2. Structural VAR.

Structural VAR

- Estimate a reduced form dynamic model of regional maize market prices, including policy variables.
- Then re-run the model with historical market shocks but setting all policy variables to zero (i.e. extract the policy effects to estimate a set of counterfactual prices).
- Results are highly dependent on identification assumptions.

Methodology

Suppose a vector of market variables y , and vector of policy vectors, p , are related according to the reduced form VAR model:

$$By_t = \sum_{i=1}^k B_i y_{t-i} + \sum_{i=0}^k C_i p_{t-i} + A^y u_t^y$$

$$Dp_t = \sum_{i=0}^k G_i y_{t-i} + \sum_{i=1}^k D_i p_{t-i} + A^p u_t^p$$

Methodology (cont.)

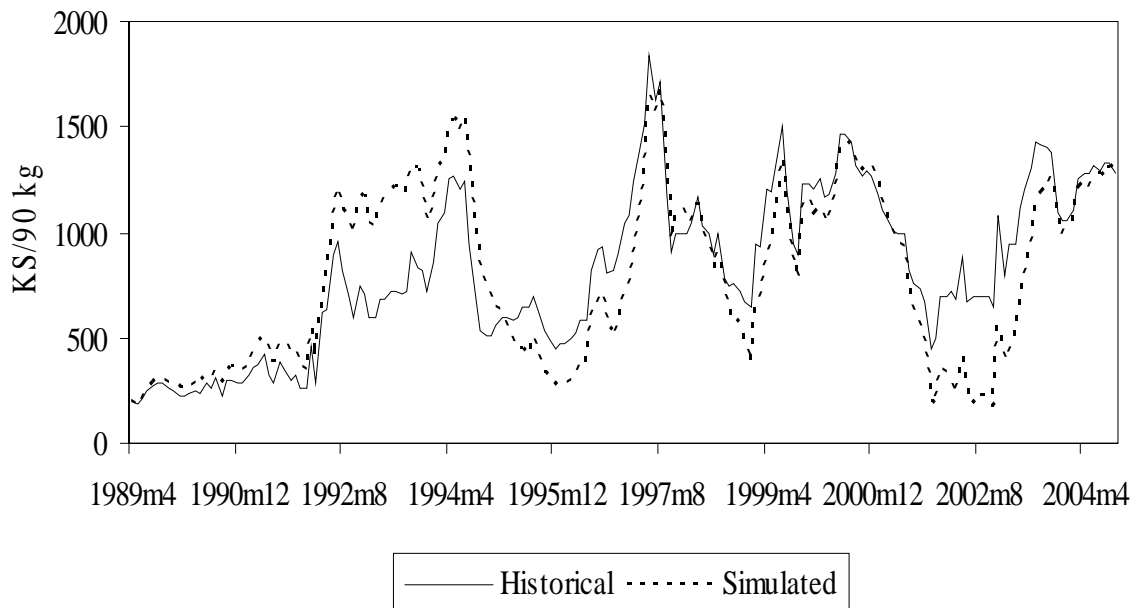
This specification is very general because:

1. The dynamic relationships are relatively unrestricted.
2. The contemporaneous influences among market and policy variables are also left unrestricted.

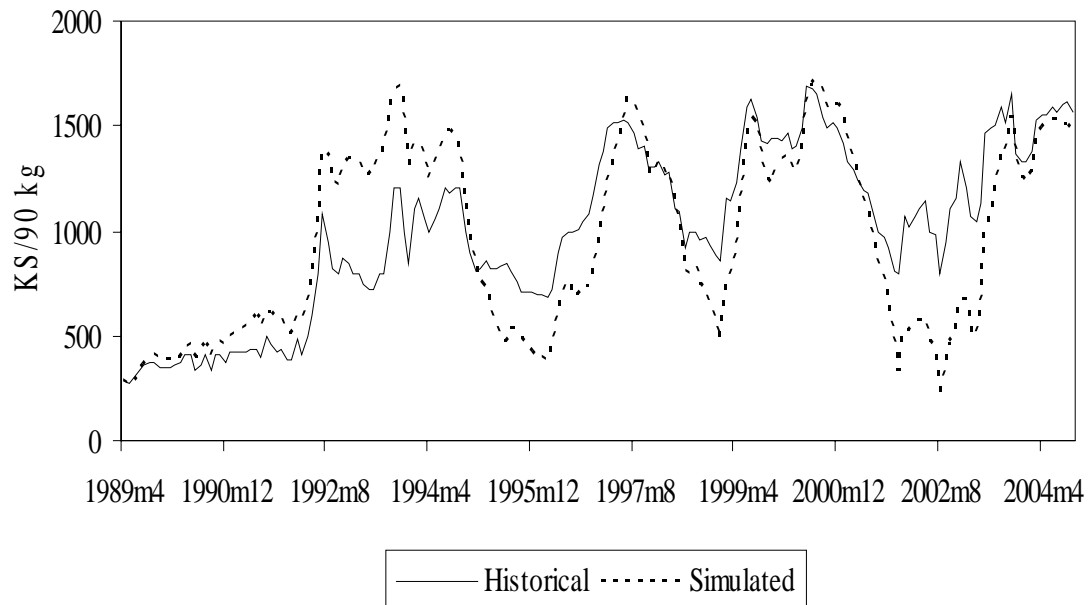
Data

- Data are monthly from January 1989-October 2004.
- Market variables:
 - Uganda wholesale maize price
 - Kitale wholesale maize price
 - Nairobi wholesale maize price
- Policy Variables (in recursive order):
 - NCPB buy price premium (NCPB buy price – Kitale price)
 - NCPB sell price premium (NCPB sell price – Nairobi price)

