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Abstract

This study investigates attitudes towards legalizing land sales and Willingness to Accept (WTA) sales prices and compensation prices for land among smallholder households in four different areas in the Oromia and SNNP Regions in the southern highlands of Ethiopia. Household panel data from 2007 and 2012 are used. The large majority of the sample prefers land sales to remain illegal, and the resistance to legalizing land sales increased from 2007 to 2012. In the same period, perceived median real land values increased sharply but also exhibit substantial local variation. Land loss aversion is associated with higher land values and less willingness to sell land if land sales were to become legal. The substantial increase in perceived land values, high economic growth and outmigration of youth have yet to persuade the rural population in southern Ethiopia to open the land sales market.

Key words: land sale, land values, compensation values, household perceptions, Southern Ethiopia.

JEL codes: P26; Q15; Q24.

1. Introduction

With the sharp increase in demand for land, following the global food, energy and financial crisis that developed in 2007-2008, land sales markets in Africa rapidly captured global attention (Deininger and Byerlee 2011; Cotula 2009). Should Africa make its abundant land resources available for international investors or should African countries continue to restrict such access and reserve the land for the local poor to grow their own food? There is a fear that large land deals are a threat to the food security of the poor and vulnerable, while such deals may also be an opportunity for Africa to develop its agricultural sector and produce food and energy crops for export (Cotula 2009). Ethiopia is one of the countries that have received attention as sources of land for international investors, while land access is increasingly difficult for rural households in the densely populated highlands of Ethiopia, where land sales are strictly prohibited and smallholders only are allowed to rent out part of their land for brief periods. What are the local

smallholders' perceptions of land sales and how do they value their land? Land sales have been prohibited in Ethiopia since the radical land reform in 1975, and the restricted land use rights resemble those of agricultural households in China and Vietnam.

We examine factors associated with smallholder households potentially willing to sell their land and for those willing to sell, the factors that affect or are correlated with their stated Willingness to Accept (WTA) selling prices in Ethiopia. The country has undertaken new land reforms since the late 1990s that include strengthening individual land rights and allowing land renting, while land sales and mortgaging land remain illegal. One might believe that the next natural step after strengthening individual land rights through land registration and certification would be to allow land sales given the continued population growth and declining farm sizes on one side and strong economic growth with new employment opportunities outside agriculture on the other. Allowing land sales could enable farmers to exit agriculture and use the capital from the sale of their farms to begin a new livelihood somewhere else. We use household panel data from 2007 and 2012 in Southern Ethiopia, where outmigration has expanded and most households had received land certificates by 2007 (Bezu and Holden 2014a, b).

We explore the attitudes among rural households towards allowing land sales in a society in which land has represented the safety net and access to land has been a constitutional right for all since the radical land reform in 1975. Recent development has made it impossible to continue to provide this constitutional right, and land's function as a safety net is fast eroding due to rapid population growth and land fragmentation. Youth are increasingly landless, and non-farm employment opportunities are increasingly necessary (Bezu and Holden 2014a). A high level of economic growth contributes to facilitating this transformation, and an important policy question concerns whether the prohibition of land sales is beneficial for development and the poor or ties them to the land and makes their transition more difficult. Possible reasons for continued prohibition include: a) land is formally owned by the state; b) there is a fear that permitting land sales will lead to distressed land sales and the migration of desperate individuals to the towns and cities where slums will develop and social problems will be exacerbated; and c) the removal of the prohibition will lead to a return of a more in-egalitarian land distribution and the poor will suffer. While this is a large and complex question, we explore the changes in rural household attitudes and perceptions from 2007 to 2012 regarding the continuation of the prohibition of land sales.

Land issues are politically sensitive in Ethiopia and have been at the heart of political conflicts and reforms. The recent successful land registration and certification reform (Deininger et al. 2008; 2011; Holden et al. 2009; 2011), however, appears to have made land a less sensitive topic and subject to more open discussions. This is, to our knowledge, the first study that asks direct questions concerning attitudes towards land sales and willingness to accept prices if land sales were to be made legal in Ethiopia. We anticipated that asking about land sales would trigger protest responses or reluctance to answer because land sales are illegal. We therefore also investigated the land valuation question from another perspective to determine whether this

would generate fewer protest responses among the responding households. We asked households what they perceived as a minimum acceptable compensation payment in the event that their farms were to be expropriated for public purposes. Such expropriations are occurring and may be less controversial than asking for a selling price for land. By assessing the difference in responses to these two approaches, our aim is to obtain a better understanding of the resistance to land sales and how individuals actually value the land to which they have perpetual user rights. We assess these by: a) comparing mean WTA selling and compensation prices, b) assessing factors associated with willingness to state such prices, and c) comparing the distributions of land sales and compensation prices and how these have changed from 2007 to 2012.

2. Conceptual framework and hypotheses

Hernando de Soto (2001) has argued that the formalization of land rights is essential to achieve economic development and is the basis for establishing land markets that are linked to financial markets that can make the "dead capital of the poor alive". The credit and land sales link is also one of the three pillars in the neoclassical theory of land rights for the promotion of investment, economic growth and development. However, the recent financial crisis has also demonstrated that the link between property rights and financial markets can also represent the Achilles' heel of the economy, creating larger fluctuations and less economic stability unless careful regulation of financial markets is ensured.

There are several reasons for resisting the legalization of land sales. A common fear has been that the land sales market leads to a more skewed land distribution due to distress sales by the poor, who lose their land at times when they occupy a weak bargaining position and therefore obtain a poor price (Holden, Otsuka and Place 2008). This could be related to covariate shocks in agriculture or economic crises or recessions when indebted landowners may be forced to sell their properties. The land sales market is not a level playing field but is often subject to political control by the elite, and land sales may not transfer land to more efficient land users (Binswanger, Deininger and Feder 1995). In-egalitarian land distributions may also be associated with inefficiencies in rural economies and weak economic growth (Binswanger and Deininger 1997). This also implies that land values are separated from agricultural land productivity where land sales markets are legal. This separation is obvious in areas experiencing urban expansion, where land values tend to increase sharply and are substantially above the agricultural value. However, land values are also often higher in rural areas because of policies that may favor the elite such as land investment representing a tax shelter or the provision of credit subsidies to large landowners. Expectations of a future increase in land values can also cause short-term land values to increase. All of these factors may imply that land sales do not necessarily lead to the transfer of land to more productive users, and small farmers may be rationed out of the land sales market despite that they may be more efficient than large landowners.

There are few good empirical studies of the effect of land sales on land distribution. Studies in Kenya and Uganda did not find that land sales resulted in more skewed land distributions in the 1990s (Holden, Otsuka and Place 2008).

