

Tenure Insecurity, Gender, Low-cost Land Certification, and Land Rental Market Participation

By

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Background

- This ongoing research is based on ten years of collaboration between Norwegian University of Life Sciences and Mekelle University in Tigray, Ethiopia.
- Collaboration with the World Bank on this research started in 2005.
- Panel Data Collection: Funding from Research Council of Norway, Norwegian Ministry of Foreign Affairs, NORAD, and the Norwegian Trust Fund (project with Klaus Deininger).
- Here I present one out of three joint papers on impacts of land certification in Tigray.

Introduction

- New land reforms high on the development agenda:
 - Commission on Legal Empowerment of the Poor
 - The World Bank
 - UNHABITAT (Global Land Tools Network)
- Emphasis on formalisation of land rights
- Pro-poor reforms
- Enhancing tenure security
- Enhancing allocative efficiency and investment
- Enhancing women's land rights
- Reducing land-related disputes

Roles of land rental markets

- Reallocate land to more efficient producers when markets for non-land resources are missing or imperfect
- Provide access to land for land-poor and landless households at low financial cost
- Provide rental income or farm output for households who lack resources to farm their land efficiently themselves
- How efficient are land rental markets as compared to other factor markets as instrument to readjust factor ratios?

Transaction costs and allocative efficiency of land rental markets

- Bliss and Stern (1982) model

Rented land as a function of desired cultivate area and own land holding: Simple OLS

$$L_j = f(h(\bar{N}) - \bar{L}) = a_0 + f' h_N \bar{N} - f' \bar{L} = a_0 + a_1 \bar{N} + a_2 \bar{L}$$

Expanded by Skoufias (1995)

tobit model approach

Weaknesses of earlier studies

- Used only cross-section data
- Could not test the dynamic response
 - Could not control for unobserved heterogeneity of households and farms
- Did not test for the functional form of transaction costs
- Did not test for selection bias and the appropriateness of the censored tobit model

Policy-related questions

- Can land rental markets compensate for imperfections in non-land factor markets?
- Can land rental markets contribute to poverty-reduction?
- Can land rental markets be a more efficient way of reallocating land resources than land redistributions?
- Can land certification enhance tenure security and indirectly enhance the efficiency of land rental markets?
- How can policies contribute to obtain the full potential of land rental markets?

Novelty of this paper

- Assesses the impacts of the low-cost certification on allocative efficiency of the land rental market
- Uses a unique household panel data set covering the situation immediately before and up to 8 years after the land reform
- Assesses dynamic adjustment and tests for state dependency using a new approach to dynamic non-linear panel data modeling due to Wooldridge (2005)
- Controls for endogeneity of certification by generating a random certificate variable that is used for impact assessment (new approach based on Holden et al. in press)
- The combination of methods controls for unobserved time-invariant heterogeneity of households, including time-invariant land quality

