

# Unpacking the meaning of “market access”: evidence from Kenya & Zambia

Jordan Chamberlin, Thom Jayne, Antony Chapoto  
Department of Agricultural, Food & Resource Economics  
Michigan State University



# Market Access

- Major component of prevailing development narrative
  - particularly in sub-Saharan Africa
- Strong theoretical implications
  - although not necessarily *precise* implications
- Policy context
  - Serious concern about effects of liberalization
    - withdrawal of state marketing boards from marketing landscape
  - Remoteness/access problems continue to be major feature of smallholder marketing in SSA
    - Empirical vacuum?



# Goals of this paper

- Check in with the data
  - How bad is it really?
  - Case studies: post-liberalization Kenya & Zambia
- Unpacking the idea: what do we really mean by market access?
  - Conceptual looseness → empirical uncertainty
  - Definition of indicators
  - Assumptions about information content of indicators

# Roadmap for this presentation

- 1 Theoretical perspectives
- 2 Empirical evidence in recent literature
- 3 Case studies: Kenya & Zambia
- 4 Critique of conventional *ad hoc* approaches & suggestions for future investigations

# Conventional wisdom

- Farmers in remote places face higher input costs, lower output prices, higher search costs, higher information costs, and fewer trading partners and opportunities
  - Implicit suggestion that this is very pervasive
- These barriers effectively lock many farmers out of the agricultural transformation that is central to development policy
  - subsistence* → *market orientation, specialization*

# Theoretical perspectives

## Transactions costs

- Variable
  - Unit transfer costs (spatial price formation)
- Fixed
  - information acquisition
  - search, negotiation & enforcement costs

## As costs of accessing markets ↓:

- ↗ market orientation
- ↗ use of inputs
- ↗ specialization
- ↗ diversification
- ↗ productivity
- ↗ off-farm employment
- ↗ household income

## Multidimensionality

- “remoteness”
- e.g. access to health care  
→ labor productivity

## Better integrated markets...

- Trader competition
- Prices
- Distance from farm to sale

# Empirical evidence is complex...

## Examples from Ethiopian highlands

- access to roads → no significant impact on profitability or productivity (Pender *et al.* 1999)
- better access to towns → cereals-perennial production as livelihood strategy & other welfare & NRM indicators; access to all-weather roads had less significant impacts (Pender *et al.* 2001)
- multivariate access factor → more production of teff, less sorghum, less livestock, & greater household wealth (Kruseman *et al.* 2006)
- access to roads & towns → increased use of labor, oxen & fertilizer; access to towns → higher crop productivity; neither factor associated with household income (Pender & Gebremedhin 2006)
- access to markets & roads → higher input use & LM practices (impacts vary by AEZ); crop yields higher further from roads in high potential areas & not significant elsewhere (Benin 2006)

# Review of 40 recent empirical studies: analytical conclusions vary widely

## Wide variety of indicators:

### Simple measures

- presence of all-weather road
- the number of connecting roads in the village
- walking time to local market
- km the nearest market town
- cost in local currency to transport a bag of maize from the farm to the main market

### Compound measures

- indices constructed from multiple measures of market distance and/or type of infrastructure

### Ambiguous criteria for “market”

- population size?
- presence of people buying or selling specific food products?
- assembly or retail market?
- multiple markets (e.g. for different commodities) not addressed

### Referents

“district town,” “local market,”  
“main market,” etc.

# Case studies: Kenya & Zambia

- Nationally representative surveys
- Kenya
  - 1,233 panel households:
  - 1997, 2000, 2004, 2007, 2010
- Zambia
  - 4,284 panel households:
  - 2004, 2008

<b>Variable</b>	<b>Investment type</b>
Km to point of maize sale transaction with private trader*	Private
Km to nearest private fertilizer retailer	Private
Km to private veterinary services	Private
Km to public telephone (landline or mobile)	Both
Km to extension advice	Public
Km to a motorable road	Public
Km to a tarmac road	Public
Km to piped water source	Public
Km to health centre	Primarily public
Km to electricity supply	Public