Historically exploitative tenancy systems may be another reason for radical reforms and the prohibition of land sales in certain countries, such as in China, Vietnam and Ethiopia, where radical land reforms were implemented and created highly egalitarian land distributions intended to protect individuals from such exploitation (Holden, Otsuka and Deininger. 2013). However, this radical approach prevented the users of the land from owning it themselves, and tenure insecurity emerged from land redistributions that were imposed to provide land to new households and maintain the egalitarian land distribution (Deininger and Jin 2006; 2008; Holden and Yohannes 2002).

High dependence on agricultural land for livelihood can be another reason for resistance to land sales. If the household perceives no or highly uncertain alternative livelihood options, risk aversion contribute to explaining such resistance. Economic development and the diversification of the economy should reduce the dependence on agriculture for livelihood and reduce resistance to land sales. Households and persons who perceive investment opportunities outside agriculture may also believe that the land could be a source of capital for such investments in new livelihood opportunities outside agriculture.

Another potential theoretical explanation for resistance to land sales is the 'endowment effect' in relation to property ownership. This effect implies that individuals place a greater value on an entitlement that they have to relinquish than one they will acquire. The endowment effect was first documented by Knetsch (1989) and Kahneman et al. (1991) and implies that an agent prices a good more highly when he possesses it than otherwise. Agents in possession of a good or property, such as land, may then be willing to devote greater effort to retain their possession of this land than an equally strong agent who may desire the same land but does not initially possess it. One explanation for this endowment effect is loss aversion: the disutility of relinquishing something one owns is greater than the utility of acquiring it (Camerer, 2003; Gintis, 2009). However, recently, the endowment effect has been questioned, and a careful experimental design is required to ensure that such an effect is not due to the experimental design (Plott and Zeiler, 2005, 2007) or simple credit constraints and diminishing utility (Holden and Lunduka, 2011).

Repeated redistributions of land to ensure equitable access to land for all households and prohibiting the sale and mortgaging of land since 1975 contributed to individual households' land rights remaining weak and insecure (Rahmato, 1984; Holden and Yohannes, 2002; Deininger and Jin, 2006). The past land reform may therefore have reduced the endowment effect in Ethiopia, and the more recent land registration and certification reform with simultaneous provision of more secure legal rights, in combination with joint Certification of husbands and wives, may provide husbands with a sufficient positive endowment effect to compensate for their sharing the land rights more evenly within the household. This is an issue for empirical investigation in our research.

Based on this brief literature review, we seek to test the following hypotheses:

1. Economic development with strengthened individual land rights makes individuals more interested in allowing land sales
2. Land loss aversion is strong and causes resistance to permitting land sales
3. Land certification has contributed to increasing land values
4. Men are more willing to allow land sales than women (women may be more concerned with family food security through subsistence production)
5. Cash cropping is associated with greater interest in allowing land sales.

The findings regarding these hypotheses should be of substantial relevance for the future land policies in Ethiopia and possibly other countries where land sales have recently come into focus, especially related to large land deals and permitting the involvement of international investors through long-term land leases or sales. Ethiopia is one of the countries that permitted long-term leases for large areas of land, despite that land scarcity is an increasing problem in the Ethiopian highlands.

3. Methods

3.1. Survey areas and data

Four areas in the Oromia and SNNP regions of Ethiopia were selected for this study. The areas were chosen to capture important variations in farming systems and socio-cultural and economic conditions. Sashemene is a market center in Oromia Region where town development is associated with urban expansion and the transformation of rural land to urban land. Agriculture is primarily ox-plough based. Arsi Negelle is also located in Oromia Region and has good market access and relatively large farm sizes. Holden and Yohannes (2002) identified this area as having high tenure insecurity. Combine harvesters have recently been introduced in this area as an indicator of potentially important technological change. Wondo Genet in Sidama Zone in SNNP Region is a cash crop producing area with irrigation where sugar cane, chat and coffee are important cash crops but farm sizes are small. Wollaita in SNNP Region is a densely populated, subsistence-oriented perennial crop area more remotely located from markets. Poverty is severe, and youth outmigration has increased in recent years (Holden and Bezu 2014a). In Sashemene and Arsi Negelle, Oromo is the dominant ethnic group and most households are Muslims. The dominant ethnic group in Wondo Genet is the Sidama, while the dominant ethnic group in Wollaita is the Wollaita, and both of these groups are mostly Protestant.

The Oromia and SNNP regions each have their own land proclamations (OR 2002; 2007; SNNPR 2003; 2007), but these are consistent with the federal land proclamations (FRLAUP 1997; 2005). The regional land proclamations made the necessary preparations for joint land registration and the certification of husbands and wives to strengthen land rights in general and female land rights in particular (Holden and Bezu 2014b).

The survey instruments for 2007 and 2012 included a question posed to the head of the household concerning the minimum acceptable compensation value for the household's land if local authorities take it for public purposes. This was followed by a question concerning whether the household head would consider selling the land if it became legal to sell and a good price were offered. They could respond yes, no, or only if the household faced a desperate situation. This was followed by a question regarding what the minimum acceptable price would be were the household willing to sell the land now. Respondents were informed that the price should exclude the value of the house and other buildings on the land. A set of hypothetical questions was used to obtain a proxy for the head of the household's land loss aversion in the 2012 survey. The format of this instrument is included in the Appendix with selected survey instrument questions. This measure was ranked from 1 to 7, with 7 indicating the highest level of such land loss aversion. The motivation is that land loss aversion may explain an endowment effect for land, causing individuals to be reluctant to sell and only being willing to sell at a very high price (Camerer, 2003; Gintis, 2009). These questions were integrated into a survey instrument that collected detailed data on household characteristics, farm characteristics, and individual data from husbands and wives on perceptions, opinions, and knowledge of land law.

3.2. Estimation strategy

Household and individual panel data are generated as the basis for analyzing the willingness to answer the land value questions and factors associated with willingness to estimate land values. We first assessed the factors associated with willingness to offer a compensation value for land (equation 1), then the factors associated with being willing to sell land if doing so were legal (equation 2). The illegal nature of land sales may generate greater reluctance to respond to the land sale questions, and we therefore included two models to assess whether there are systematic differences in the responses and their correlates. The land sale willingness question also had three response options; see Appendix 1 for question formulations.

