Impacts of Tanzania Maize Export Bans on Production and Assets Accumulation

Wilfred Makombe and Jaclyn D. Kropp

SCC-76, Pensacola, Florida

March 2016

Introduction

- Tanzania is largest maize producer in the region
- About 65% of households grow maize
- Semi-commercial households -- Small farms producing for both household consumption and sale
- Maize is the main staple food

Export bans policy

- Periodic bans since 1980's
  - July 2003 - October 2011 imposed bans for approximately 72 months
- Goals:
  - Ensure domestic food supply
  - Protect domestic consumers from high world prices
- Implementation:
  - Direct government notice restricting exportation
  - Withdrawing existing export permits
  - Deny issuance of new export permits

Export bans policy

- Reduces incentive to produce
- Export bans lower producer prices by 7-26% hence lowering farm profitability. (Porteus, 2012; Dabalen and Paul, 2014).
- How do the bans impact production, asset accumulation, and food security?
  - Produce other crops or leave agriculture?

Literature review

- 2007-2008 rapid increase in world prices
- India, Russia, Ukraine, Vietnam and Sub-Saharan African countries imposed export restrictions on staple foods
  - Smooth domestic food supply
  - Lower domestic consumer prices
- Forms of protections:
  - Export taxes, export quota, and export bans

Literature review

- Diao et al. (2013)
  - Tanzania
  - Computable General Equilibrium (CGE)
  - Decrease in producer prices by 7-26%
- Mitra and Josling (2009)
  - India
  - Simulation for 2008
  - Decline in producer prices and rise in consumer prices
  - Welfare loss to both producers and consumers

Literature review

- Kompas at el. (2010)
  - 2006 Vietnamese Living Standard Survey (VHSS) data
  - Examined rice export ban using CGE model
  - Limited benefits to poor rural households
- Goetz et al. (2010)
  - 2007/2008 Russia and Ukraine wheat export restrictions
  - Markov–Switching vector error correlation model
  - Lower producer prices

Literature review

- Wellton (2011):
  - 2007/2008 Russia and Ukraine wheat export restrictions
  - Consumer prices did not decrease due to speculators hording
- Chapoto and Jayne (2009):
  - ARCH models
  - Examined amplitude of price instability resulting from government intervention in maize markets in Sub-Saharan countries
  - Export barriers lead to high price volatility and uncertainty

Literature review

- Ngaruko, Bushesha, and Pallangyo (2014):
  - Rice market
  - Tanzanian household survey data
  - Export bans scare away investments in food subsector
- Anania (2013):
  - Food security can be improved by stabilizing domestic prices of staples important in the diet of the poor

Literature review

- Export bans may lead to sluggish agricultural growth, price and market uncertainty, black markets and welfare loss to both farmers and consumers.
- In some countries like Russia, Ukraine and Vietnam the export bans were uplifted after a short time .

Motivation and objectives

- Few studies have examined the impact of export bans using household survey data
  - Analyze the impact of export bans policy on production, time use, and asset accumulation
  - Determine maize producers' response to periodic maize export bans
  - Examine the farmers response to price uncertainty

Theoretical model

- Tanzania farmers are both production and consumption units
- Household production model (Becker 1965)
- Modification to allow the households to sell the surplus agricultural products (Barnum and Squire 1978)
- Introduce price and policy uncertainty

Theoretical model

- Assumptions:
  - Household maximizes both utility and profit
  - Household maximizes utility by consuming own produced commodities, market commodities and leisure
  - Land is fixed in short-run, households can reallocate the land in various crops to mitigate risks
  - Multiple crops are produced to allow farmer to mitigate risks (price and policy)
  - Maximizes utility subject to production functions, time constraints, expected prices, and budget constraint

Theoretical model

- $Max\ E(U) = E[U(C, M, L;\ a_i)]$,

  $s.t.\ F = F(Z; D, X, A)$,

  $T = H + L + D$, and

  $qM + pC = wH + R + \sum p_j Z_j - \sum r_{jk} X_{jk}$

Methods

- Cross-sectional survey data collected from 250 maize producing households
- Mufindi district - Important maize production zone
- 10 villages
- 25 randomly selected farming households from each village
- 244 usable observations
- US$1= 2190 TZ Shilling

