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Market participation and marketing performance: A case study of Bolivian potato farmers

Catherine Larochelle and Jeffrey Alwang, Department of agricultural and applied economics, Virginia Tech
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Introduction

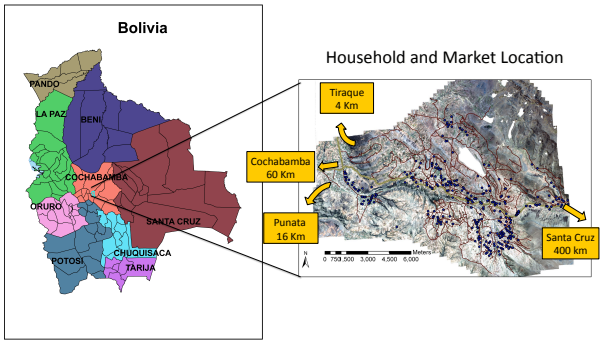
•Potato production is vital for the impoverished households living in the Bolivian Andes.

✓Potato is the main food crop and cash crop followed by Lima beans, cereal, and livestock.

✓Potato sales represent 79.5% of crop revenue and 49.5% of total household revenue.

•Market participation can be used as a tool to lift small-scale farmers out of semi-subsistence farming and poverty trap[1].

•Identifying obstacles to market participation and factors to promote participation in higher-valued markets is primordial to increase farmers' income and welfare.



Research questions

1.What is needed to simulate small-scale farmer market participation and volume sold?

•Hypothesis[2]: ✓Productive assets
✓Improved technology
✓Lower transaction costs

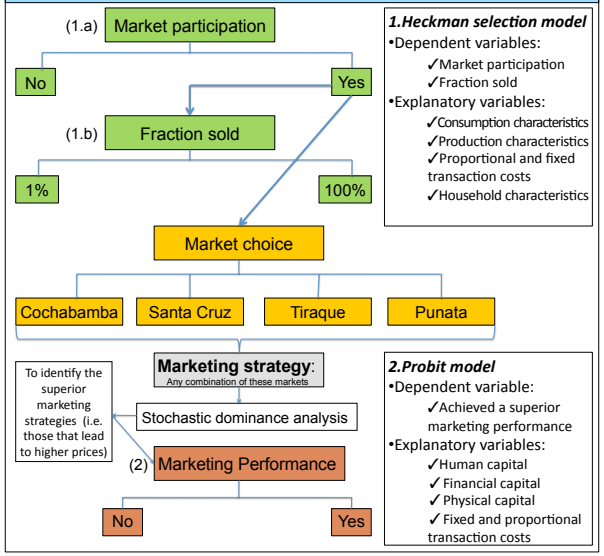
2.What is needed to improve marketing performance?

•Hypothesis: ✓Capital endowment
✓Access to information

Acknowledgment:
We acknowledge funding support from Sustainable Agricultural and Natural Resource Management Collaborative Research Support Program (SANREM CRSP).

Reference:
[1-2]: Barrett, C.B. (2008), Smallholder market participation: Concepts and evidence from eastern and southern Africa, *Food Policy* 33(4): 299-317.

Conceptual and empirical framework



1.Heckman selection model
•Dependent variables:
✓Market participation
✓Fraction sold
•Explanatory variables:
✓Consumption characteristics
✓Production characteristics
✓Proportional and fixed transaction costs
✓Household characteristics

2.Probit model
•Dependent variable:
✓Achieved a superior marketing performance
•Explanatory variables:
✓Human capital
✓Financial capital
✓Physical capital
✓Fixed and proportional transaction costs

Data

- Survey data:
  - ✓352 potato farmers
  - ✓Data on agricultural activities, market participation, household characteristics, etc.
- GIS Data:
  - ✓Geo-referenced household location
  - ✓GIS data for road network, elevation, soil, etc.
- Market participation:
  - ✓90% of households sold potatoes
  - ✓Households sold an average of 64% of production
- Market choice:
  - ✓72.9% of households sold potatoes in Tiraque
  - ✓40.7% of households sold potatoes in Punata
  - ✓19.2% of households sold potatoes in Cochabamba
  - ✓7.6% of households sold potatoes in Santa Cruz
  - ✓67.8%, 24.9%, 6.3%, and 0.9% of households sold potatoes in 1,2,3, and 4 markets
- Prices:
  - ✓Average net price received is 139 BS/100 Kg potatoes (±29)
  - ✓Selling potatoes in more than one market and selling potatoes in Santa Cruz and Cochabamba yielded to higher net prices.
- Marketing strategies:
  - ✓Five superior marketing strategies were identified:
    1. Cochabamba
    2. Santa Cruz-Cochabamba
    3. Punata-Tiraque
    4. Punata-Tirque-Santa Cruz
    5. Punata-Tiraque-Cochabamba
  - ✓30.6% of households selected a superior marketing strategy (i.e. achieved a superior marketing performance).

Results and conclusion

Market participation	Faction sold
Production characteristics	
• Technical efficiency and the number of field a household owned have a small and positive impact on market participation.	• 1 ha increase in farm size leads to a 1.5% increases in the fraction sold. • Tractor ownership increases the fraction sold by 4.8%. • A 10% increase in technical efficiency increases the fraction sold by 3.1%.
Transaction costs	
• Proportional and fixed transactions do not have a significant impact on market participation.	• Living 1 km closer to the Tiraque market leads to a 1% increase in the fraction sold. • Living 1 km further away from the paved road reduces the fraction sold by 3.7%.
Household characteristics	
• The age of the household head has a negative impact while being a female household head has a positive impact on market participation.	• Being a female household head reduces the fraction sold by 10.3% while the ratio adult of females has a positive impact on quantity sold.

Marketing performance

Human capital
- One-year increase in the household head age reduces the probability of selecting a superior marketing strategy by 1.9%
- An additional family member increases the probability of selecting a superior marketing strategy by 5%.
- A 10% increase in the ratio of adult females increases the probability of selecting a superior marketing strategy by 3.2%.

Financial capital
- A 10% increase in the fraction of potato sold increases the likelihood of selecting a superior marketing strategy by 2.1%.

Physical capital
- 1 ha increase in farm size increases the probability of selecting a superior marketing strategy by 4.4%.

Transaction costs
- Owning a radio increases the probability of selecting a superior marketing strategy by 13.8%.
- Living 1 km closer to the Tiraque market increases the likelihood of selecting a superior marketing strategy by 11.5%.

Policy implications

Farmers' income can be increased trough:

Increased market participation	Improved marketing performance
By providing technical assistance	***By improving access to market information***
⇩	⇩
Increase agricultural productivity	Better informed about price
By improving road quality and transportation alternatives	
Reduce proportional transaction costs, i.e. transportation costs	Reduce fixed and proportional transaction costs, i.e. search costs and transportation costs
By implementing microfinance programs	
Facilitate acquisition of productive assets ⇩ Increase agricultural production	Cover transportation costs of reaching the further way markets
⇩	⇩
Greater volume sold	**Higher price**

Risk is a limiting factor

Risk of not meeting the family consumption needs by participating in the market.	Greater price uncertainty and higher transportation costs when selling in the further away markets.