Land tenure in Ethiopia

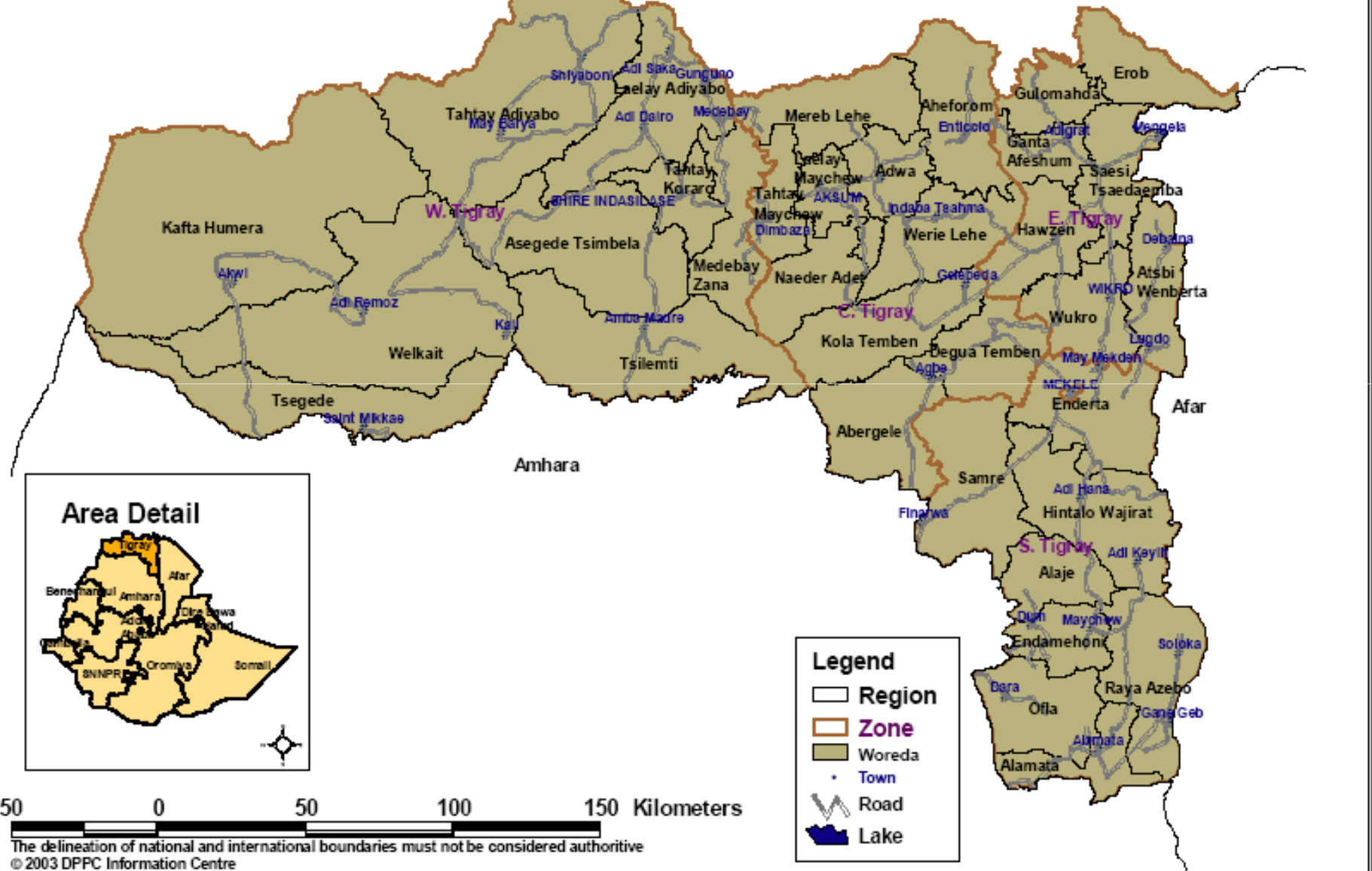
- All land is owned by the state (since 1975)
 - Land used as a safety net; all residents in a community had the right to get land for free, this was ensured through local land redistributions
 - Egalitarian land distribution based on household size
 - Each household got a share of each land quality class in the village
 - Land renting and hiring of labour was illegal
 - Redistributions created tenure insecurity
- Change in government in 1991
 - More market-friendly policy
 - Land is still owned by the state
- Land rights regulated by Federal and Regional Land Proclamations and Regional Land Regulations

Active land rental markets in Ethiopia

- Dominated by sharecropping contracts
- Landlords usually poorer than tenants
- Female-headed households often rent out their land
 - Cultural taboos against women ploughing with oxen
 - No rental market for oxen ploughing
- Certificates may strengthen female-headed households' tenure security and their bargaining power in the rental market



Tigray Region Administrative Boundaries



50 0 50 100 150 Kilometers

The delineation of national and international boundaries must not be considered authoritative
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Legend

- Region
- Zone
- Woreda
- Town
- ~ Road
- ~ Lake

Land certificates in Tigray



- Simple one-page certificates
 - Name of head of hh (husband not wife usually)
 - Name of location, plotsize, land quality of plots, and names of neighbours