Summary Statistics by Village

Village	Income	Assets	Maize Price	Total Acreage	Percentage of Total Income from Maize	Percentage of Total Acreage in Maize
Bumilayinga	6,425,643	14,000,000	37,333.32	4.32	0.16	0.66
Ikimilinzowo	4,923,419	13,800,000	36,347.82	5.77	0.16	0.69
Ikongosi	3,040,980	12,300,000	37,738.10	3.96	0.10	0.51
Isalavanu	8,647,333	18,300,000	39,294.12	6.29	0.18	0.68
Itimbo	4,189,524	14,400,000	36,666.68	3.86	0.08	0.61
Lugoda	4,914,926	10,400,000	42,952.93	5.70	0.18	0.72
Mwilavila	4,662,250	12,600,000	36,052.63	3.23	0.17	0.72
Mwitkilwa	6,189,852	32,200,000	40,285.71	4.99	0.13	0.51
Nundwe	8,022,478	42,500,000	41,166.67	4.80	0.10	0.55
Ukemele	1,987,667	6,266,479	38,333.33	3.08	0.13	0.71
All Villages	5,205,311	17,500,000	38,627.17	4.63	0.14	0.64

Summary Statistics by Village

Village	Age	Male	Household Size	Number of Laborers in HH	Percentage of Total HH Labor Time Spent in Ag
Bumilayinga	38.30	0.57	4.43	2.96	0.55
Ikimilinzowo	40.58	0.84	5.23	3.52	0.51
Ikongosi	41.96	0.64	5.44	4.24	0.49
Isalavanu	40.21	0.63	4.37	3.11	0.51
Itimbo	42.43	0.24	5.29	3.90	0.49
Lugoda	41.70	0.48	5.04	3.78	0.49
Mwilavila	48.29	0.50	6.08	4.67	0.48
Mwitkilwa	47.48	0.74	5.48	4.74	0.44
Nundwe	43.87	0.61	5.52	4.30	0.48
Ukemele	42.25	0.50	5.75	4.38	0.48
All Villages	*42.76*	*0.59*	*5.28*	*3.98*	*0.49*

Summary Statistics by Village

Village	Maize	Sunflowers	Beans	Potatoes	Tomatoes	Peas	Wheat	Millets
Bumilayinga	2.37	0.83	0.63	5.11	0.50	.	0.50	.
Ikimilinzowo	3.77	1.17	2.06	.	1.44	.	.	.
Ikongosi	2.11	.	1.29	1.25	0.25	.	1.00	.
Isalavanu	2.91	1.00	1.78	4.58	2.15	.	.	.
Itimbo	2.02	.	0.88	1.90	0.25	.	1.00	.
Lugoda	3.13	1.07	1.20	13.75	4.50	.	.	.
Mwilavila	2.21	1.07	1.06	.	1.00	.	.	.
Mwitkilwa	2.65	.	1.29	1.11	.	0.50	1.42	0.92
Nundwe	2.53	.	1.12	1.91	.	1.00	1.00	.
Ukemele	2.27	1.29	1.21	1.00	0.50	0.50	.	.
Total	*2.64*	*1.11*	*1.33*	*2.33*	*1.94*	*0.67*	*1.09*	*0.92*

Summary Statistics

- Reasons for growing maize:
  - 56% -- Own consumption
  - 19% -- Primary source of income
  - 18% -- Additional source of income
  - 7% -- Inherited
- About 65% of farmers are not satisfied with income generated from maize sales
- About 68% of respondents were affected by the export bans, while 32% were not affected because they produced only for consumption

Summary Statistics

	Income groups			
	<2m TSh.	2 to 4m TSh.	>4m TSh.	Total
Not affected	13.6	2.63	2.19	18.42
Neutral	8.33	2.19	3.07	13.60
Affected	23.25	17.54	27.19	67.98
Total	45.18	22.37	32.46	100

Summary Statistics

Of those affected:

- 29% suffered a loss
- 21% reported lower profits due to low price
- 21% were not able to buy the inputs for the next season
- 10% were not able to sell all their maize due too few buyers

Summary Statistics

- Of those affected:
  - 20% reduced maize production
  - 34% now produced for household consumption only
  - 19% stored maize to wait for the government to lift ban
  - 23% shifted to production of other crops (beans, potatoes, sunflower and tomatoes) as source of income

Summary Statistics

- How do you compare your own well - being with the time before you started growing maize?
  - 11% Worse-off
  - 30% Neutral
  - 59% Better-off
- How do you compare your own well-being with household not growing maize?
  - 30% Worse-off
  - 23% Neutral
  - 47% Better-off

Summary Statistics

Extent Affected	Would not advise	Would Advise	Total
Not Affected	10.96	7.46	18.42
Neutral	8.77	4.82	13.6
Affected	42.11	25.88	67.98
Total	61.84	38.16	100

