Land Markets, Landslides and Social Norms: New Insights from a Discrete Choice Experiment

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Bioeconomics Working Paper Series

Working Paper 2018/10

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Kewan MERTENS [1] and Liesbet VRANKEN [2]

Abstract

This article investigates how moral concerns and social norms influence the supply side of land markets in the presence of landslides in Uganda. We first collected detailed data on plot ownership, plot location and exposure to landslides among 401 farmers in Western Uganda. Then a discrete choice experiment (DCE) was conducted on the hypothetical sales of these plots in order to elicit preferences for specific buyer characteristics among respondents. We find indications of a social norm on land transactions in the presence of landslide risk. We find that people prefer to sell their plots to family members (and are therefore ready to forego some revenue from the sale) and that they prefer to sell to poorer buyers as long as the plots are not susceptible to landslides. When the plots are susceptible to landslides, no preference is shown to sell plots to less wealthy buyers. Our results add to the literature on land markets and social norms in the presence of environmental risks by illustrating the importance of considering rationales which are different from monetary cost-benefit analyses in the Global South. We show that it is possible to do this in a quantitative way by means of Discrete Choice Experiments.

Key Words: Disaster Risk Reduction, DRR, land transaction, Uganda, family network, extended family, risk prevention

JEL classification: Q150,Z130, D900

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Acknowledgements

This study would not have been possible without the dedicated effort of all enumerators involved in the data collection, the local chair persons and the farmers that provided us with abovementioned information. We would also like to thank the logistical support provided by the Mountains of the Moon University (MMU). The financial support was received from the AfReSlide project, BR/121/A2/AfReSlide, titled 'Landslides in Equatorial Africa: Identifying culturally, technically and economically feasible resilience strategies', funded by the Belgian Science Policy (BELSPO). We would also like to thank the VLIR UOS South Initiative, ZEIN2013Z145, called 'Diagnosis of land degradation processes, their socio-economical and physical controls and implications in the Mt. Rwenzori region'

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Note: data will be uploaded in a Mendeley database before final publication.

1. Introduction

A large body of studies demonstrates the importance of solidarity mechanisms and social norms in the presence of economic risks (Fafchamps, 2011, 1992). Regarding access to land, for example, communal property regimes have been shown to function as an insurance system against shocks (Baland and Francois, 2005; Delpierre et al., 2012) and a recent study has investigated norm-based temporary and non-monetary transfers of land to poorer households as an ex ante risk reduction measure in The Gambia (Beck and Bjerge, 2017).

These studies within (neo-classical) economics do, however, frequently treat such solidarity mechanisms as something that is happening outside normal economic markets, or as an extension to it. They therefore argue that an increasing market integration and formalization could lead to the erosion of such solidarity schemes (Beck and Bjerge, 2017; Platteau, 1996).

Yet, it is well-known that the distinction between reciprocity and market exchange is not clear-cut and that market transactions should always be regarded as socially embedded (Colin and Ayouz, 2006; George A. Akerlof, 1987; Polanyi, 2001; Promsopha, 2017; Sjaastad, 2003). Human behaviour is “inextricably interwoven with moral and ethical judgments about the fairness of the world” (Platteau, 1994), as well as with long-term considerations of power, social network and human relations (Colin and Ayouz, 2006; Promsopha, 2012). Therefore the sale, bequeathing and acquisition of land is a contingent and social act, which has long-term consequences and involves more than pecuniary cost benefit analyses from the different parties (Beck and Bjerge, 2017).

While theoretically acknowledged, empirical studies on land markets do not frequently take this into account. The reason is essentially methodological. How to account for the multiple drivers of social interactions in a quantitative way which at the same time allows to find trends which are representative for a whole sub-population? For modelling purpose, economic literature has tended to oversimplify structures and processes of land ownership and land transactions, thereby dichotomizing complex structures into market versus non-market behaviour, or private versus communal property (Cohen, 2001; Promsopha, 2017; Schlager and Ostrom, 2016).

Recently, (behavioural) economists have been developing new ways to investigate non-classical drivers for economic transactions. Lab-in-the-field experiments are increasingly being used to quantitatively investigate these processes, long-studied in sociological and anthropological sciences, that do not correspond with standard utility theory (Cárdenas and Carpenter, 2008). Environmental and health economists, on the other hand, have made us of tools such as Discrete Choice Experiments (DCE) to measure preferences which are not easily observed in existing markets.

In this paper we combine insights from behavioural economics on social norms with a tool from environmental and health economics, DCE, to identify the role of social norms in decision making in the presence of an environmental risk on the land market. DCE allow to elicit preferences for specific attributes of existing goods and services. While these goods may be transacted through economic markets, revealed preferences do often not allow to differentiate utility between different attributes. DCE provide a way to identify the relative importance of various attributes associated with a particular good or service (Louviere and Hensher, 1982).