Theoretical models

- Landlord models
 - Capture gender-specific tenure insecurity, endowment effects, and land certification impacts
 - with transaction costs affected by earlier market participation (trust and reputation), and unobservable and observable landlord characteristics
- Tenant models
 - Access may be constrained and depend on earlier market participation (trust, reputation), land reform, observable and unobservable tenant characteristics
- Policy effects tend to be dynamic and may depend on past and initial conditions

Landlord model

- Bellman equation

$$V(A_t) = \underset{R,L}{\text{Max}} U \left[\left\{ \begin{array}{l} pq(A-R, L, N(g)) + p(1-\alpha)q(R) \\ -c(R, R_{t-1}) - wL \end{array} \right\} + \beta V\{A - \xi(C, g)R\} \right]$$

- Gender and LRM participation:

$$R_g = |H|^{-1} \left\{ \begin{array}{l} U_Y pq_{AN} N_g - U_{YY} pq_N N_g (p(1-\alpha) - pq_A - c_R) - \beta (V_{A_{t+1}, A_{t+1}} R - V_{A_{t+1}}) \xi_g U_Y pq_{LL} \\ -(U_Y)^2 p^2 q_{LN} q_{AL} N_g \end{array} \right\}$$

- >0 if endowment effect dominates
- <0 if tenure insecurity effect dominates

Landlord model, cont.

- Effect of certification

$$R_C = |H|^{-1} \left\{ \beta (V_{At+1} - V_{At+1,At+1} R) \xi_C U_Y p q_{LL} \right\}$$

- Unambiguously positive if certification enhances tenure security
- Will *ceteris paribus* be stronger for female-headed households if the tenure security effect is stronger for them

Some key hypotheses

- H1. Female-headed households are more likely to rent out land and rent out more land than male-headed households (due to their poverty in non-tradable non-land resources) vs.
- H2. Female-headed households rent out less land than male-headed households because they are more tenure insecure.
- H3. Landlords that received certificates rent out more land after the reform (due to increased tenure security).
- H4. Female landlords that received land certificates rent out more land as a response to getting land certificates compared to male landlords that received land certificates (because they initially were more tenure insecure and land certificates increased their tenure security relatively more).

Data

- Household panel data survey
 - Stratified random sample of 400 households in 16 communities
 - Stratification based on population density, market access and agroclimatic variation
 - Surveyed in 1998, 2001, 2003 and 2006
 - Household and farm plot level data
 - Use households for which we have complete data (balanced panel): 303 households included in final analysis

Methods

- Test and control for attrition bias
 - Deaton's (1997) approach
- Identification strategy for certification variable
 - Use a linear probability model with household fixed effects to clean out endogeneity bias due to observable and unobservable household and farm characteristics
 - Use the residual of this model as measure of random certification
 - A high (close to 1) value indicates a household with certificate and low probability of having one
 - A low (close to -1) value indicates a household without certificate and a high probability of having one

Methods

- Dynamic panel data models with binary (Probit) and censored (Tobit) response variables and include controls for unobserved heterogeneity
 - Random effects Probit form for the binary land rental market participation models
 - incorporated lagged dependent variables along with exogenous variables
 - unobserved heterogeneity is assumed to be additive inside the standard normal distribution function
 - unobserved effect is modelled on the initial condition and exogenous variables to get a likelihood function that does not depend on the unobserved individual effects (Wooldridge 2005)

$$P(y_{it} = 1 | y_{i,t-1}, \dots, y_{i0}, z_i, c_i) = \Phi(z_{it}\gamma + \rho y_{i,t-1} + c_i)$$

Methods, cont.

- The dynamic corner solution model with unobserved heterogenous effects for land rented in or rented out is modelled as a random effects tobit model;

$$y_{it} = \max \left[0, z_{it}\gamma + g(y_{i,t-1})\rho + c_i + u_{it} \right]$$

$$u_{it} \mid y_{i,t-1}, \dots, y_{i0}, z_i, c_i \sim \text{Normal}(0, \sigma_u^2)$$

Methods, cont.

