Econometric Models of Market Participation

Session prepared for the ACTESA/COMESA training workshop on "Smallholder-led Commercialization and Poverty Reduction: How to achieve it”
Kigali, Rwanda April 18, 2011
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The Traditional Econometric Model

\[ y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \epsilon \]

\[ \text{Talktime} = \alpha + \beta_1 \text{years} + \beta_2 \text{contacts} + \epsilon \]

- Generally assumes the “dependant” variable, \( y \), is continuous.
  (e.g. everyone uses at least some talktime.)
Market Participation Models

- Market Participation (MP) models
  - “Two-stage” or “double hurdle” models
    1) Whether to participate
    2) How much to buy or sell
  - Goetz; Key et. al.; Bellemare and Barrett; etc.

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Goetz Two Tiered Market Participation Model

Decision 1: Probit

- Do not Buy or Sell

Decision 2: Switching Function

- Net Purchases
- Net Sales
Bellemare and Barrett (Two Tiered) “Ordered Tobit” Market Participation Model

Decision 1: Ordered Probit

Decision 2: Truncated Normal (x2)

Market Participation Models

- Market Participation (MP) models
  - “Two-stage” or “double hurdle” models
  - 1) Participation and 2) How much
  - Goetz; Key et. al.; Bellemare and Barrett; etc.

- Models require all observations be producers, so researchers:
  - Focus on staple crops
  - Focus on sub-population of producers
Triple Hurdle Model: Market Participation with Production Decision

Nationally Representative Sample

Decision 1: Probit
- Non-Producers
- Producing Households

Decision 2: Ordered Probit
- Net Buyers
- Autarkic
- Net Sellers

Decision 3: Log-Normal (x2)
- Quantity Bought
- Quantity Sold

Insights from Triple Hurdle Market Participation Model

- Probability of:
  - Not producing
  - Producing, but also being a net buyer.
  - Producing, but not participating in the market
  - Producing and selling

- Expected value of market participants net purchases or net sales

- Expected value of sales and purchases of any household (per household expected values)
Kenyan Dairy Example

- About 85% of E.A. 3.5 million dairy cattle in are in Kenya

- Compared to Maize
  - Nearly all households produce maize
  - Less than 1/2 sell maize to generate cash
  - About 2/3 sell Dairy
  - Top 10% of households generate ~80% of maize revenue, versus ~55% of dairy revenue

Kenyan Dairy Example (2)

- Since private dairy purchasing enterprises became legal, there are 4 major potential buyers of dairy:
  - Kenya Creamery Company
  - Other co-ops
  - Private processors
  - Informal dairy “hawkers” tolerated, not legal

- Despite growth, domestic supply is outpaced by domestic demand and export.

- Why?
What explains Market Participation?

- Transfer cost determinants
- Endowments
- Access to production inputs
- Market Prices
- Production shocks

Exercise using model results