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Cattle Markets Integration and Price Discovery in Three Developing Countries of Mali, Kenya, and Tanzania

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INTRODUCTION

One of the growing agricultural sub-sectors, in developing countries (DC), is **livestock**. Livestock accounts for a third of the total agricultural GDP in DC (2007). However markets in DC are less efficient compared to those in developed world (OECD), leading to economy underperformance. Market reforms policies have been introduced in many DC, especially in Africa either by their governments or international organizations such as WB and IMF since the 1980s. The goal of these reforms were to create a transparent and free market economy. In the last decade similar programs funded by USAID have been introduced in some African countries to create transparent markets in the livestock sector. Cases of livestock market information systems in Mali, Kenya, and Tanzania are examined in this research.

OBJECTIVE

This research examines cattle market integration in three developing countries of Mali, Kenya, and Tanzania. Cattle price discovery and leadership were as well studied. We used weekly cattle prices in the three case studies. Data in Mali were collected on 6 markets from November 2008 to September 2010. Data in Kenya were collected from June 2006 to December 2009 on 6 markets while in Tanzania prices were collected on 4 markets from February 2006 to January 2010.

THEORETICAL BACKGROUND

- Competitive market and equilibrium: general equilibrium theory by Arrow and Debreu (1954)
- Role of information in economics (Stigler 1961; Stiglitz 1985)
- Spatial equilibrium model and the Law of One Price

METHODS

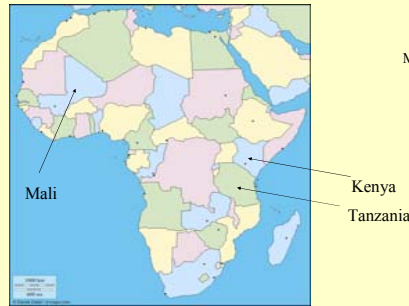
- Error correction model:

$$\Delta P_t = \text{IIP}_{t-1} + \sum_{i=1}^p \Gamma_i \Delta P_{t-i} + \mu + e_t$$
- Vector autoregression

$$\text{VAR: } x_t = A_0 + A_1 x_{t-1} + e_t$$
- Innovation accounting

$$\text{VMA: } P_t = \sum_{i=0}^{\infty} c_i e_{t-i}$$
- Directed acyclic graphs (DAG)

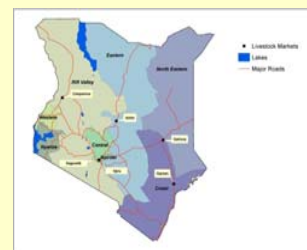
CASE STUDIES



Mali cattle markets



Kenya cattle markets



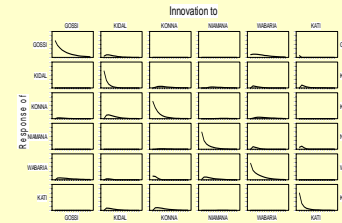
Tanzania cattle markets



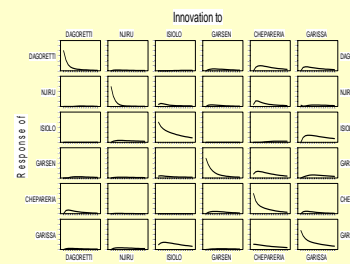
RESULTS

Impulse Response Function

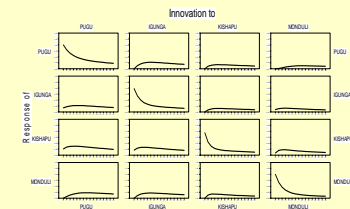
Mali: **markets are less integrated**



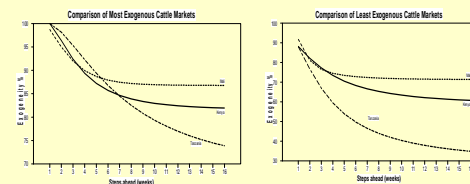
Kenya: **markets show signs of integration**



Tanzania: **markets show strong signs of integration**



Comparison of exogeneity level between Mali, Kenya, and Tanzania



CONCLUSIONS

- Mali: markets are less integrated, exhibiting signs of independence across time
- Kenya: markets are integrated, showing signs of price interdependence across time with Chepareria leading
- Tanzania: markets are integrated and show strong signs of price interdependence with Pugu as a leader
- Cattle markets are more integrated (less exogenous) in Tanzania and Kenya than in Mali with Tanzania showing a higher level of integration
- Possible reasons:

- ❑ livestock market information system that uses cell phone to disseminate price data has been in place longer in Tanzania and Kenya than in Mali
- ❑ Government involvement in multiplying the price information channels is more noticed in Tanzania than Kenya and Mali

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FURTHER INFORMATION

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The views presented here are those of the authors.