# Mean kilometer distance from farm household to various markets and services, Kenya, 2010

Agroecological zone	maize point of sale	fertilizer seller	veterinary service	telephone service	extension service	motorable road	tarmac road	improved water	health center	electricity service
Coastal Lowlands		5.67	7.36	4.16	7.15	1.75	8.83	3.77	2.84	1.89
Eastern Lowlands	1.21	3.78	6.19	5.35	7.48	0.49	11.49	1.37	3.34	2.26
Western Lowlands	0.63	4.31	4.85	3.97	5.38	0.69	5.38	6.43	2.56	2.15
Marginal Rain Shadow	0.59	2.92	3.25	5.59	3.33	0.16	17.19	10.13	2.31	2.09
Western Transitional	0.70	4.06	3.85	3.99	4.91	0.34	7.87	4.02	2.49	2.04
High Potential Maize	1.28	4.95	5.08	5.38	6.01	0.38	6.65	6.41	3.44	2.13
Western Highlands	0.98	2.74	3.39	3.71	4.53	0.51	5.16	5.39	2.64	1.27
Central Highlands	0.12	1.46	2.67	2.77	3.60	0.13	4.98	0.08	2.53	0.37
<i>Total</i>	<i>0.85</i>	<i>3.70</i>	<i>4.46</i>	<i>4.29</i>	<i>5.33</i>	<i>0.46</i>	<i>7.13</i>	<i>4.07</i>	<i>2.88</i>	<i>1.69</i>
medians:	<i>0.00</i>	<i>3.00</i>	<i>3.00</i>	<i>3.00</i>	<i>4.00</i>	<i>0.20</i>	<i>5.00</i>	<i>2.00</i>	<i>2.00</i>	<i>1.00</i>

# Household distances to markets and services, 2010

Kilometers to nearest

Household-level percentile	point of maize sale	fertilizer seller	veterinary service	telephone service	extension service	motorable road	tarmac road	improved water source	health center	electricity
<b>Relatively accessible villages *</b>										
10 <sup>th</sup>	0.0	0.5	0.5	0.6	1.0	0.0	0.5	0.0	1.0	0.0
25 <sup>th</sup>	0.0	1.0	1.5	1.5	2.0	0.0	1.5	0.0	1.3	0.2
50 <sup>th</sup>	0.0	2.5	3.0	3.0	4.0	0.1	4.0	1.5	2.0	0.7
75 <sup>th</sup>	0.0	4.3	5.0	5.4	6.0	0.5	7.0	4.0	3.5	2.0
90 <sup>th</sup>	2.6	7.0	7.6	7.5	8.0	1.0	10.0	7.2	5.0	4.0
95 <sup>th</sup>	3.5	8.0	8.0	8.0	9.0	1.5	15.0	9.0	6.0	5.0
99 <sup>th</sup>	8.0	15.0	17.0	15.0	17.0	3.0	40.0	20.0	9.0	8.0
<b>Relatively Remote villages *</b>										
10 <sup>th</sup>	0.0	1.0	1.0	1.0	1.0	0.0	1.0	0.0	0.8	0.1
25 <sup>th</sup>	0.0	1.5	2.0	1.5	2.0	0.1	3.0	0.3	1.2	0.5
50 <sup>th</sup>	0.0	3.0	3.0	3.0	4.0	0.2	7.0	2.0	2.0	1.4
75 <sup>th</sup>	0.5	5.0	7.0	6.0	10.0	0.5	13.0	6.0	4.0	3.0
90 <sup>th</sup>	2.0	10.0	12.0	12.0	14.0	1.5	20.0	15.0	6.0	5.0
95 <sup>th</sup>	7.0	12.0	15.0	15.0	17.0	2.5	25.0	27.0	10.0	5.2
99 <sup>th</sup>	25.0	19.0	21.0	27.0	30.0	6.0	40.0	37.0	15.0	12.0

# Maize marketing in “accessible” vs “remote” villages

	<i>2009 Maize Marketing Survey</i>	
	Relatively accessible villages	Relatively remote villages
Villages in sample	14	19
Households in sample	-	-
% of village households selling maize	90.80%	91.40%
% of maize sales through...		
small traders	54%	57%
large traders	22%	24%
NCPB	-	-
other households	11%	7%
Avg # of traders operating in village	94	83
Avg distance to point of sale	2.5	1.0
Share of sales at farm gate	72%	74%
Average price at farm gate (Ksh/kg)	22.1	21.2

# Correlation across indicators

Kilometers to nearest

**2010**

	point-of-sale for maize	fertilizer seller	veterinary service	telephone service	extension service	motorable road	tarmac road	improved water source	health center
maize point-of-sale	1								
fertilizer seller	0.07	1							
veterinary svc	0.02	0.38 ***	1						
telephone service	0.10 **	0.32 ***	0.25 ***	1					
extension service	0.02	0.38 ***	0.70 ***	0.34 ***	1				
motorable road	0.07	0.16 ***	0.25 ***	0.01	0.20 ***	1			
tarmac road	0.07	0.12 ***	0.19 ***	0.13 ***	0.22 ***	0.20 ***	1		
improved water source	0.04	0.27 ***	0.23 ***	0.17 ***	0.21 ***	0.12 ***	0.34 ***	1	
health center	0.13 ***	0.32 ***	0.31 ***	0.35 ***	0.27 ***	0.07 **	0.06 **	0.20 ***	1
electricity	0.03	0.29 ***	0.27 ***	0.29 ***	0.25 ***	0.22 ***	0.23 ***	0.25 ***	0.27 ***

