Consumption-Side Separability Test of Agricultural Households

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Introduction

Can policymakers seeking to improve nutrition through agricultural interventions rely on markets?

- **If yes:**
    - Prices of desired foods can be lowered by raising their productivity generally, and consumers will demand more of them

    - Incomes of smallholder farmers can be raised by improving their productivity generally for whichever crops are most profitable on their fields

- **If no:**
    - Improve productivity (and promote production) of specific crops for specific households

Introduction

The canonical farm household model suggests that farm households first maximize their profitability then use those profits to consume what they most prefer

- This model relies on the assumption that markets for outputs and inputs are full and complete

- If these assumptions are violated, then farmers may rationally alter their behavior in response to market frictions

- Whether markets are functioning well helps to know which interventions will best achieve improved nutrition

  - **Functioning markets:** improve farmers incomes so they can afford healthier foods
  - **Poorly functioning markets:** promote specific frop mixes for the dual objectives of agriculture and nutrition.

Methodological Approach

- We develop a test for whether smallholder farmers rely on markets or whether they "separate" from them

- The test is based on whether their preferences for foods affect their choice of crops grown

- If a household changes land allocated to a crop, it should only affect the intake of foods through total farm profit effects

- We test our hypothesis using 6 consumption waves of the Nigerian LSMS-ISA data

- First, we estimate a consumer demand model and then we use the structural parameters to test our hypothesis.
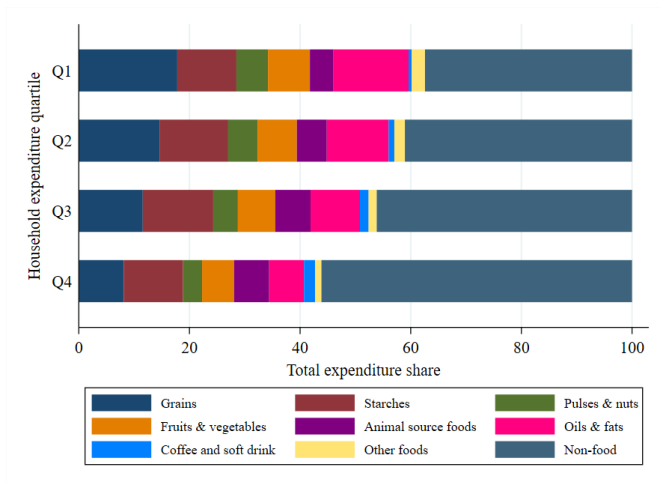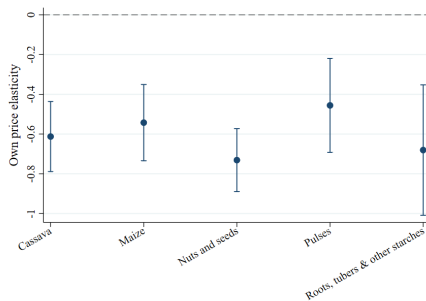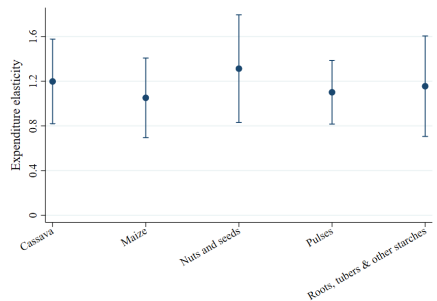
Budget share on food and non-food

Figure: Budget share on food and non-food. Q1 to Q4 represent the expenditure quartiles from low-income to high-income households

Own-Price & Expenditure Elasticities

(a) Own-price

(b) Expenditure

Figure: Demand elasticity for the 5 food groups used in the test
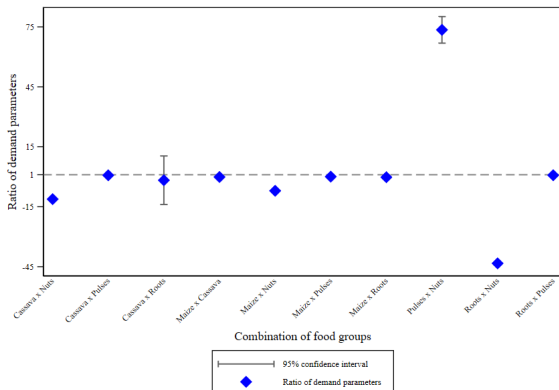
Separability test results

Figure: Ratios of demand parameters for the sample

Notes: Our null hypothesis (markets work) implies the ratio of demand parameters for two different crops equals one

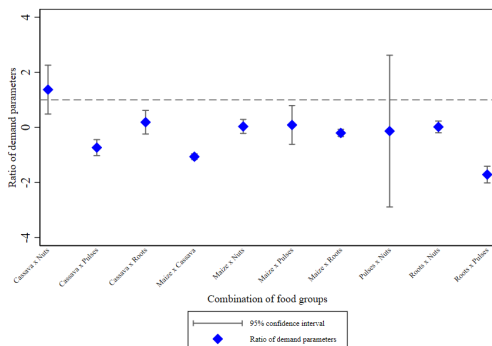# What if farm income is the only source of income?

Figure: Ratios of demand parameters for households with farm income only

Notes: We include households with farming income as the sole source of income. The null hypothesis (markets work) implies the ratio of demand parameters for two different crops equals one

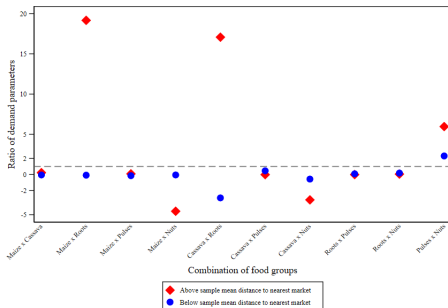# Do farmers who are farther away from markets show less trust in markets?

Figure: Ratios of demand parameters for households above and below sample median distance to markets

Notes: The null hypothesis (markets work) implies the ratio of demand parameters for two different crops equals one

Conclusions & Implications

- Evidence that Nigerian farmers' consumption is driven by what they grow

- Findings confirm evidence of market failure in ag. markets as widely documented in sub-Saharan Africa

- **Implications for agricultural and food interventions and policy:**

    1. Improving agricultural markets is a priority, so that agricultural productivity growth can better contribute to improved nutrition

    2. Promote a diverse crop portofio with the goal to improve households' diet but also to increase their farm profits

Thank you for your attention!

Questions, comments and suggestions

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