Willingness to give a compensation value:

$$1)\ P(C_{it}^{WTA>0}) = \Phi\left(c_0 + c_1 D_{it}^{LM} + c_2 M_v + c_3 F_v + c_4 D_t^{Year} + c_5 \lambda_i^L + c_6 X_{it} + c_7 \overline{X}_i + \varepsilon_{it}\right)$$

Willing to sell land if legal:

$$2)\ P(\mathrm{WTS}_{it}) = \Phi\left(c_0 + c_1 D_{it}^{LM} + c_2 M_v + c_3 F_v + c_4 D_t^{Year} + c_5 \lambda_i^L + c_6 X_{it} + c_7 \overline{X}_i + \varepsilon_{it}\right)$$

The same set of explanatory variables or correlates is used in the three models. D^{LM} denotes the two dummy variables for the male and female respondents being opposed to legalizing land sales. We assume that such resistance is associated with a lower likelihood of being willing to provide a compensation value or a sale value or being willing to sell land even if it became legal. We expect, however, the dummy for men to have a stronger effect than that of the women, as the husband generally responded to the compensation and willingness to sell questions in male-headed households. The M_v variable captures the village location in relation to markets and is

represented by a peri-urban dummy variable. The F_v variable represents different agricultural conditions captured by district dummy variables. The baseline district is Sashemene. λ^L is the household-level land loss aversion rank variable that may be associated with reduced willingness to sell land or provide a compensation value for land. X_{it} represents additional household and farm characteristics that are time varying and may affect willingness to provide a compensation value for land, (un-)willingness to sell land or propose a sale value for land. These variables include a polygamous household dummy variable, farm size per capita, border dispute experience (which may indicate tenure insecurity), the number of border witnesses (a tenure security indicator), a land certificate dummy, a dummy for household head's name as the only name on the land certificate, a dummy for participation in land reform meetings, a female head dummy, the age of the household head, total males in the household, and household size. $\overline{X}_i$ is the vector of means for time-varying household and farm characteristics that are used to control for time-invariant unobserved heterogeneity instead of household fixed effects, which cannot be applied in these probit models due to the incidental parameter problem (Mundlak-Chamberlain approach).

The minimum WTA selling prices for land for those willing to sell land if land sales were legal are regressed on the same set of variables as in the previous probit models, see equation 3, using truncated tobit models. We apply the same approach to the minimum compensation prices, equation 4). We include a variable for the share of households with land certificates in the community. If land certification has resulted in higher land values, a higher share of households with land certificates should be associated with higher land values in the community. We also include an interaction for year and location variables. We expect that land values have increased to greater extent in areas experiencing urban expansion (Sashemene and peri-urban areas). We expect poverty to be associated with lower land values, such as in the more remote Wollaita area, and to be higher in the cash cropping area with irrigation (Wondo Genet). We expect economic development and increasing population pressure to have contributed to increasing land values from 2007 to 2012 after controlling for inflation.

Minimum willingness to accept selling price for land per ha if legal:

3) $$\mathrm{WTA}_{it}^{LS} \mid_{WTA^{LS}>0} = a_0 + a_1 D_{it}^{LM} + a_2 M_v + a_3 F_v + a_4 D_t^{Year} + a_5 F_v * D_t^{Year} + a_6 \lambda_i^L + a_7 X_{it} + a_8 \overline{X}_i + a_9 IPW_i^{LS} + \xi_{it}$$

Minimum willingness to accept compensation price for land per ha:

4) $$\mathrm{WTA}_{it}^{C} \mid_{WTA^{c}>0} = \beta_0 + \beta_1 D_{it}^{LM} + \beta_2 M_v + \beta_3 F_v + \beta_4 D_t^{Year} + \beta_5 F_v * D_t^{Year} + \beta_6 \lambda_i^L + \beta_7 X_{it} + \beta_8 \overline{X}_i + \beta_9 IPW_i^{CV} + \upsilon_{it}$$

We expect that land loss aversion is positively associated with land values and relate this to an endowment effect and greater attachment to the land. We have no clear hypothesis regarding whether a preference for land sales being illegal is associated with higher or lower land values when such households were willing to report a minimum land value. Again, we apply the Mundlak-Chamberlain approach to control for time-invariant unobserved heterogeneity. This approach should also help to control for sample selection due to time-invariant unobservables. As

an additional control for sample selection, we include inverse probability weights (IPW) generated from the probit regressions for willingness to provide a selling price or compensation price. To obtain correct standard errors, we apply bootstrapping in the models with IPWs, resampling households. Cluster-robust standard errors are used in the other models, with clustering at the community level.

4. Descriptive statistics

Table 1 presents minimum median WTA compensation prices per ha and minimum median WTA selling prices for land for those willing to sell. The prices are in millions of inflation-adjusted Ethiopian Birr (EB), using June 2006 as the base. We observe a sharp increase in real WTA compensation and selling prices from 2007 to 2012, especially in Sashemene, which is a market center. The average changes in median compensation and sales prices are computed without compound interest over the five-year period. They illustrate the substantial variation across areas. The difference between Sashemene and Wondo Genet in the change over time is particularly striking and surprising. Figures 1 and 2 further illustrate the differences in WTA (log) selling prices across districts and years. Wondo Genet had higher prices than the other locations in 2007 but did not experience the same increase in land values as the other areas during the period 2007-2012. Figure 3 indicates that the distributions of minimum WTA selling prices and minimum WTA compensation prices are similar in both years. We observe a substantial increase in both types of prices from 2007 to 2012 after correcting for inflation.

Table 1. Land availability and land values per ha in 2007 and 2012 by district.

		2007		2012		% change/year	
District	Stats	Compen-sation value, mEB/ha	WTA sales price, mEB/ha	Compen-sation value, mEB/ha	WTA sales price, mEB/ha	Compen-sation value, mEB/ha	WTA sales price, mEB/ha
Sashemene	Median	.099	.098	.896	1.344	161	254
	N	73	120	62	53		
Arsi Negelle	Median	.105	.115	.448	.739	65	109
	N	64	103	55	20		
Wondo Genet	Median	.454	.454	.800	.605	15	7
	N	55	55	93	50		
Wollaita	Median	.073	.073	.269	.448	54	103
	N	146	146	176	138		
Total	Median	.106	.106	.448	.672	65	107
	N	338	424	386	261		

Note: Land values are in 2006 EB. The exchange rate was 8.4 EB/US$ in June 2006. mEB=million Ethiopian Birr. The % change per year in minimum median WTA compensation prices and WTA sales prices is the average change per year from 2007 to 2012 without compounding.

We may wonder how large these land values are compared to the official compensation rates offered in Ethiopia and to land values in other countries where land markets are operating. The following back-of-the-envelope calculation of the compensation value should correspond to the crop output value of a normal crop for seven years based on the compensation rules that were introduced in 2006. If we assume that the crop is teff, having an average yield of 1300 kg/ha, and the price of teff in 2006 is 6.4 EB/kg, we obtain a compensation value of 0.058 mEB/ha , which is substantially below the reported land values, even in Wollaita, in 2007. This official compensation value is approximately 6933 US$/ha. The median compensation values that farmers demanded according to the table above ranged from 8690 to 54048 US$/ha in 2007 and from 53333 to 160000 US$/ha in 2012 (in 2006 dollars).