Summary Statistics

	Increase Maize Acreage Next Season		
Extent Affected	No	Yes	Total
Not Affected	9.21	9.21	18.42
Neutral	5.70	7.89	13.60
Affected	41.67	26.32	67.98
Total	56.58	43.58	100

Summary Statistics

	Price Expectation				
Increase Maize Acreage Next Season	Don't Know	Unchanged	Decrease	Increase	Total
No	15.57	4.92	4.1	32.79	57.38
Yes	7.38	3.28	1.64	30.33	42.62
Total	22.95	8.2	5.74	63.11	100

Percentage of Total Acreage in Maize

	Coefficient	P>t
Age	0.0024025	0.075
Primary School	-0.0231984	0.695
Secondary School and Above	0.0361444	0.625
Male	**-0.0878844****	**0.004**
Household Size	**0.0328335****	**0.006**
Number of Laborers	**-0.0313624***	**0.024**
Extent Affected = Neutral	0.0380442	0.419
Extend Affected = Affected	-0.0485401	0.197
Price of Maize	0.0000209	0.232
Price of Beans	0.00000732	0.466
Price of Sunflowers	-0.0000119	0.36
Price of Potatoes	-0.00000436	0.319
Price of Tomatoes	**-0.0000141***	**0.025**
Price of Wheat	-0.00000855	0.201
Income	**-0.00000000443****	**0.008**
Assets	**0.00000000215****	**0.002**
Growing Maize for Income	0.0343398	0.28

Motivation for Growing Maize (1=income, 0=own consumption)

	dy/dx	P>z
Age	-0.0005286	0.851
Primary School	-0.0731229	0.549
Secondary School and Above	-0.1424593	0.363
Male	0.0722871	0.216
Household Size	0.0076306	0.63
Dependents	-0.0350475	0.184
Total Acreage	-0.0451474**	0.002
Assets	-0.00000000438***	0.001
Income	-0.0000000134*	0.047
Extent Affected = Neutral	0.011251	0.896
Extent Affected = Affected	**-0.2294352****	**0.002**
Price of Maize	**0.0000215*****	**0.001**

Increase Maize Acreage Next Season

	dy/dx	P>z
Age	-0.0074007*	0.011
Primary School	-0.3464458*	0.015
Secondary School and Above	-0.1667436	0.355
Male	**0.144744***	**0.032**
Household Size	-0.0059801	0.721
Extent Affected = Neutral	0.1073357	0.334
Extent Affected = Affected	-0.0038985	0.966
Income Satisfaction = Neutral	0.1398003	0.097
Income Satisfaction = Satisfied	0.0821018	0.396
Assets	1.36E-09	0.375
Income	-0.00000000989	0.051
Growing Maize for Income	0.0951456	0.191
Expects Maize Price to Increase	**0.1429312***	**0.028**

Advice to Children

	dy/dx	P>z
Age	0.0015652	0.567
Primary School	0.1397556	0.192
Secondary School and Above	0.2032874	0.164
Male	**0.1242276***	**0.046**
Household Size	**-0.0772154*****	**0.000**
Extent Affected = Neutral	-0.0243875	0.804
Extent Affected = Affected	0.0291655	0.728
Wellbeing = No Change	0.1198757	0.200
Wellbeing = Improved	**0.2631378****	**0.003**
Expects Price to Increase	**0.1582545***	**0.013**
Growing Maize for Income	-0.0407527	0.574
Assets	**-0.00000000435***	**0.036**
Income	-1.52E-09	0.789
Price of Maize	0.0000352	0.373
Price of Beans	0.0000115	0.62
Price of Sunflowers	**-0.0000593***	**0.026**
Price of Potatoes	**-0.0000186***	**0.039**
Price of Tomatoes	0.0000128	0.474
Price of Peas	**-0.0000203***	**0.049**
Price of Wheat	-0.0000226	0.106

Conclusions

- Maize export bans hurt farmers' prices and profitability.
- Bans discourage farmers from producing maize for income generation.
- Although farmers are affected by the policy and are not satisfied with income from maize sales, they will not stop maize production.Instead they reduce production to household consumption level.

Conclusions

- Farmers are shifting to crops with higher returns like tomatoes, potatoes, peas and sunflower.
- Reduction of maize production has implication for food supply and security since maize is the country's staple food

Future Research

- Analyze change in production patterns overtime
  - Recall problems: Many respondents could not remember what they produced
- Analyze asset values overtime
- Analyze time allocated to agriculture