

# Unpacking the meaning of “market access” in Kenya

Jordan Chamberlin & Thom Jayne

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
- Last decade+: major infrastructure investments throughout region
  - what impacts?



# Unpacking the idea

- What do we really mean by market access?
  - Conceptual looseness → empirical uncertainty
  - Definition of indicators
  - Assumptions about information content of these indicators
- Case study: Kenya post-liberalization decade

# This presentation...

- 1 Theoretical perspectives
- 2 Empirical evidence
- 3 Case study: Kenya
- 4 Critique of the ad hoc approach & suggested framework for future investigations

# Stylized argument

- Farmers in remote places face higher input costs, lower output prices, higher search costs, higher information costs, and less competition in intermediary services markets
- 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

## Stronger market participation:

- Markets more robust: fewer opportunities for informational rents, anti-competitive behavior of intermediaries

# 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)

# Indicators used in empirical studies

## 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

## Missing 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: “local market,” “main market,” “district town,” “market/supply depot”

**Analytical conclusions varied widely**

# Case study: Kenya

- Nationally representative survey
- Panel periods: 1997, 2000, 2004, 2007, 2010
- 1,233 households

<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, 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>

# Household distances to markets and services, 2010

Kilometers to nearest

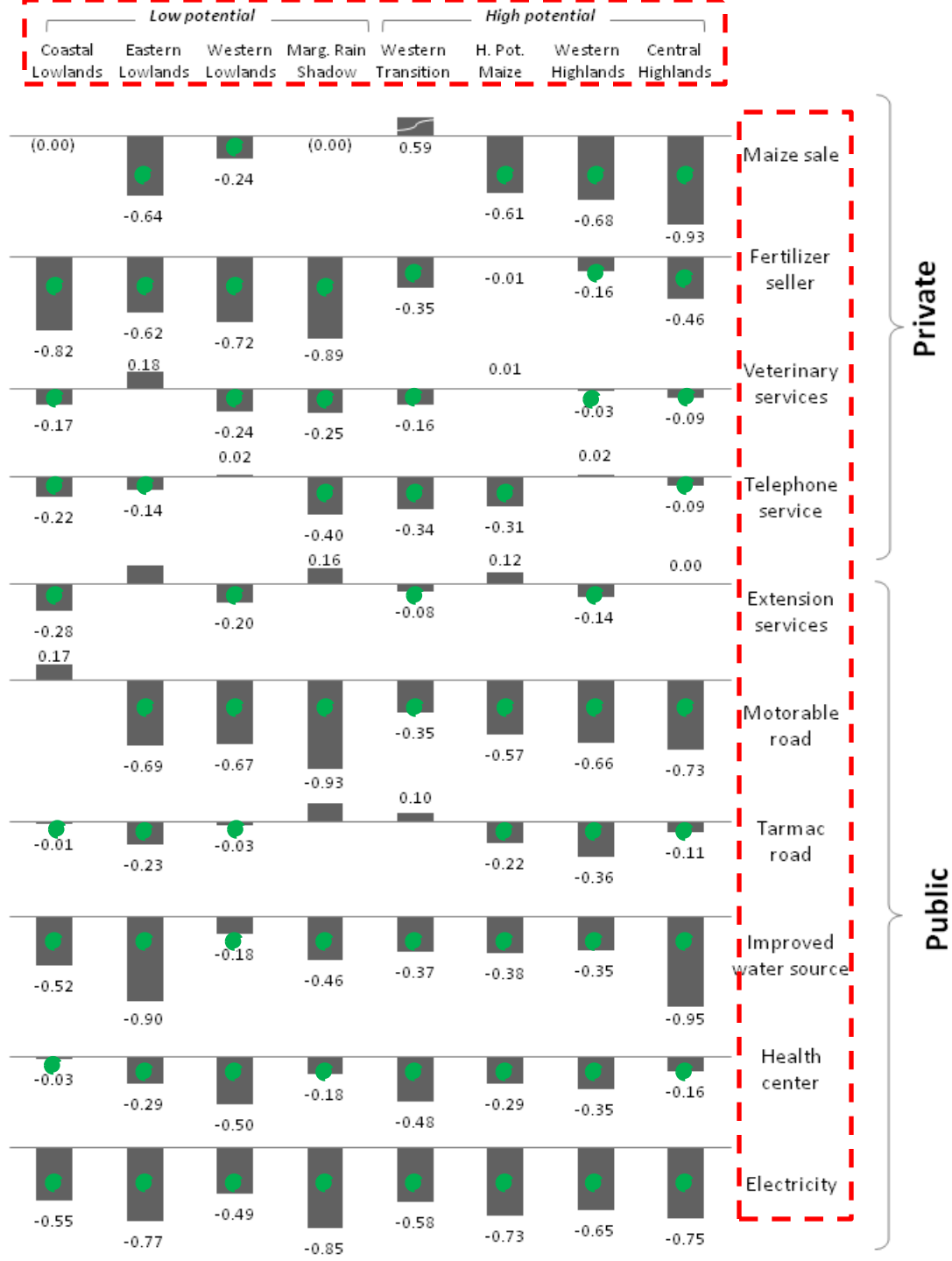
Household-level percentile	point of maize sale	fertilizer seller	veterinary service	telephone service	extension service	motorable road	tarmac road	improved water source	health center	electricity
<b>Relatively accessible villages *</b>										
10 <sup>th</sup>	0.0	0.5	0.5	0.6	1.0	0.0	0.5	0.0	1.0	0.0
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>		<i>2010 Rural Household Survey</i>	
	Relatively accessible villages	Relatively remote villages	Relatively accessible villages	Relatively remote villages
Villages in sample	14	19	58	49
Households in sample	-	-	655	578
% of village households selling maize	90.80%	91.40%	37.56%	34.95%
% of maize sales through...				
small traders	54%	57%	34%	26%
large traders	22%	24%	41%	59%
NCPB	-	-	1%	5%
other households	11%	7%	24%	9%
Avg # of traders operating in village	94	83	-	-
Avg distance to point of sale	2.5	1.0	0.6	1.2
Share of sales at farm gate	72%	74%	78%	80%
Average price at farm gate (Ksh/kg)	22.1	21.2	20.7	20.7

