

# Urban proximity, demand for land and land prices in Malawi

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# Introduction

- African cities are growing rapidly
- Urbanisation is driven by population growth from
  - Natural increase and rural-urban migration
- This has led to increasing urban–rural space (reclassifying boundaries)
- There is now demand for land and markets are growing in SSA
  - Depending on tenure institutions, political economy and shock effects

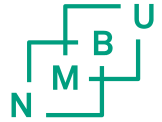
# Introduction

- Land values and prices in these markets have not been subject to much research in SSA
  - We explore this gap with LSMS data from Malawi
- Use Willingness to Accept (WTA) a sale and rent-out of land for household parcel farmland area
- **Objective:** Assess the effect of changing demands for agricultural land on shadow land prices, and their ratio across space and over time.

# Theoretical framework

- Farmland prices decrease with increasing distance from urban centres mainly from transportation costs
  - The von Thünen theory
  - Urban growth model (Capozza and Helsley, 1989)
- That is, unit prices decrease from urban to peri-urban to rural areas
- Both macro and micro economic factors can affect the unit prices. Including;
  - Development cost
  - Expected land use changes
  - Non-land market factors

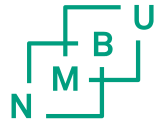
# Theoretical framework



On macro and micro factors, evidence shows that;

- The 2007/08 spike in world energy and food prices induced new demand for land and the associated “land grab” fears in SSA
- However, land supply response was constrained with the fall of prices in 2013, and the policies and political responses to these “land grab” fears.
- This amidst horizontal expansion of African cities from
  - Population growth
  - Urban migration
  - Accessibility to urban centres

# Hypotheses

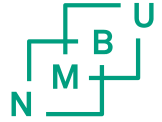


- We hypothesize 4 statements

H1: Shadow land prices are responsive to household farm level population pressure in peri-urban and rural areas.

H2: High food and energy prices during the associated “land grab” period (2007-2013) induced higher expected profitability in farming among smallholder farmers even in remote rural areas, thereby increasing WTA land prices, and especially the land sales prices.

# Hypotheses



- H3: With falling energy and food prices after that, rural land prices have fallen after 2013 and that land prices by 2016 are back to the previous low level in rural areas.
- H4: Land sales prices relative to rental prices (i.e. land price ratio) are higher in peri-urban areas
- Mainly from agricultural to non-agricultural purposes

# Survey method and data

- National representative LSMS – ISA data from Malawi
- Malawi because;
  - High population density (185 persons/km<sup>2</sup>)
  - Expansion of urban-rural area space
    - 4 major cities of Lilongwe, Blantyre, Zomba and Mzuzu
  - Increased demand for land in rural areas between 2009 and 2013 mainly from programs like the Greenbelt initiative
- Three panels in 2010, 2013 and 2016



# Survey method and data

- WTA land prices
  - owned land parcel area only
  - Malawi Kwacha, deflated with CPI of 2010 base year
  - Inverse hyperbolic sine (IHS) for log transformation
- 6,011 household-parcel observations
  - 1,131 HH(2010); 1,471 HH(2013); 1,918 HH(2016)
- Distance to city (km) was from FDG at Enumeration Area
- 102 EAs grouped into quintiles inline with distance to city

# Estimation method

- Hedonic Price method
  - Implicit prices that are differentiated by land related attributes

- Log-linear function with per ha price for parcel area
- Location fixed effect estimator

$$\log WTA_{ijkl}^{S/R_o} = \alpha_0 + \beta_1 D_{ikl} + \gamma_t + \sum_{n=2}^N \beta_n X_{ijkl} + \sum_{m=N+1}^M \beta_m Q_{ijkl} + c_{ij} + \varepsilon_{ijkl}$$

