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# Market participation and choice of marketing channel under liquidity constraints: Evidence from the Zambian maize market

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## Introduction

- **Increased market participation** of smallholders in ag output markets is key for lifting farmers out of **low-productivity, high-risk subsistence farming**<sup>1,2</sup>
- But **market participation** is low in many developing countries due to:
  - High **transaction costs**<sup>3</sup> in ag. input and output markets
    - e.g., poor infrastructure, lack of information,<sup>4,5</sup> inadequate public and private assets<sup>6,7,2</sup>
  - And constraints to the **production of a marketable surplus** due to
    - Competing HH consumption needs
    - Poor access to agricultural inputs<sup>8,9</sup>

## Maize Markets, Market Participation, & Marketing Channels in Zambia

- **Maize is an economically and politically important crop in Zambia**<sup>13</sup> and throughout Eastern and Southern Africa<sup>2</sup>
- **Approx. 90%** of Zambian smallholder households grow maize
- **Maize market participation as net sellers is far from universal** (e.g., 57% of Zambian smallholder maize growers were net sellers in the 2014/15 marketing year)
- Important **maize marketing channels in Zambia**:
  - Government parastatal **Food Reserve Agency (FRA)**: criticized for favoring larger farmers<sup>14, 15, 16</sup>
  - **Private traders**: accused of being “exploitative briefcase businessmen” by government<sup>17</sup>
  - Other **local households**

## Contributions and Hypotheses

- **Focus/contributions of this paper**:
  - **Effects of liquidity constraints** (as measured by the farmer’s expressed inability to invest in a productivity-enhancing agricultural technology like fertilizer) on the **market participation decision of the farmer**.
  - Differentiating the **impact of expected and current period prices on market participation**
  - Studying the **choice of marketing channel for a staple crop (maize)** amongst several buyer types (past studies focus more on market location and cash crops)
- **Hypotheses - Liquidity constrained households** are:
  - Less likely to act as net sellers** of maize in the market compared to the unconstrained counterparts,
  - Less responsive to remunerative prices** due to constraints on expansion of output, and
  - Less likely to sell to the FRA**, because its time of entry into the market is uncertain and payments are delayed

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## MAIN RESEARCH QUESTIONS

1. Do **liquidity constraints** reduce the probability of a household being a net seller (e.g., of maize in Zambia)?
2. Does **responsiveness to output prices** differ between liquidity constrained and unconstrained households?
3. Do **liquidity constraints** affect farm households’ choice of marketing channel if some channel entails uncertainty in the timing of market entry and delayed payments?



## KEY FINDINGS

1. **Liquidity-constrained HHs are 15 percentage points less likely to be net sellers** of maize (Table 1)
2. A 1-ZMW increase in the current maize price is associated with a **decrease in the probability of being a net seller** by 35 percentage points for liquidity-constrained HHs vs. 6 percentage points for liquidity-unconstrained HHs (Table 1)
3. A 1-ZMW increase in a farmer’s expected maize price is associated with a **20 percentage point increase in the probability of being a net seller** for both HH types (Table 1)
4. HHs that are **liquidity-constrained during the production period** are **1.2 times more likely to sell to the FRA**, despite it entailing uncertain timing of market entry & delayed payments (Table 2)

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## Data

- **2012 and 2015 Rural Agricultural Livelihood Surveys (RALS)**
- **Nationally representative panel of smallholder farm households in Zambia** covering the:
  - 2010/11 and 2013/14 agricultural years (October-September)
  - 2011/12 and 2014/15 maize marketing years (May-April)
- **Analytical sample:** All maize-growing HHs in the unbalanced panel (12,538 observations)

## Methods

The analysis is carried out in three stages:

### Stage 1. HH liquidity status: Correlated Random Effects (CRE) Probit

- Dependent variable =1 if a HH is liquidity-constrained, =0 if unconstrained
- Generate Inverse Mills Ratio (IMR)

### Stage 2. Choice of maize market position: CRE Ordered Probit

- Include IMR as an additional regressor to address potential endogeneity of liquidity status to a HH’s maize market position

### Stage 3. Choice of maize marketing channel: CRE Multinomial Logit

- Net selling HH’s choice among selling to FRA vs. another HH vs. a private trader
- Limitation: Sample selection bias (Results may reflect the effect of unobserved factors that determine both market position and choice of market channel)

## Results

**Table 1: Key factors affecting a HH’s probability of being a maize net seller (APEs) (selected results - Stage 2)**

Key variables of interest	All HHs	Liquidity constrained	Liquidity unconstrained
HH is liquidity-constrained (=1)	-0.15***		
Current maize price <sup>#</sup> (ZMW/kg)	-0.18***	-0.35***	-0.06**
Expected maize price <sup>‡</sup> (ZMW/kg)	0.13***	0.18***	0.19***

**Table 2: Relative risk ratios of choosing to sell the largest transaction of maize to FRA vs. other households compared to private traders (selected results - Stage 3)**

Key variable of interest	Marketing channel	
	FRA	Other HH
HH is liquidity-constrained (=1)	1.23**	1.67***

<sup>#</sup>Farmgate maize price net of transport costs as of present marketing season

<sup>‡</sup> Average district maize retail price as of planting time

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Policy Implications

1. Addressing liquidity constraints that impact productivity enhancing investments could lead to encouraging more smallholders to become net sellers of agricultural products.
2. The impact of price policy on smallholder’s market participation could be different based on whether it is expected or current prices that are being affected.

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