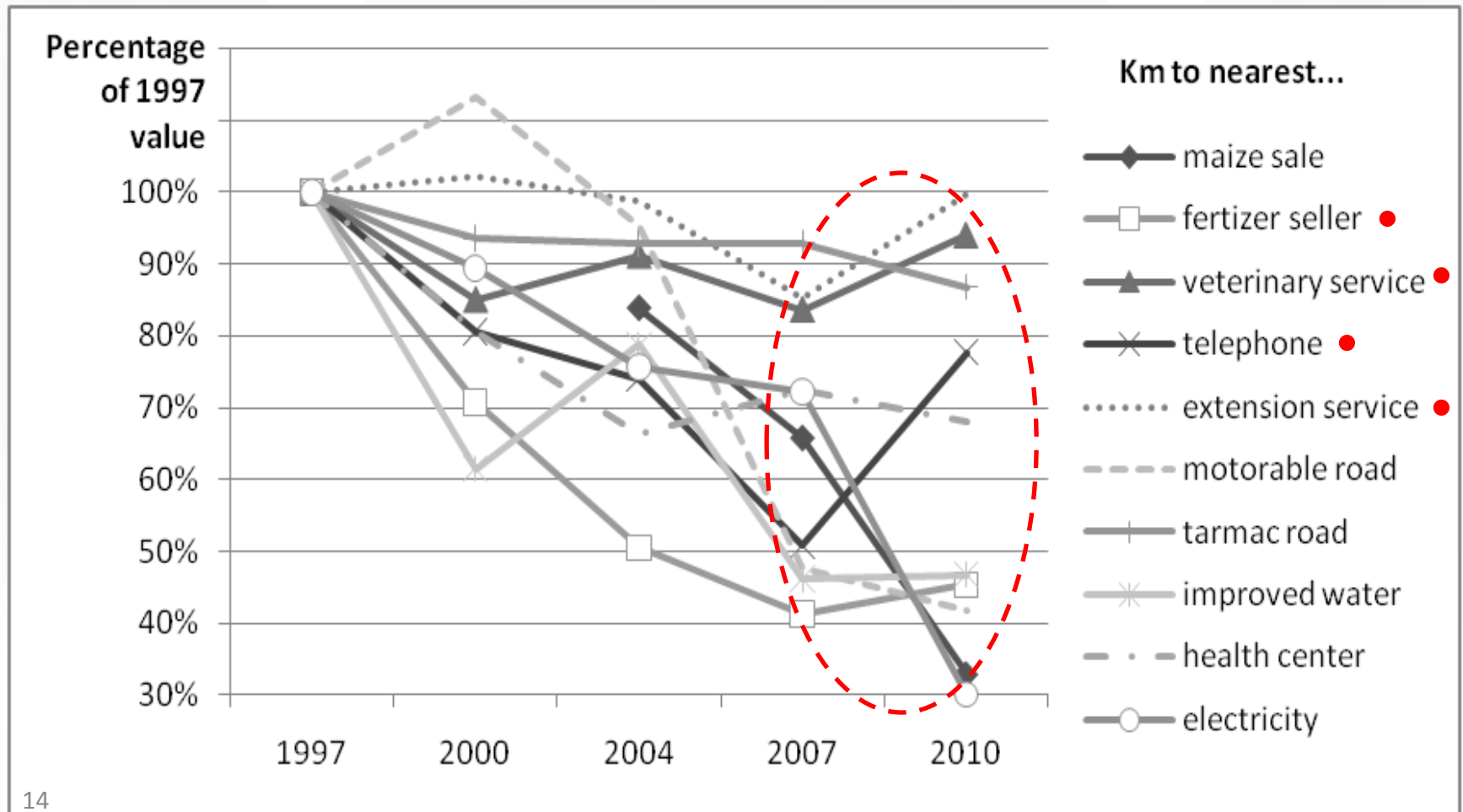
# % reduction in median distance

1997 to 2010  
by agroecological zone



# Relative changes in mean indicator values

indexed to 1997



# 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

# Summary: access changes in Kenya

- **Multidimensional story**
  - Many farmers still remote
  - Other indicators of robust local markets
- **General improvement**
  - Across indicators & across geography
  - Civil unrest may have impacts on some dimensions of access
- **Private vs public differences**
  - Public sector investments geographically distributed
  - Private sector investments as liberalization response (esp. fert. retail)
  - Strongest in relatively low-potential regions, historically underserved
- **Low correlation across indicators**

# Why is this important?

- If we're not measuring the right thing, analytical conclusions may be wrong
  - Inconsistent estimators of partial effects (endogeneity)
- Analytical conclusions are driving the allocation of finite development resources
  - Welfare outcomes in developing countries

# Conceptual checklist for considering candidate access indicator(s)

- *Specificity of access indicators to the issue being addressed*
  - from farmgate, grain may go local buyers in village, bananas to nearest city, cotton to the nearest ginnery, etc.
- *Variation over time*
  - temporal dynamics of accessibility: seasonality; stability
- *Liberalization and technology changes*
  - telecommunication & information technologies which reduce transaction costs & extend geographical thresholds of viable market participation
- *Infrastructural and non-infrastructural components of access*
  - question assumptions about market access conditions (e.g. competitiveness) based on physical infrastructure



the end