A study that assesses land valuation and land compensation practices in Ethiopia (ELAP 2012) using a sample of 352 households whose land was expropriated (in the Amhara, Tigray, Oromia and SNNP regions), found that 272 households had been compensated and the remaining 80 had not. Of those compensated, 247 were compensated in cash, 17 compensated with substitute land and 8 compensated with land and cash. One of the reasons for not compensating households even after their land has already been taken is the disagreement with the compensation price. It is reported as a main reason by 60% of households not compensated in SNNP and 36% in Oromia. More than 90% of the interviewed compensated households reported that they were not satisfied with the compensation they received. Of those who were compensated, only 8% in SNNP and 3% in Oromia reported that they were satisfied with the compensation. Average compensation paid in cash in mEB/ha were 0.183 (Amara), 0.015 (Oromia), 0.011 (SNNP) and 0.014 (Tigray), with an overall average of 0.060. These are very low values compared to the expected minimum selling and compensation values in our study.

De Groote (2014) reported land values in the range of 800 to 3000 US$/ha in Kenya, well below the abovementioned Ethiopian values. With an average maize yield of 1500 kg/ha, the value of the crop is estimated at 375 US$/ha, with a range of 250 - 625 US$/ha. Our study area in Ethiopia is in the high potential southern highlands, and irrigated cash crops can yield high returns. We observe, however, that the largest increase in land values was recorded in the rain-fed area experiencing urban expansion (Sashemene). Clearly, factors other than agricultural land productivity are driving these increases WTA land valuations.

Table 2 provides an overview by district and year of the share of husbands and wives preferring that land sales remain illegal. Surprisingly, we observe that the share of respondents opposed to legalizing land sales increased in all districts from 2007 to 2012 and the rates are similar for men and women.

Table 2. Share of respondents who think that land sales should be illegal, by gender, district and year

		2007		2012	
District		Wives	Husbands	Wives	Husbands
Sashemene	Share	.70	.61	.88	.90
	N	152	152	136	136
Arsi Negelle	Share	.86	.77	.93	.96
	N	153	153	143	143
Wondo Genet	Share	.75	.79	.83	.88
	N	114	114	141	141
Wollaita	Share	.78	.80	.95	.90
	N	205	205	205	205
Total	Share	.77	.74	.90	.91

Source: Own survey data.