**Most in range ~ .20-.40**

Kilometers to nearest

**1997**

	point of sale	fertilizer seller	veterinary service	telephone service	extension service	motorable road	tarmac road	improved water source	health center
maize point-of-sale	1								
fertilizer seller		1							
veterinary svc			1						
telephone service				1					
extension service					1				
motorable road	0.15 ***	0.24 ***	0.21 ***	0.10 ***	0.12 ***	1			
tarmac road	0.15 ***	0.36 ***	0.30 ***	0.44 ***	0.22 ***	0.23 ***	1		
improved water source	0.06	0.37 ***	0.24 ***	0.37 ***	0.17 ***	0.26 ***	0.61 ***	1	
health center	0.00	0.00	0.34 ***	0.19 ***	0.25 ***	0.11 ***	0.10 ***	0.16 ***	1
electricity	0.03	0.32 ***	0.24 ***	0.49 ***	0.17 ***	0.21 ***	0.65 ***	0.68 ***	0.19 ***

Any single indicator would be a poor reflection of multivariate access conditions at any point in time, or of changes in those conditions over time



# Distance to Location of the Maize Sales Transaction by Percentile of Distance to the Nearest District Town

Percentile group of distance to the District Town	Distance to location of the maize sales Transaction from homestead						% of state marketing board purchases
	-----percentile-----						
	<i>mean</i>	<i>10</i>	<i>25</i>	<i>50</i>	<i>75</i>	<i>90</i>	
<b>Zambia</b>	-----Kilometers-----						
Accessible: Bottom 25%	3.61	0	0	0	1.6	8	57.2%
Mid accessible Mid bottom 25%	6.78	0	0	0	3	25	7.2%
Mid inaccessible: Mid 25%	7.33	0	0	0	3	35	19.7%
Inaccessible: Top 25%	10.84	0	0	0	3	60	15.9%
<i>All</i>	7.14	0	0	0	2	23	100.0%
<b>Kenya</b>	-----Kilometers-----						
Accessible: Bottom 25%	0.32	0	0	0	0.5	1	NA
Mid accessible Mid bottom 25%	0.14	0	0	0	0	0.65	NA
Mid inaccessible: Mid 25%	0.27	0	0	0	0	1	NA
Inaccessible: Top 25%	2.23	0	0	0	0	3	NA
<i>All</i>	0.78	0	0	0	0	1	

Trader  
concentrations

	Households selling maize	Number of private buyers who come into village	
		Among maize sellers	Among non-maize sellers
<b>Zambia, 2010/11</b>	%	<i>mean</i>	<i>mean</i>
<i>Province</i>			
Central	52.5	6.9	4.3
Copperbelt	42.3	15.1	15.2
Eastern	35.6	6.6	5.7
Luapula	29.3	8.5	6.4
Lusaka	35.1	2.7	2.6
Northern	41.7	5.4	3.1
Northwestern	43.0	13.2	2.1
Southern	43.8	5.5	2.3
Western	18.8	5.4	2.8
<i>National</i>	<i>38.4</i>	<i>7.4</i>	<i>4.9</i>
<b>Kenya, 2010</b>	%	<i>mean</i>	<i>mean</i>
<i>Agrecological zone</i>			
Coastal Lowlands	9.5	1.5	4.4
Eastern Lowlands	26.4	4.0	3.0
Western Lowlands	19.3	4.8	4.3
Marginal Rain Shadow	25.3	5.4	4.5
Western Transition	39.0	10.5	6.7
High Potential Maize	49.2	9.3	6.8
Western Highlands	35.2	5.9	4.2
Central Highlands	25.8	3.9	2.3
<i>National</i>	<i>32.7</i>	<i>7.3</i>	<i>4.7</i>

# Summary: smallholder access in Kenya & Zambia

- **Multidimensional story**
  - Many farmers still remote by conventional definitions
  - However, there are other indicators that smallholders' access to markets & services better than conventional definitions would suggest
- **General improvement over last decade**
  - Across indicators & across geography
  - Responses lagging?
- **Private vs public differences**
  - Evidence of new private sector investment strongest in relatively low-potential regions, historically underserved (response to liberalization)
  - Marketing boards not serving the most remote
- **Low correlation across indicators**
  - Indicator choice matters
  - Critique of infrastructural determinism

# Why is this important?

- If we're not measuring the right thing, analytical conclusions may be wrong
  - inconsistent estimators
- Analytical conclusions are driving the allocation of finite development resources
  - welfare outcomes in developing countries

# Lest someone take away the wrong message...

- We are not trying to trivialize the market access problems faced by smallholders
  - These are real and significant
- We're saying let's make sure we get the problems right
  - Important not to divert attention & resources from the most pressing constraints to market dev't



the end

# % reduction in median distance

1997 to 2010  
by agroecological zone

