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**Public Stockholding in a Liberalized Grain Trade:
Recent Country Experiences and Emerging Evidences**

Mulat Demeke, Areej Jafari, Eugenia Steanelli, and Stefania Croce

*Selected Paper prepared for presentation at the International Agricultural Trade Research Consortium's (IATRC's) 2014 Annual Meeting:
Food, Resources and Conflict, December 7-9, 2014, San Diego, CA.*

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Recent Country Experiences and Emerging Evidences

M. Demeke, A. Jafari, N. Tefera, E. Stefanelli, and S. Croce

2014 IATRC Annual Meeting
"Food, Resources and Conflict"
December 7-9, 2014
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Outline

- I. Background
- II. Socio-economic and political considerations
- III. Factors influencing public stock decisions
- IV. Conclusions

I. Background

- Different types of stocks – public vs. private
- Public stocks
 - Buffer stocks
 - Emergency reserve
 - Safety net stocks
 - Security stocks
 - Strategic reserve
- Two contrasting trends
 - Declining importance in d/ed countries
 - Renewed interest in d/ing countries, despite reforms
 - High fiscal costs
 - Crowding out private stocks

I. Background ...

- Objectives of the study
 - Examine the different aims of grain stocks, taking into account the various objectives and the drive to liberalize markets and trade
 - Explore the motivations for establishing public stocks
 - Identify factors influencing decisions to invest in stocks

II. Socio-economic and political considerations

- In theory, markets create incentives for the private sector to store grain
 - Adequate to meet current and future consumption needs
- However, several concerns why governments find reliance on private storage alone is not enough
 - Public stocks needed to
 - Address price variability,
 - Respond to food security needs
 - Accommodate political concerns
 - Overcome cost of imports

II. Socio-economic and political considerations ...

1. As an instrument for addressing price volatility
 - Nominal prices of ag commodities more volatile
 - Disruptions in production – extreme weather
 - Inelastic supply and demand
 - Market failures
 - Underdeveloped infrastructure and institutions
 - Volatile and unpredictable prices reduce investment
 - Hence, buffer stocks to stabilize prices
 - Release or procure grain to stabilize prices
 - Several countries use buffer stocks
 - Evidence is mixed – some mention Kenya and Zambia as a success but others do not agree
 - Some have failed completely – Malawi and Sudan – poor governance
 - Nonetheless, many African governments continue to support stockholding

II. Socio-economic and political considerations ...

2. As a response to food security concerns

- Two main reasons for food security concerns
 - Region highly vulnerable to food insecurity
 - 39 of the 59 most at risk of food insecurity are African countries
 - A high proportion of income is spent on food in Africa
 - Estimated at 42%
- Stockholding a preferred option
 - The Ethiopian Emergency Food Security Reserve Admin. – successful
 - **Small quantity** (180,000 MT)
 - Food aid targeted – not displacing markets
- Challenges if agencies undertake additional tasks
 - Zambia's Food Reserve Agency – support producers and also urban consumers
- But both can be done if managed well
 - Brazil and WFP use stocks to link support to small producers with safety net programs

II. Socio-economic and political considerations ...

3. As a response to political concerns

- Political considerations important in establishing public stocks
 - Gain the support of the powerful urban populace
 - Food riots a common problem – 14 countries across Africa in 2007/08
 - » Release of public stock a major policy response
 - Burkina Faso in Feb 2008
 - Food security concerns due to national security fears
 - Threat that navigation waters may be blocked
 - Exporting countries may impose export ban – major concern for heavily import dependent countries
- Mineral or oil rich countries may prefer large reserves as part of their national security strategy

II. Socio-economic and political considerations ...



4. As an option to high cost of food imports

- Food imports can be costly
 - Divert foreign exchange and create shortage of foreign exchange
 - Imported food staples more expensive than locally produced staples
 - imports involve expensive access costs
 - » Maritime transport, port transfers, customs clearance and inspection, etc.
 - Add 30 to 100 % onto the price of imported food in LAC – more in Africa
 - » Maize prices in Africa are relatively cheaper than rice or wheat
- Landlocked countries face higher average costs
 - 15 countries are landlocked in Africa
 - landlocked countries pay 50 % more in transport costs than coastal countries
 - Inland transport costs can be prohibitive for landlocked countries
 - Numerous checkpoints
 - » E.g. 32 checkpoints along the corridor Abidjan-Bamako road
- Some countries have plans to expand their stock levels
 - Ethiopia – 1.5 million tons
 - Malawi also almost to double its reserve
 - Both landlocked countries

III. Factors influencing public stock decisions

1. Methodology

- Binary choice of either participation or non-participation in public stock
 - Both logit and probit models can be fitted but both ignore the stock level decision
 - Levels of stock important for effective management
- DH model estimated by the following log-likelihood function :

$$\begin{aligned}
 LL = \sum_0 \ln \left[1 - \Phi(x'_{1i}\gamma) \Phi \left(\frac{x'_{2i}\beta}{\sigma} \right) \right] \\
 + \sum_1 \ln \left[\Phi(x'_{1i}\gamma) + \frac{1}{\sigma} \varphi \left(\frac{R_i - x'_{2i}\beta}{\sigma} \right) \right] \quad (1)
 \end{aligned}$$

Where:

- LL is log-likelihood function, R_i is national reserves for country i , $\Phi(\cdot)$ and $\varphi(\cdot)$ are the standard normal distribution and density functions (*cdf* and *pdf*), respectively, x_{1i} and x_{2i} are vectors of explanatory variables that affects the two-stage decisions
- Two hurdles: participation and level of expenditure

III. Factors influencing public stock decisions

2. Variables and descriptive results

- Public stocks
 - 27 African countries covered, 18 countries (67percent) had public stock.
 - Average ending stock varied widely across Africa from 117 kg per capita to less than 1 kg. The average is 35.5 kg per capita
- Production variability
 - The mean of production CV is 22 % (2006 – 13), (Lesotho 47%
- Cereal import dependence
 - Huge variation, from 85 % in Liberia and Lesotho to 6 % in Mali and Malawi.
 - Average 33.9 %
- Share of food expenditure in hh income
 - Average 51.6%, varying from 72 percent (Rwanda) to 19.2 percent (South Africa)
- Urban population growth rate: average 3.5%
- Landlocked countries: 37 percent of the countries covered
- Food subsidies: almost 63 % of the countries
- Export restrictions: Half of the countries (56 %) have applied the measure (2007 – 12)
- GDP per capita: average US\$ 1578.4, varying from US\$ 7314 in South Africa to US\$ 267 in Malawi

III. Factors influencing public stock decisions

Variables and descriptive results

- **Public stocks by access to ports**

AFRICA	Public stock		Total
	YES	NO	
Landlocked	80% (8 countries)	20% (2)	100% (10)
Not land-locked	58.8% (10)	41.2% (7)	100% (17)
All regions	Public stock		Total
	YES	NO	
Landlocked	84.2% (16)	15.8% (3)	100% (19)
Not land-locked	62.7% (32)	37.3% (29)	100% (51)

III. Factors influencing public stock decisions

3. Results

- Tables 2 and 3 present results from the two-stage process (Double-Hurdle) model using data from:
 - A smaller group of 27 African countries
 - A larger group of 70 African, Asian and LAC countries, respectively
- The findings reveal that a few factors influence:
 - The probability of policy decision to have public stocks, and Levels of stock

III. Factors influencing public stock decisions

Results

Table (2): DH model of factor influencing stockholding: Africa countries

	DH1 Probit reg. of holding stocks	DH2 Level of stockholding	DH1 Probit reg. of holding stocks	DH2 Level of stockholding
Foodsubsidy	1.669** (2.50)		1.783*** (2.59)	
Cimpotdep	-0.026 (1.44)	0.014 (1.11)	-0.031* (1.74)	0.009 (0.97)
Prodcv	2.580 (0.60)	-1.088 (0.49)	1.785 (0.55)	3.010* (1.73)
Urpogrowth	0.011 (0.03)	-0.473*** (2.67)	0.071 (0.23)	-0.393** (2.48)
Landlocked	-0.108 (0.11)	0.963* (1.67)		
Exportrestr			-0.641 (0.83)	0.905** (2.21)
Constant	-0.332 (0.19)	4.567*** (5.54)	0.098 (0.06)	3.393*** (3.64)
Sigma	0.590*** (5.83)		0.561*** (5.83)	
Wald Chi2	7.64		8.02	

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Robust standard errors in brackets

III. Factors influencing public stock decisions

Results

Table (3): DH model of factor influencing stockholding: All countries

	DH1 Probit reg. of holding stocks	DH2 Level of stockholding	DH1 Probit reg. of holding stocks	DH2 Level of stockholding
Foodsubsidy	1.157*** (3.06)		1.087*** (2.95)	
Lngdppc	4.932** (2.16)	1.387 (1.12)	4.678** (2.09)	0.709 (0.60)
Lngdppc2	-0.297** (2.07)	-0.070 (0.90)	-0.286** (2.03)	-0.030 (0.40)
Cimpotdep	-0.006 (0.86)	-0.003 (0.74)	-0.008 (1.17)	-0.005 (1.28)
Landlocked	0.519 (1.10)	0.387 (1.54)		
Constant	-19.792** (2.20)	-2.746 (0.55)	-18.271** (2.09)	0.254 (0.05)
Sigma	0.671*** (10.20)		0.686*** (10.20)	
Wald Chi2	12.86		12.17	

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Robust standard errors in brackets

IV. Conclusions

- Renewed interest in stocks because of:
 - Recent increases in price levels and volatility
 - A growing trend to install ‘safety nets’
 - Increasing emergencies due to extreme weather events;
 - Reducing dependence on high cost of imported staples;
 - Ensuring the right to adequate food and making social protection and food security ‘rights-based’ rather than ‘discretionary’
- Attempts to model the factors influencing public stocks have provided additional insights.
 - Cereal import dependence negatively associated with probability of policy decision to have public stocks
 - Production variability not related to probability of having strategic reserve but is significantly correlated with levels of public stock.

IV. Conclusions ...

- The presence of a food subsidy program by far the most significant factor associated with public stocks
 - Food subsidies politically more acceptable than many other social protection programmes
 - Food subsidies are important tools to gain political support.
- A quadratic relationship between GDP per capita and probability of holding stocks
 - At lower per capita level, interest in public stock increases with GDP per capita but the relationship reverses at relatively higher levels.
- In short, a combination of socio-economic and political considerations drive government decisions regarding public stocks
 - Stocks also attracting global attention: the 9th WTO Ministerial conference in Bali.

Thank you