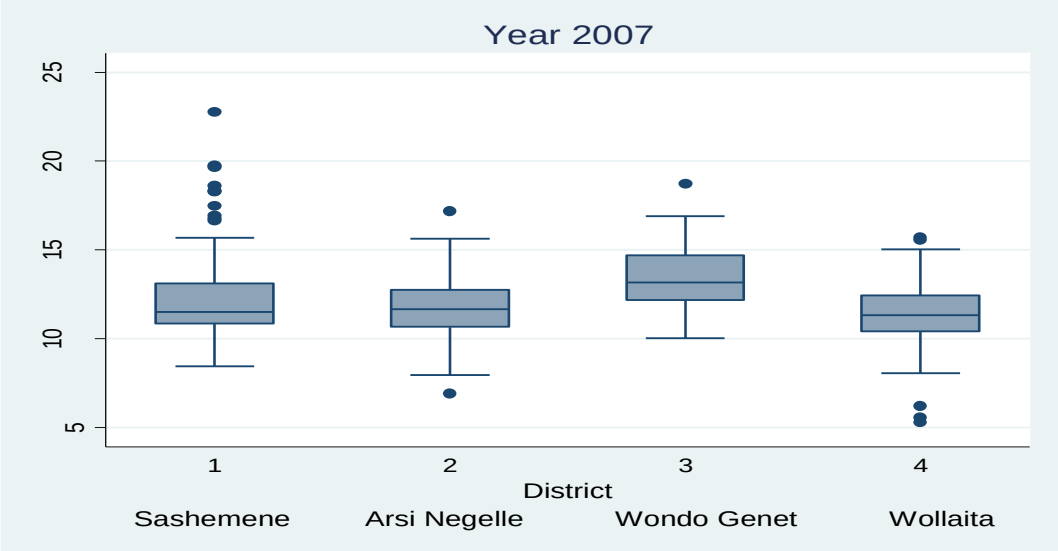

Figure 1. Land sale value distributions (log-transformed) by district in 2007

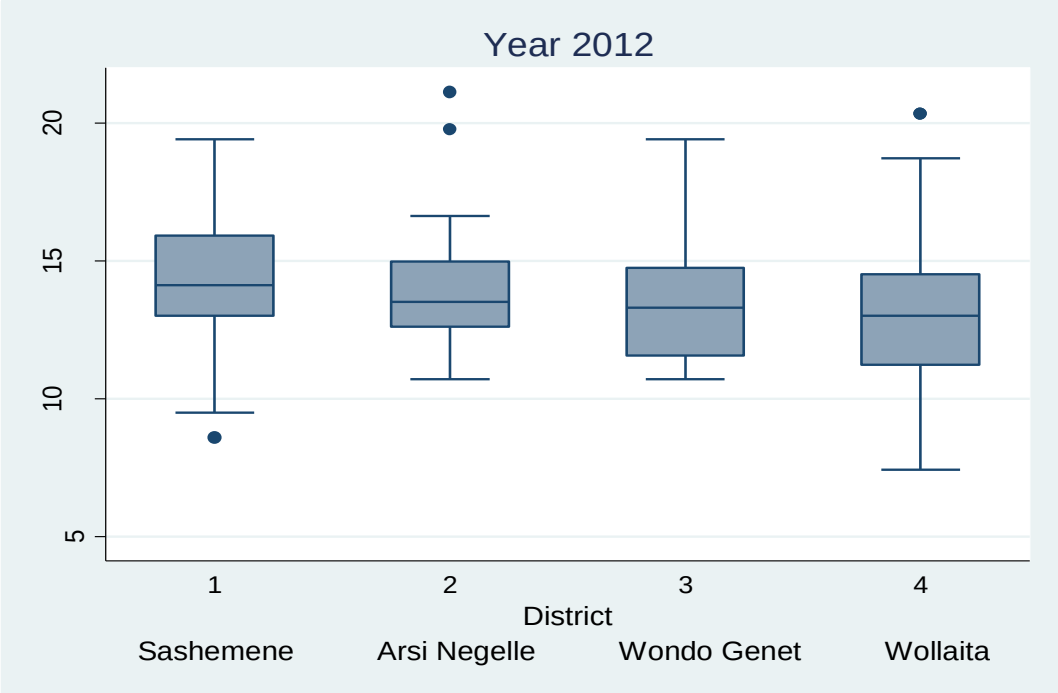

Figure 2. Land sale value distributions (log-transformed) by district in 2012

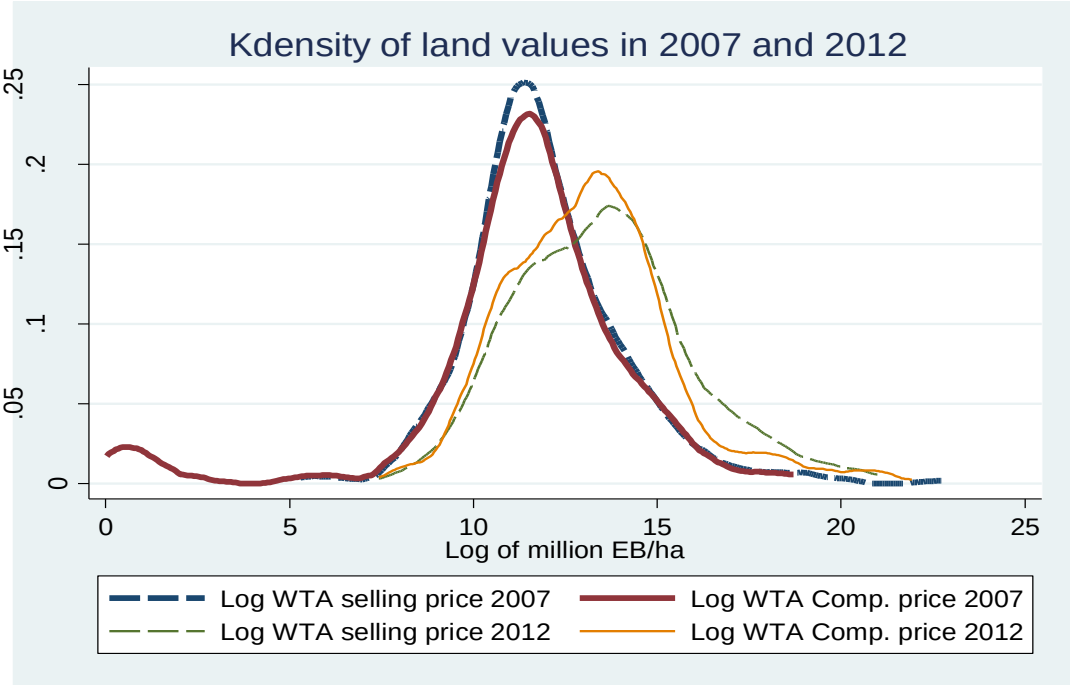

Figure 3. Real WTA selling prices and WTA compensation prices for land per ha in 2007 and 2012.

Table 3 presents an overview of the means of other relevant variables by district. The table includes a dummy variable for whether a household experienced land border disputes in the past, an indicator of tenure insecurity, and whether households believe they have a sufficient number of witnesses who can confirm the boundaries of their land, an indicator of the quality of the land registration process and of tenure security related to encroachment by neighbors.

Table 3. Means by district for key variables

	Sashemene		Arsi Negelle		Wondo Genet		Wollaita	
	Mean	N	Mean	N	Mean	N	Mean	N
Border dispute experience, dummy	.242	281	.257	292	.294	180	.273	396
Border witnesses for land, number	.875	281	.850	294	.937	190	.860	400
Has land certificate	.802	283	.867	293	.263	224	.771	397
Husband's name on certificate only	.153	288	.095	296	.018	255	.088	410
Participated in land reform meetings	.787	287	.799	294	.655	194	.725	400
Peri-urban dummy	.403	288	.243	296	.757	255	0	410
Polygamous hh, dummy	.229	288	.199	296	.121	248	.115	410
Female headed hh, dummy	.092	283	.153	288	.108	232	.131	406
Age of household head	44.3	288	45.8	296	54.9	255	48.0	410
Total males in household	3.68	284	3.77	287	3.97	237	3.48	406
Household size	7.24	284	7.31	287	6.62	239	6.68	407
Land loss aversion rank	3.55	201	3.52	243	5.66	176	.91	381

Note: The table gives the means for 2007 and 2012.

We observe that approximately one-quarter of households experienced land border disputes. Holden and Tefera (2008) found such disputes to have been very common before land registration and certification but that, through improved border demarcation, the reform contributed to reducing the number of such disputes. Up to 15% of households continue to report that they lack sufficient witnesses to confirm their plot borders. Whether households have a land certificate and whether only the name of the husband appears on the land certificate are represented by two dummy variables. Wondo Genet has the lowest share with land certificates. This district is a pilot district where modern tools for land registration and certification have been employed, and this is one reason for the delay in the distribution of certificates there. The large majority of households with land certificates have received a joint certificate. Certain husbands only have their own names listed on the certificates, with the highest share (15.3%) of such households being located in Shashemene. Another dummy variable identifies whether someone from the household participated in land reform meetings regarding the land registration and certification process. In this case Wondo Genet, where more modern tools were employed, also had the lowest participation share. Certain communities are identified as peri-urban and exposed to urban expansion using a separate dummy variable. We observe that more households in Sashemene are located in such areas, while none of the households in Wollaita fall under this category. The highest share of polygamous households is observed in Sashemene and Arsi

Negelle, where Muslims dominate, but polygamy is also common in Wondo Genet and Wollaita, where Protestants dominate. Female-headed households constitute between 9 and 15% of the sample in the four areas. The means of the household composition variables and age of the household head do not exhibit substantial variation across districts. Regarding the final variable, land loss aversion ranking, the average was substantially higher in Wondo Genet and substantially lower in Wollaita than in the other two districts. This may be related to the cultivation of cash crops and access to irrigation in Wondo Genet and the substantial outmigration of youth that recently occurred in Wollaita.

5. Results and discussion

5.1. Probit models for land valuation and land sale willingness

The first model in Table 4 provides the marginal effects estimates for the willingness to report a compensation value for land if it is taken for public purposes. Households in which the husband and wife are opposed to legalizing land sales are less likely to be willing to provide a minimum compensation value for land. The two variables are significant at the 5 and 10% levels. Older household heads are less likely to be willing to provide a compensation value (significant at the 5% level). Households in Wondo Genet (a cash-cropping area) and Wollaita (a remote and poor area) are more likely to be willing to provide compensation value for their land than households in Sashemene (the baseline district), and these differences were highly significant (at the 0.1% level). Households in peri-urban areas were significantly less likely to be willing to provide a compensation value (also significant at the 0.1% level). During the period 2007-2012, households in Sashemene were exposed to such land takings, and the responses to our survey might have been a protest reaction to such land takings in these areas. The land certificate variables and participation in land reform meetings were not significantly associated with willingness to provide a compensation price for the land.