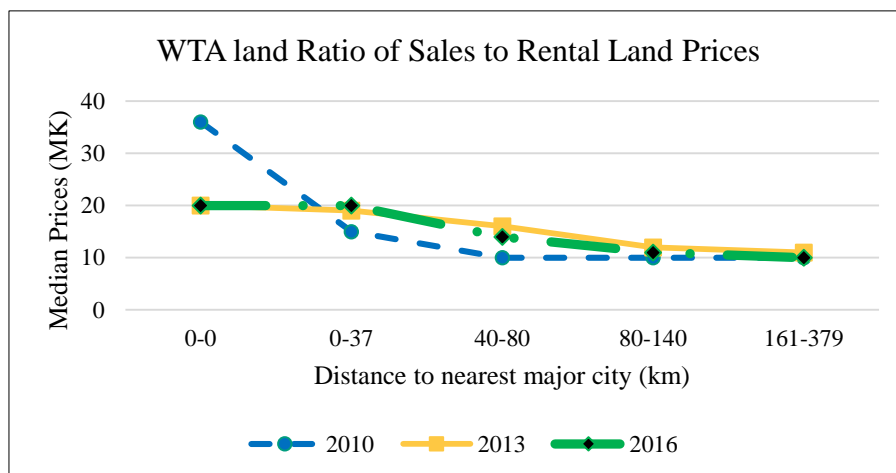
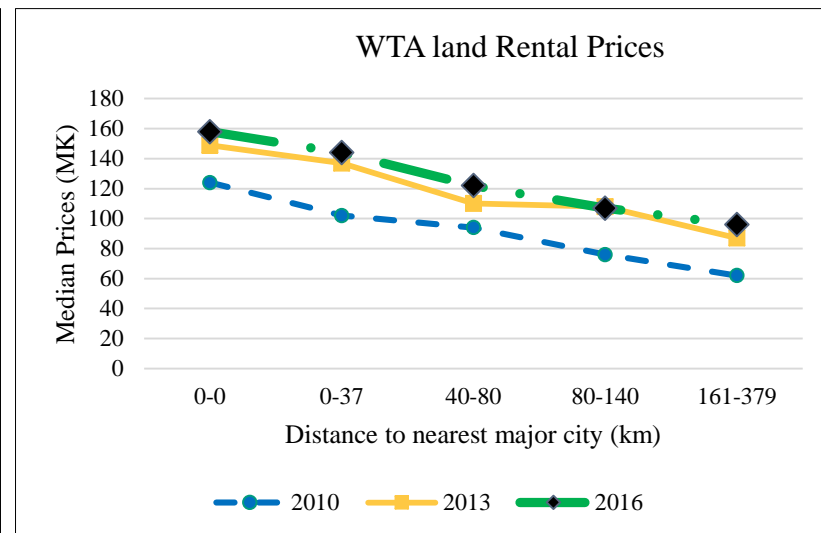
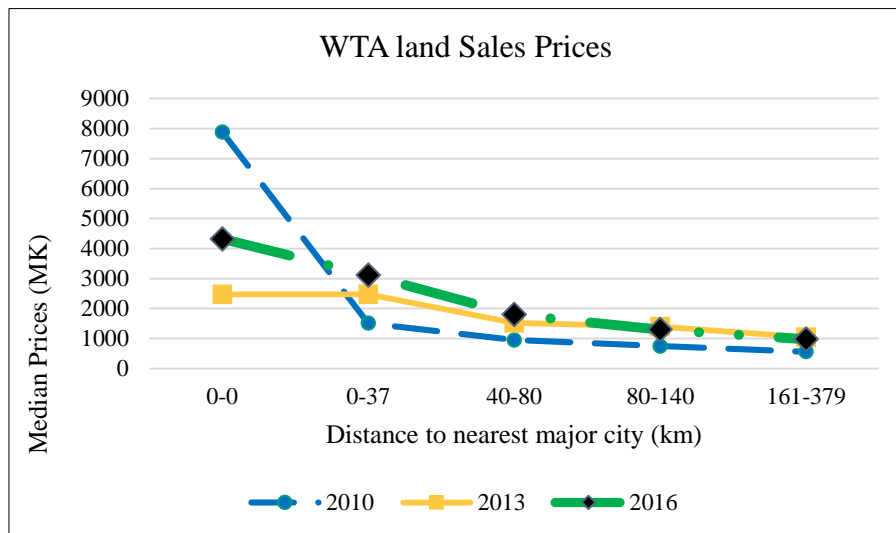
- 3 equations
  - Sales prices
  - Rent out prices
  - Ratio of sales/rent prices

# Estimation method



- Key variables
  - Household size to land ratio (number of person/ha)
  - Time dummy
- Control variables
  - Parcel area
  - Soil type
  - Sex, age and education of HH head
  - One lagged drought/irregular rain experience
  - Distance to weekly market
  - Distance to baseline house location
  - Total livestock units and one year lagged TLU

# Descriptive statistics



- Prices decrease with distance from the city
- Focus is from peri-urban to rural areas

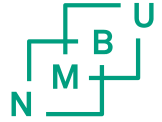
# Results and discussion

# Results – Sales Model



Variable (2010 base year)	EA and distance quintiles					
Number of EA	1 - 22	23 - 42	43 - 62	63 - 82	83 - 102	
Distant range to the city (km)	0-0 km	0-37 km	40-80 km	80-140 km	161-379 km	
Sales model						
Household size to land ratio	0.008****	0.008**	0.009***	0.003*	0.005****	
(Number of persons per ha)	(0.0009)	(0.0029)	(0.0028)	(0.0019)	(0.0010)	
2013 year	-0.292	0.390****	0.347***	0.634****	0.346***	
	(0.2913)	(0.0860)	(0.1077)	(0.0907)	(0.1043)	
2016 year	-0.047	0.730****	0.453****	0.495****	0.433****	
	(0.2535)	(0.0774)	(0.0976)	(0.1029)	(0.0940)	
Other Controls	Yes	Yes	Yes	Yes	Yes	
Constant	8.610****	7.860****	7.888****	7.750****	6.772****	
	(0.5892)	(0.2559)	(0.1668)	(0.4223)	(0.1239)	
Observations	388	1,070	1,847	1,600	1,574	
R-squared	0.218	0.125	0.159	0.128	0.158	
Number of EA id	22	20	20	20	20	
Calculated change: 2013 to 2016	0.245	0.340***	0.106	-0.139	0.087	
	(0.3862)	(0.1157)	(0.1454)	(0.1372)	(0.1404)	