- Unobserved heterogeneity is modeled on the initial conditions and the exogenous variables:

$$c_i = \alpha_0 + \alpha_1 y_{i0} + z_i \alpha_2 + \alpha_i$$

- The analysis requires balanced panel data

Panel probit models:

Determinants of participation in the land rental market

Variables	Landlord 1	Landlord 2	Tenant model
Landlord dummy, lagged one period	1.422**** (0.15)	1.421**** (0.15)	
Landlord dummy, initial year	0.588** (0.23)	0.605*** (0.22)	
Tenant dummy, lagged one period			1.089**** (0.16)
Tenant dummy, initial year			0.574* (0.29)
Random certificate, residual	0.047 (0.40)	0.066 (0.37)	
Years since certification	0.016 (0.02)	-0.002 (0.03)	0.048** (0.02)
Sex of household head	0.560**** (0.14)	0.566**** (0.15)	-1.045**** (0.25)
Sex of household head*Random certificate, residual	1.822* (0.95)	1.687* (0.93)	
Own farm size	0.031** (0.02)	0.031** (0.02)	0.013 (0.02)

Area rented out models with gender and certificate interaction variables

Variables	Area rented out 1	Area rented out 2	Area rented out 3	Area rented out 4
Lagged land area rented out	0.231** (0.10)	0.237** (0.11)	0.232** (0.10)	0.237** (0.11)
Land area rented out, initial year	0.542**** (0.15)	0.548**** (0.16)	0.551**** (0.15)	0.556**** (0.15)
Landlord dummy, lagged one period	3.008**** (0.34)	3.046**** (0.36)	3.028**** (0.36)	3.060**** (0.33)
Landlord dummy, initial year	-0.008 (0.42)	-0.035 (0.42)	0.043 (0.40)	0.02 (0.41)
Random certificate, residual from prediction	0.839 (0.70)	-0.213 (0.73)	0.913 (0.68)	-0.065 (0.75)
Years since certification	0.069** (0.03)	0.071** (0.03)	-0.021 (0.05)	-0.011 (0.04)
Sex of household head	1.471**** (0.26)	1.411**** (0.26)	1.475**** (0.24)	1.414**** (0.24)
Sex of household head*Random certificate, residual		4.264** (1.71)		3.874** (1.61)
Predicted certificate, control for unobserved household heterogeneity			1.118**** (0.34)	1.025*** (0.36)
Own farm size	0.163*** (0.05)	0.160*** (0.05)	0.166**** (0.05)	0.163*** (0.05)

Land area rented in models

Variables	Area rented in 1	Area rented in 2
Lagged land area rented in	0.302*** (0.11)	0.072 (0.14)
Initial year land area rented in	1.104**** (0.24)	0.118 (0.36)
Tenant dummy, lagged one period		2.346**** (0.41)
Tenant dummy, initial year		1.590* (0.85)
Years since certification	0.203**** (0.04)	0.138**** (0.04)
Sex of household head	-3.555**** (0.66)	-3.319**** (0.63)
Own farm size	0.066 (0.05)	0.085* (0.05)

Conclusions

- Significant and positive effect of land certification on the amount of activity in the land rental market
 - (Potential) female landlords more willing to rent out their land
 - Easier for (potential) tenants to access land to rent in
- Significant state dependency in the land rental market
 - This may indicate non-convex transaction costs in the land rental market (entry barrier)
 - These transaction costs remain high after the reform and policies should aim to further reduce these

Conclusion: Wider perspective

- Why the Ethiopian reform with more restricted rights has been successful while land titling programs in Kenya and Madagascar did not have similar effects:
 - Collateral effect unimportant in all cases
 - Initial tenure insecurity higher in Ethiopia – created a demand for certificates
 - Low cost and rapid implementation through a participatory and transparent process
 - Local administrative capacity and motivation
 - No local elite was threatened by the reform