The second model in Table 4 assesses willingness to sell land were this to become legal and an acceptable price were offered. Households where husbands opposed to legalizing land sales are significantly (at the 5% level) less likely to be willing to sell land. Households with higher land loss aversion rankings are significantly (at the 10% level) less likely to be willing to sell land. Female-headed households are significantly (at the 5% level) less likely to be willing to sell land. Households in Wollaita and Wondo Genet are significantly (at the 0.1 and 5% levels, respectively) more likely to be willing to sell, and households in Arsi Negelle are significantly (at the 5% level) less likely to be willing to sell than households in Sashemene. Households in peri-urban locations are significantly (at only the 10% level) more likely to be willing to sell if land sales were to become legal. We return to discussing our hypotheses in relation to these findings after presenting the truncated tobit models for land sales and land compensation values.

Table 4. Probit models for willingness to provide compensation value for land (P(Comp. Value>0)) and for willingness to sell land if land sale were legal and an acceptable price were offered (P(WTSell if Legal)).

	P(Comp. Value>0)		P(WTSell if Legal)	
	dy/dx	P>z	dy/dx	P>z
Land loss aversion rank	-0.005	0.404	-0.010*	0.094
Polygamous hh, dummy	0.025	0.581	-0.048	0.221
Farm size per capita	-1.10e-06	0.934	0.00002	0.222
Border dispute experience, dummy	0.011	0.743	0.005	0.880
Border witnesses for land, number	-0.071	0.116	0.038	0.325
Wife prefers land sales to be illegal	-0.081*	0.062	-0.027	0.475
Husband prefers land sales to be illegal	-0.101**	0.023	-0.079**	0.021
Has land certificate	-0.021	0.748	-0.013	0.822
Husband's name on certificate only	0.061	0.259	0.049	0.266
Participated in land reform meetings	-0.001	0.987	0.015	0.626
Female headed hh, dummy	0.169	0.222	-0.227**	0.042
Age of household head	-0.002**	0.037	0.0002	0.793
Total males in household	-0.025	0.106	-0.008	0.581
Household size	0.004	0.559	-0.004	0.602
Peri-urban dummy	-0.148****	0.000	0.060*	0.100
Year dummy, 2012=1	0.034	0.321	-0.178	0.000
District dummy variables				
Arsi Negelle	-0.065	0.107	-0.103**	0.017
Wondo Genet	0.250****	0.000	0.135**	0.016
Wollaita	0.235****	0.000	0.131***	0.005
Constant	1.539****	0.000	-0.610*	0.059
Wald chi2(24)	162.54		108.85	
Prob > chi2	0.0000		0.0000	
Pseudo R2	0.1694		0.1286	
Log pseudolikelihood	-466.93623		-398.8	
Number of observations	864		864	

Note: Probit models showing marginal effects and P-values. Mundlak-Chamberlain approach is used to control for unobserved heterogeneity by including the household level means of time-varying variables (these are dropped from the table to save space). *Significance levels: *: 10%, **: 5%, ***: 1%, ****: 0.01%.*

5.2. Truncated tobit models for land sales and compensation values

Table 5 presents WTA land sales price models with and without interaction variables for districts and years, and the last model contains an additional control for sample selection in the form of the inverse probability weight obtained from the probit model for land sales.

Table 5. Factors associated with stated minimum real land sales values per ha

	Model S1		Model S2		Model S3	
	Elasticity	P>z	Elasticity	P>z	Elasticity	P>z
Land loss aversion rank	0.175*	0.092	0.203**	0.050	0.256**	0.037
Polygamous household, dummy	0.092**	0.021	0.087**	0.018	0.099**	0.028
Farm size per capita	0.049	0.775	0.048	0.780	0.011	0.953
Border dispute experience, dummy	-0.079*	0.081	-0.076*	0.093	-0.073	0.204
Border witnesses for land, number	-0.058	0.730	-0.105	0.513	-0.151	0.547
Wife prefers land sales to be illegal	-0.282	0.101	-0.282	0.101	-0.266	0.152
Husband prefers land sales to be illegal	0.344**	0.042	0.313*	0.056	0.374**	0.045
Has land certificate	0.106	0.479	0.127	0.346	0.121	0.498
Husband's name on certificate only	0.071**	0.019	0.067*	0.059	0.063*	0.079
Participated in land reform meetings	-0.042	0.800	-0.005	0.979	-0.025	0.879
Female headed household, dummy	-0.037	0.484	-0.043	0.429	-0.025	0.655
Age of household head	-0.449*	0.077	-0.490*	0.069	-0.525*	0.098
Total males in household	0.220	0.350	0.134	0.552	0.188	0.561
Household size	-0.292*	0.098	-0.214	0.167	-0.213	0.568
Share of households with certificate in community	1.161**	0.030	0.991	0.104	0.946	0.239
Average farm size in community	-0.658	0.141	-0.550	0.216	-0.523	0.306
Peri-urban dummy	0.051	0.422	0.036	0.632	0.012	0.884
Year dummy, 2012=1	0.823****	0.000	0.962****	0.000	1.086****	0.000
IPW Land sale					-0.217	0.405
District dummy variables, Sashemene=base						
Arsi Negelle	-0.010	0.878	-0.017	0.783	0.002	0.980
Wondo Genet	-0.002	0.975	0.128*	0.092	0.124	0.216
Wollaita	-0.476**	0.027	-0.383**	0.029	-0.410	0.102
District*Year=2012 Interactions						
Arsi Negelle 2012			0.009	0.735	0.026	0.483
Wondo Genet 2012			-0.144***	0.007	-0.160**	0.012
Wollaita 2012			-0.076	0.618	-0.117	0.422
Constant	12.35****	0.000	12.25****	0.000	12.43****	0.000
Sigma constant	2.023****	0.000	2.007****	0.000	2.004****	0.000
Log pseudolikelihood	-1066.0		-1062.0		-1061.3	
Number of observations	502		502		502	
Wald chi(29)					175.82	

Note: Truncated tobit models with Mundlak-Chamberlain approach (means of time-varying variables were included but are dropped from the table to save space). IPW Land sale is the inverse probability weight from the land sale probit model in Table 4. The table presents elasticities and P-values. Standard errors in Model S1 and S2 are cluster robust with clustering at community level. Standard errors in Model S3 are bootstrapped with resampling of households based on 400 replications. *Significance levels: *: 10%, **: 5%, ***: 1%, ****: 0.01%.*