Historical and Simulated (No NCPB) Kitale Prices



Historical and Simulated (No NCPB) Nairobi Prices



Period	Kitale wholesale maize price (Ksh per 90kg bag)			Nairobi wholesale maize price (Ksh per 90kg bag)		
	Historical	Simulated	% difference	Historical	Simulated	% difference
<i>April 1989 – May 1992</i>	305.63	367.28	-16.8%	395.37	474.50	-16.7%
Mean	96.29	127.43	-24.4%	62.17	113.35	-45.2%
Standard deviation	31.5%	34.7%	-9.2%	15.7%	23.9%	-34.2%
Coefficient of variation						
<i>June 1992 – June 1995</i>	780.30	1064.38	-26.7%	942.00	1236.33	-23.8%
Mean	217.20	304.88	-28.8%	159.93	295.31	-45.8%
Standard deviation	27.8%	28.6%	-2.8%	17.0%	23.9%	-28.9%
Coefficient of variation						
<i>July 1995 – October 2004</i>	1006.65	831.47	21.1%	1225.72	1019.25	20.3%
Mean	308.07	395.64	-22.1%	281.01	425.44	-33.9%
Standard deviation	30.6%	47.6%	-35.7%	22.9%	41.7%	-45.1%
Coefficient of variation						
<i>Overall sample period (April 1989 – October 2004)</i>	819.41	783.23	4.6%	1000.85	951.50	5.2%
Mean	378.10	408.79	-7.5%	398.60	439.13	-9.2%
Standard deviation	46.1%	52.2%	-11.6%	39.8%	46.2%	-13.7%
Coefficient of variation						

Summary of Import Tariff Effects: 1995-2004

- On price levels:
 - +2.0% (Nairobi)
 - +2.9% (Kitale)
 - In some years, raised local prices by up to 9%
- On price volatility:
 - Tariff had little impact on price stability

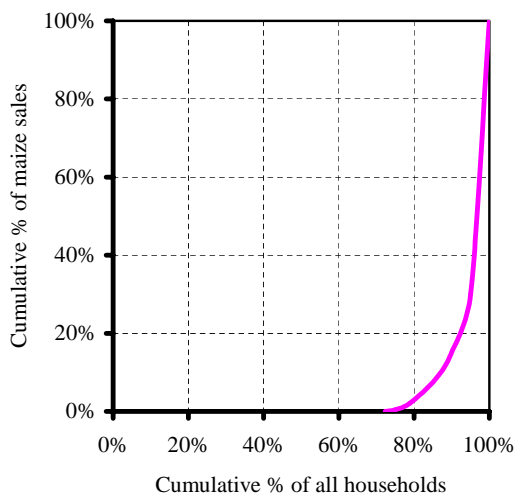
Why Has Import Tariff Generally Had Only Minor Impact on Prices?

- Porous borders → smuggling
- Informal arrangements between traders and border police

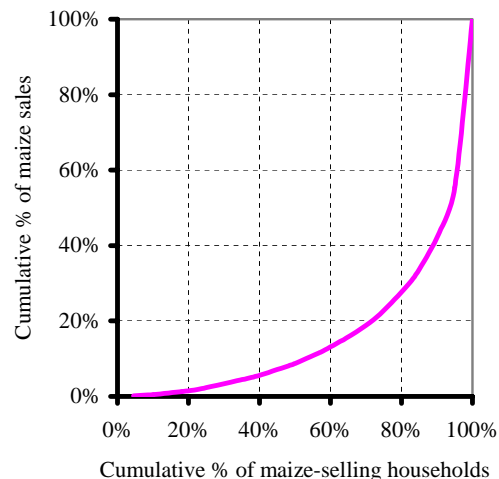
Who benefits and who loses from NCPB operations?

- Depends firstly on:
 - Who sells maize (and how much)
 - Who buys maize
- Depends secondly on how changes in maize production affect employment and wages

Concentration of maize sales; smallholder sector, Kenya, 2000



a) Among all smallholdings



b) Among maize sellers

Most rural farm households are buyers of maize

Kenya (2000, 2004)

- Eastern Province: 79%
- Coast: 93%
- Nyanza Province: 68%
- Central Province: 71%
- Western Highlands: 57%
- North Rift: 22%

Effects on Income Distribution

- Beneficiaries:
 - Large-scale farmers in N. Rift
 - Small farmers in areas such as Trans Zoia, Uasin Gishu, Lugari
- Losers:
 - Urban consumers
 - Maize purchasing rural households
- NCPB's promotion of maize price stability has had important indirect benefits to the economy

Conclusions:

- NCPB operations have
 - generally raised maize market prices by 15-18%
 - Stabilized prices
- Import tariff has not had major effect
- NCPB operations shift income from maize consumers (small farmers, urban consumers) to large maize sellers

Conclusions (cont.)

- Reduced form time series analysis can provide useful estimates of quantitative policy effects in sparse data environments (such as often are found in developing countries).

