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DETERMINANTS OF RICE MARKETED SURPLUS IN TOGO: A HECKMAN TWO-STAGE SELECTION APPROACH

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INTRODUCTION

- Rice consumption in Togo ranks 3rd after maize and sorghum and it accounts for 3% of the total GDP
- Rice production in Togo has increased from 72,860 tons in 2005, to 85,540 tons in 2008—a growth of 17.40%
- Rice consumption has been rising faster and the shortfalls have been met by imports costing 7.5 millions dollars per year (2008)
- Efforts to increase agricultural production have proved unsuccessful without an efficient marketing system

DEFINITION OF MARKETED SURPLUS

Marketed surplus is the surplus remaining after farmer has met the requirements of his family consumption, payment of wages in kind, feed and seed.

IMPORTANCE OF MARKETED SUPPLUS

Provides farmers with cash

Induces higher rural saving and investment → Economic development

Reduction of imports → sovereignty and food security for growing population

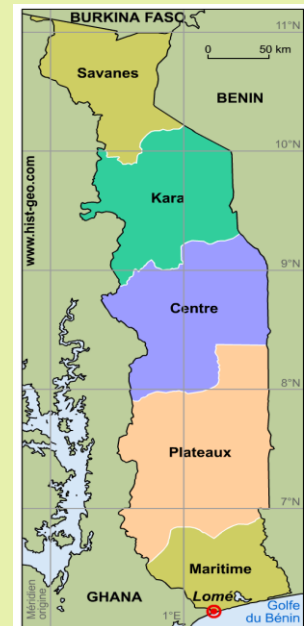
RESEARCH OBJECTIVE

Examine major determinants of rice marketed surplus in Togo with a particular emphasis on the effect of transaction costs

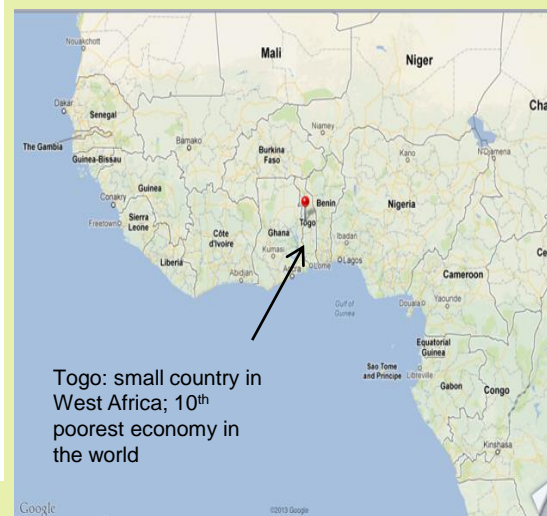
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METHODOLOGY

Data The data used were collected during the Consumer Preferences Survey (2010) conducted in Togo by the AfricaRice Center.



253 rice producer households were randomly selected from the 5 main regions of Togo: *Maritimes, Plateaux, Centrale, Kara and Savanes.*



Estimation method: HECKMAN 2 STAGE SELECTION MODEL

Stage 1:

→ Probit estimation of determinants of market participation (yes/no)

→ Get the Inverse Mill Ratio (IMR)

$$\text{Prob}(Y=1) = f(Z'\beta) + \varepsilon$$

Y: dependant variable (market participation)

Z: vector of explanatory variables including the intercept

β : vector of regression coefficients that depicts the relationship between the dependant and explanatory variables

ε : unobserved error term assumed to be independently and identically distributed following $N(0, \sigma^2)$

Stage 2:

→ OLS estimation of marketed surplus (Quantity sold by farmer given market participation);

→ Include IMR as independent variable to control for selectivity bias

$$Y = Z'\beta + \text{IMR} \cdot \theta + \varepsilon$$

Y: dependant variable (marketed surplus)

Z: vector of explanatory variables including the intercept

β : vector of regression coefficients that depicts the relationship between the dependant and explanatory variables

ε : error term

RESULTS AND IMPLICATIONS

Description	MARKET PARTICIPATION		MARKETED SURPLUS	
	Coefficient	Standard Error	Coefficient	Standard Error
Household characteristics				
Schooling (yes=1 No=0)	- 0.90**	0.43	0.09	0.50
Gender (Male=1 Female=0)	0.56	0.59	0.35	0.63
Age (years)	- 0.04***	0.02	- 0.02	0.02
Size of the family	0.13**	0.07	0.22***	0.07
Share of rice in household total income (%)	0.01	0.01	0.002	0.01
Market related characteristics				
Paddy Production (tones)	0.04	0.04	0.79***	0.03
Is the producer a farmer-trader? (yes=1 No=0)	0.28	0.57	0.43	0.45
Price of paddy in the prefecture in 2009 (FCFA)	0.10*	0.05	0.03	0.03
Social network				
Membership to a farmer association? (yes=1 No=0)	- 0.57	0.39	- 0.63	0.54
Location effects				
Savanes (yes=1 No=0)	0.38	0.58	- 0.34	0.77
Kara (yes=1 No=0)	1.67**	0.68	0.19	0.98
Plateaux (yes=1 No=0)	-2.81	316.51		
Maritimes (yes=1 No=0)	0.52	1.05	0.84	1.01
Inverse Mill Ratio (IMR)				
Constant	- 14.32*	7.93	- 6.82	4.75

- 76% market participation rate and 2 tons marketed surplus on average
- Higher market participation rate in Maritimes and Kara regions, which benefited the most from previous government interventions
- Positive output effect was observed, which supports policy interventions directed towards increasing rice production
- Considerable imperfections in Togolese rice market chain
- Presence of transaction costs → Price signals are not well transmitted to the farmers
- Government of Togo and development agencies should supplement improvements in rice production by addressing those market imperfections
- More investigation is needed to understand better the precise sources of market imperfections

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