The results indicate that husbands who prefer land sales to remain illegal value their land significantly (at the 5, 10 and 5% levels) more than husbands who accept land sales. Land loss aversion is also significantly positively associated with minimum land sale values (significant at

the 10 and 5% levels). Households for which only the husband's name is included on the land certificate also value their land significantly (at the 5, 10 and 10% levels) higher than other households. Polygamous households value their land significantly (at the 5% level in all models) higher than other households. The age of the household head is significant (at the 10% level in all models) and takes a negative sign, indicating that older individuals value their land less. The variable for the share of households in the community with a certificate is significant (at the 5% level) and takes positive sign in the first model but is insignificant in the other two models, offering a weak indication that land certification has contributed to higher land values. The year dummy variable is highly significant (at the 0.1% level in all models) and takes positive parameter values in both models, confirming the strong time trend in land values. Land values are significantly (at the 5% level) lower in Wollaita in two of the models and significantly higher in Wondo Genet in 2007 in the second model, in which land values are also significantly (at the 1 and 5% levels) lower in Wondo Genet in 2012 in the second and third models. This illustrates the substantially weaker price trend in this cash-cropping area. We also observe that polygamous households value their land more than other households (significant at the 5% level in both models) and a weak indication that tenure insecurity is associated with lower land values, as the border dispute variable is significant at the 10% level in the first model.

Table 6 presents the minimum acceptable WTA compensation values for land with and without the district and time dummy variable interactions, and the last model includes the additional control for sample selection in form of the inverse probability weight from the probit compensation model in Table 4. The time trend effect is also highly significant (at the 0.1% level) in these models, but none of the interaction variables are significant. Wollaita has significantly (at the 0.1, 0.1 and 5% levels) lower land compensation values than the other districts, while Wondo Genet has significantly higher compensation values in 2007 in the last model that includes interaction variables. Land availability (farm size per capita) is significantly (at the 10% level in the two first models) negatively related with compensation values for land, and household size is highly significantly (at the 0.1, 1 and 1% levels) negatively related to land values. These findings may indicate that land scarcity leads to higher land values but also that large household size may be associated with poverty and lower land values, as observed in Wollaita. The peri-urban dummy variable is significant (at the 5, 10 and 0.1% levels) and takes a negative sign. It is possible that households in peri-urban areas have experienced land expropriation and compensation cases in their neighborhoods and therefore have more realistic expectations. The polygamous household dummy is highly significant (at the 0.1, 1, and 0.1% levels) and positive, indicating that such households value their land more highly than other households. The dummy for only the husband's name being on the land certificate is significant (at the 5, 10 and 5% levels) and with a positive sign. This may be a reverse causality effect; husbands who valued their land more may have acted more strategically during the land certification process to ensure that they retained full control over the land by not allowing other household members'' names to appear on the certificate.

Table 6. Factors associated with minimum compensation values per ha for land

	Model C1		Model C2		Model C3	
	Elasticities	P>z	Elasticities	P>z	Elasticities	P>z
Land loss aversion rank	0.118	0.290	0.130	0.231	0.081	0.490
Polygamous hh, dummy	0.151****	0.000	0.153***	0.002	0.174****	0.001
Farm size per capita	-0.317*	0.071	-0.334*	0.083	-0.317	0.111
Border dispute experience, dummy	0.033	0.496	0.043	0.499	0.037	0.583
Border witnesses for land, number	-0.385	0.144	-0.413	0.199	-0.530*	0.075
Wife prefers land sales to be illegal	-0.234	0.315	-0.263	0.284	-0.438*	0.065
Husband prefers land sales to be illegal	0.154	0.574	0.170	0.445	0.004	0.985
Has land certificate	-0.201	0.389	-0.215	0.265	-0.270	0.162
Husband's name on certificate only	0.091**	0.019	0.099*	0.051	0.115**	0.011
Participated in land reform meetings	0.185	0.333	0.183	0.312	0.173	0.383
Female headed hh, dummy	-0.100	0.211	-0.084	0.398	-0.023	0.826
Age of household head	-0.288	0.407	-0.314	0.245	-0.667**	0.050
Total males in household	0.051	0.846	0.117	0.749	-0.119	0.754
Household size	-1.046****	0.000	-1.008***	0.004	-1.084***	0.002
Share of households with certificate in community	1.431	0.102	1.326	0.131	1.439	0.116
Average farm size in community	-0.291	0.507	-0.307	0.527	-0.462	0.332
Peri-urban dummy	-0.145**	0.027	-0.135*	0.092	-0.308****	0.001
Year dummy, 2012=1	1.220****	0.000	1.054****	0.001	1.163****	0.000
IPW compensation value					1.607****	0.000
District dummy variables, Sashemene=base						
Arsi Negelle	-0.028	0.681	-0.030	0.764	-0.070	0.485
Wondo Genet	0.193	0.176	0.202	0.376	0.393*	0.068
Wollaita	-0.808***	0.006	-0.957****	0.001	-0.712**	0.014
District*Year=2012 Interactions						
Arsi Negelle 2012			0.005	0.926	-0.018	0.744
Wondo Genet 2012			-0.016	0.916	-0.044	0.755
Wollaita 2012			0.165	0.311	0.152	0.363
Constant	13.49****	0.000	12.48****	0.000	11.97****	0.000
Sigma constant	2.438****	0.000	2.431****	0.000	2.407****	0.000
Log pseudolikelihood	-1275.2		-1273.6		-1268.1	
Wald chi2(29)	.		229.9		171.5	
Prob > Chi2	.		0.000		0.000	
Number of observations	552		552		552	

Note: Truncated tobit models with Mundlak-Chamberlain approach (means of time-varying variables were included but are dropped from the table to save space). IPW Compensation value is the inverse probability weight from the compensation probit model in Table 4. The table presents elasticities and P-values. Standard errors in Model C1 and C2 are cluster robust with clustering at community level. Standard errors in Model C3 are bootstrapped with resampling of households based on 400 replications. Significance levels: *: 10%, **: 5%, ***: 1%, ****: 0.01%.

5.3. Discussion of hypotheses

Our first hypothesis stated: "*Economic development with strengthened individual land rights makes individuals more interested in allowing land sales*". Our findings revealed that the resistance to legalizing land sales increased during the period from 2007 to 2012 after most households had received land certificates and the country experienced strong economic growth. Therefore, it appears that we must reject this hypothesis; at a minimum, additional time is necessary before such attitudes will change in Ethiopia. The country remains highly dependent on agriculture and land as a safety net, and the constitutional right to land appears to continue to play an important cultural role in the country.