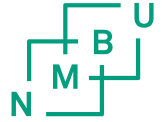
# Results and discussion



## Hypothesis 1:

- A unit increase in farm level population pressure (number of persons per ha) increases shadow land prices from between 0.3 to 0.9% across quintiles
- Cannot reject H1
- With population pressure, this could imply importance of own staple food (maize) production for food security in both peri-urban and rural areas in Malawi

# Results and discussion



## Hypothesis 2:

- Between 2010 and 2013, sales price increase was higher at distance above 80 km from city zone or rural areas
- With increased demand for land during the associated “land grab” period, this could have penetrated among smallholder agricultural sector in rural areas of Malawi
- Cannot reject H2

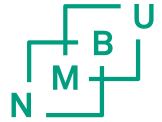


# Results – rental Model



Variable (2010 base year)	EA and distance quintiles					
Number of EA	1 - 22	23 - 42	43 - 62	63 - 82	83 - 102	
Distant range to the city (km)	0-0 km	0-37 km	40-80 km	80-140 km	161-379 km	
Rental model						
Household size to land ratio	0.009****	0.006**	0.008****	0.005****	0.004***	
(Number of persons per ha)	(0.0015)	(0.0026)	(0.0014)	(0.0010)	(0.0012)	
2013 year	0.151	0.103	0.084	0.339***	0.271***	
	(0.1091)	(0.0991)	(0.0751)	(0.1001)	(0.0895)	
2016 year	0.110	0.266**	0.298****	0.455****	0.450****	
	(0.1410)	(0.0953)	(0.0684)	(0.0890)	(0.0637)	
Other Controls	Yes	Yes	Yes	Yes	Yes	
Constant	5.082****	5.640****	5.668****	5.478****	4.773****	
	(0.2707)	(0.1613)	(0.0967)	(0.1806)	(0.1617)	
Observations	389	1,076	1,847	1,602	1,575	
R-squared	0.303	0.201	0.249	0.237	0.234	
Number of EA id	22	20	20	20	20	
Calculated change: 2013 to 2016	-0.041	0.157	0.214**	0.116	0.179	
	(0.1782)	(0.1375)	(0.1056)	(0.1339)	(0.1099)	

# Results and discussion



## Hypothesis 3:

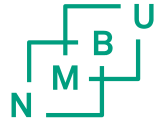
- Between 2013 and 2016,
  - Sales prices have remained fairly stable or slightly decline in rural areas
  - Rental prices have increased in all areas
- We reject H3
- Despite constrained supply response in SSA, other upward push factors still affect land prices
  - One of which is the farm level population pressure

# Results – Ratio Model



Variable (2010 base year)	EA and distance quintiles				
Number of EA	1 - 22	23 - 42	43 - 62	63 - 82	83 - 102
Distant range to the city (km)	0-0 km	0-37 km	40-80 km	80-140 km	161-379 km
<b>Land sales/rental price ratio model</b>					
Household size to land ratio	-0.000	0.001	0.002*	-0.001	0.001***
(Number of persons per ha)	(0.0008)	(0.0008)	(0.0011)	(0.0008)	(0.0003)
2013 year	-0.314	0.318***	0.305***	0.315***	0.086
	(0.3027)	(0.0828)	(0.0850)	(0.1072)	(0.1214)
2016 year	-0.045	0.406****	0.197*	0.066	0.022
	(0.2699)	(0.1016)	(0.1055)	(0.1037)	(0.0862)
Other Controls	Yes	Yes	Yes	Yes	Yes
Constant	3.990****	2.995****	2.909****	3.114****	2.709****
	(0.5567)	(0.1697)	(0.1439)	(0.2942)	(0.1045)
Observations	388	1,062	1,841	1,587	1,565
R-squared	0.081	0.052	0.048	0.030	0.039
Number of EA id	22	20	20	20	20
Calculated change: 2013 to 2016	0.269	0.088	-0.108	-0.249*	-0.640
	(0.4056)	(0.1311)	(0.1355)	(0.1491)	(0.1489)

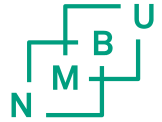
# Results and discussion



## Hypothesis 4:

- Between 2010 and 2013,
  - Increase in ratio of prices expanded further into rural areas but partly reversed in 2016
- Cannot reject H4
- Ratio changes could be from changing land use from agricultural to non-agricultural purposes or new investments in agriculture for urban farming.

# Conclusion



- While the SSA policy focus in the past decade has been on large scale land transfers, the study shows that
  - Population growth and urbanisation also affected shadow land prices among smallholder farmer in Malawi
- Thus, the rural and urban development policies in Malawi should incorporate land markets, with
  - Consideration of whether land markets can be an affordable avenue for accessing land
  - Mainly for land scarce households and youth

# Acknowledgements

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THANK YOU FOR YOUR  
ATTENTION