The second hypothesis stated: "*Land loss aversion is strong and causes resistance to permitting land sales*". Our study revealed strong resistance to allowing land sales. We employed a hypothetical experiment to reveal such a preference indicator for households. This preference measure revealed substantial variation across communities, with the greatest land loss aversion detected in Wondo Genet (a cash-cropping area) and the lowest rankings observed in Wollaita (a traditional subsistence area). These findings were somewhat surprising but could be related to the fact that Wollaita has surpassed a threshold level of land pressure followed by youth outmigration, as they no longer perceive a future in agriculture there (Bezu and Holden 2014a). This may also have affected their parents and the latter's attitudes. We also observed indications that land loss aversion was associated with less willingness to sell land if land sales were legalized. We also found that land loss aversion was associated with higher minimum WTA sales values for land. Overall, we therefore cannot reject this hypothesis.

The third hypothesis stated: "*Land certification has contributed to increasing land values*". The land certificate variable was not significant in any of the models, but households where only the husband's name appeared on the certificate valued their land more highly. This could also be a reverse causality effect: Husbands who valued their land to a greater extent, ensured that only their own names appeared on their land certificate. Therefore, this may not be evidence that land certification has led to increasing land values. The variable indicating the share of households in the community with a land certificate was significant (at the 5% level) and positive in one of the land sale models but became insignificant when district*year interaction variables were included. The distribution of land certificates was delayed in Wondo Genet, and the share of households with land certificates was lower in this region than in the other areas. We cannot exclude the possibility that the weaker growth in land values in Wondo Genet is related to these delays in land certification, but this effect could also be confounded with several other factors. There have been ethnic disagreements and administrative changes in Wondo Genet that may have contributed to the lower growth in perceived land values. The strong time trend in land values could also partly be an effect of strengthened individual land rights and land certification, but again, it is difficult to distinguish this from other factors. We conclude that we have some but weak supportive evidence in favor of the third hypothesis.

The fourth hypothesis stated: "*Men are more willing to allow land sales than women*". The share of men opposed to legalizing land sales was as large as the share of women opposed to it in 2012. However, there was a significantly smaller share of female-headed households that would be willing to sell land if doing so were legal. Based on these two results, we cannot reject the hypothesis.

The final hypothesis stated: "*Cash cropping is associated with greater interest in allowing land sales*". Wondo Genet is a cash-cropping area. A larger share of the households there was willing to provide a compensation value for land, and a larger share was willing to sell their land if it were legal. Among the respondents in this area, 83% of the wives and 88% of the husbands preferred land sales to remain illegal in 2012, which is only slightly below the figures for the other areas. Wondo Genet also exhibited the highest average level of land loss aversion. We may conclude that there are slightly more households willing to sell land in this cash-cropping area, but there is still a large majority that fears the land sales market. The evidence in favor of the hypothesis is therefore weak.

6. Conclusion

While Ethiopia has undertaken land reform to strengthen individual land use rights, land sales remain illegal in the dominant smallholder agricultural sector. The country has attempted to commercialize agriculture by allowing long-term leases of land to commercial actors that have been allocated large tracts of land, in contrast to the maximum farm size of 2.5 ha in the most recent rural land proclamations. Our study reveals, however, that the state is not the only force preventing land sales in the smallholder sector. The large majority of such households continue to prefer to maintain the status quo, although the constitutional right to own land to produce food sufficient for one's own subsistence can no longer be satisfied in many parts of the densely populated highlands.

Ethiopia has a similar land tenure system to those in China and Vietnam and also recently achieved promising economic growth, indicating that Ethiopia may be able to follow the economic development path of these Asian countries. However, Ethiopia remains far behind. Vietnam and China are also gradually allowing greater market activity in the land sector such as mortgaging of land and, in Vietnam, even land sales. The use of more long-term lease contracts is a natural step in this direction. The land rental restrictions in Ethiopia that only allow smallholders to rent out a maximum of 50% of their land are designed to avoid outmigration and the development of a class of absentee landlords. The egalitarian principles and emphasis on land as a safety net remain politically important. One example is the rule that only landless persons can inherit land. Another regulation implemented in certain regions stipulates that individuals with government jobs cannot own rural land. There is a risk, however, that these strict restrictions also exacerbate rural poverty traps. They may reduce migration in the short run but lead to greater destitute migration in the future. Longer-term leases could facilitate smallholder commercialization and provide landowners with the capital and more flexibility to migrate and begin a different business elsewhere. With sharp increases in land values in urban and peri-urban

areas, the following question remains: how should the rent from such land be shared? If land compensation is only paid according to the agricultural production value with traditional crops, the state and potential new users will obtain the additional rent, and how they divide it will depend on the contracts allocating land from the state to new occupants. While this is not an issue when land is taken for public purposes such as the construction of roads, public buildings, etc., the private sector will become increasingly important as a demander of land for business development.

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Appendix 1

Questions 2007 and 2012: To household (head)

37*	If your land were suddenly demanded for public purposes by the kebelle, how much compensation, minimum, would you consider to be a fair compensation for loosing your land? Price without value of your house and other buildings on your land	Birr	
38	If it became legal to sell land, would you consider to sell the land if you got a good price? 1=Yes, 0=No, 2=Only if I came in a desperate situation,	Code	
39	If you were allowed to sell your land and are willing to sell it, how much would be the minimum acceptable price for you to sell it now? Price without value of your house and other buildings on your land.	Birr	

Separate questions to men and women in 2007 and 2012

Perceptions and opinions:

S.no	Question	Unit	Answer
4	Land sales should be illegal? 1=Yes, 0=No	Code	
5	Land mortgaging should be illegal? 1=Yes, 0=No	Code	

1. Land loss aversion (Questions 2012 only)

After having played a similar lottery with money the following hypothetical lottery with land was played:

Instruction to players (husband and wife jointly): Now assume a similar (but only hypothetical) game with land but where you should aim to respond as if it was real.

Instructions to instructors: A switch point should be identified from Lottery A to Lottery B. If players have difficulty in imagining the land sizes, use some measure like to size of a room they sit in or some other measure to help them get a good idea.

No	Lottery A	Choice	Lottery B	Choice
1	50% of winning 250 m^2 farmland and 50% of losing 50 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 200 m^2 farmland	
2	50% of winning 40 m^2 farmland and 50% of losing 50 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 200 m^2 farmland	
3	50% of winning 10 m^2 farmland and 50% of losing 50 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 200 m^2 farmland	
4	50% of winning 10 m^2 farmland and 50% of losing 50 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 160 m^2 farmland	
5	50% of winning 10 m^2 farmland and 50% of losing 80 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 160 m^2 farmland	
6	50% of winning 10 m^2 farmland and 50% of losing 80 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 140 m^2 farmland	
7	50% of winning 10 m^2 farmland and 50% of losing 80 m^2 farmland		50% of winning 300 m^2 farmland and 50% of losing 110 m^2 farmland	