The contribution of this paper is twofold. First, we propose and test a new methodology to quantitatively elicit normative preferences that can be involved in any sort of transaction. We think that it has a lot of applications for studies that are interested in moral and normative preferences, such as studies in environmental economics and ecological economics. Secondly, we apply this methodology to test for the relative importance of specific normative preferences regarding land transactions in the presence of landslide risk in rural Uganda. We thus contribute to a rich literature on land transactions in the Global South, building a quantitative bridge between economic and anthropological research in the region (Baland et al., 2007; Holden et al., 2011; van Leeuwen, 2014).

2. Conceptual framework

There is a rich literature documenting the existence of informal insurance schemes against shocks (Caudell et al., 2015; De Weerdt and Dercon, 2006; Fafchamps, 2011). These systems have sometimes been interpreted as informal contractual arrangements which derive from a repeated game between rational, self-interested individuals (i.e. the zero contribution hypothesis; Fafchamps (1992); Ostrom (2014)). It is, however, more and more acknowledged that the simple principles of game theory do not adequately explain the dynamics and stability of these systems. Recent decades have therefore known an increased interest in the role (social) norms may play in guiding (economic) behaviour (Burke and Young, 2011; Elster, 1989; Fafchamps, 2011).

We define norms as informal rules which say how people should act, or not act, in particular circumstances. A social norm can be defined as a "common standard within a social group regarding socially acceptable or appropriate behaviour in particular social situations […]" (Chandler and Munday, 2011). Economists tend to view norms as internalized outcomes of an optimization at group level over time (Fafchamps, 2003; Platteau, 1994), while others see them as the result of an evolutionary optimization (Basov, 2016; Kasper and Mulder, 2015; Young, 2007) or, alternatively, as the result of human tendency to get passionate about certain fields of activity (Bourdieu, 1994). These perspectives on social norms are not mutually exclusive. Since we are interested in land sales our argumentation and discussion will be built around an economists approach to social norms.

For our conceptual framework we will therefore initially assume that a social norm exists which incites people within the same social network to support each other in case of distress due to landslides. The assumption [A1] of mutual support in times of distress is reasonable, given the large literature on risk sharing and solidarity networks in rural societies (Fafchamps, 2011, 1992)[3]. This assumption implies that we also assume that the occurrence of landslides is considered as a factor outside the control of the affected individuals [A2] and that we are having relatively closed local networks at village level with no formal insurance systems against landslides [A3] and limited immigration [A4]. This assumption is needed because it has been observed that norms for mutual solidarity tend to be strongest among kin or close neighbours and when the reasons for distress are considered to be outside the power of the affected individuals (Kasper and Mulder, 2015; Ostrom, 2000). Typically, in such closed communities[4], people know their neighbours very well and members of the extended family are never far away. In the presence of a social norm for support, the occurrence of landslides on a farmer's plots can have serious consequences for the extended family whenever the affected farmer is not able to handle the income shock and falls in a condition of poverty and need. Indeed, this person will need financial or material support from his/her family members or neighbours. Such ex post solidarity is, however, inefficient, because it requires a sudden mobilization of resources within the community. Despite being in a high-knowledge environment, an ex post solidarity system might also suffer from the problem of moral hazard, since farmers might take less landslide risk reduction measures if they are (informally) insured (Fafchamps, 1992).

Treating norms as internalized outcomes of an optimization at group level over time (Fafchamps and Lund, 2003; Xenitidou, 2014), we therefore hypothesize that a community which has been living with landslides for a long time might have developed additional social norms which aim at the *ex-ante* prevention of landslide related shocks that could translate into

[3] Several cases (including recent studies) exist where limited helping behaviour is observed, even among members of the same community (Kasper and Mulder, 2015). From our qualitative work in the region (see further), we do not think that this is the case here.

[4] We employ 'community' interchangeably for local social network, which can consist of extended family members, neighbours or clan members.

a burden for the whole community. More specifically, we hypothesize that social norms might exist which prevent those farmers who would not be able to cope with a serious income shock from acquiring plots which have a high landslide risk. We investigate the presence of such norms at the supply side of the land markets, whereby farmers who want to sell a plot are incited to preferentially sell to non-vulnerable community members whenever these plots have a high landslide susceptibility.

3. Background and study area

The conceptual framework and research questions in this article have been developed during three years of research in the Ruwenzori region, including nine months of fieldwork and both qualitative and quantitative analyses. The Ruwenzori region covers an area of approximately 3000 km2 spread over 31 sub-counties in four districts: Bundibugyo, Kasese, Kabarole and Ntoroko (Figure 1).

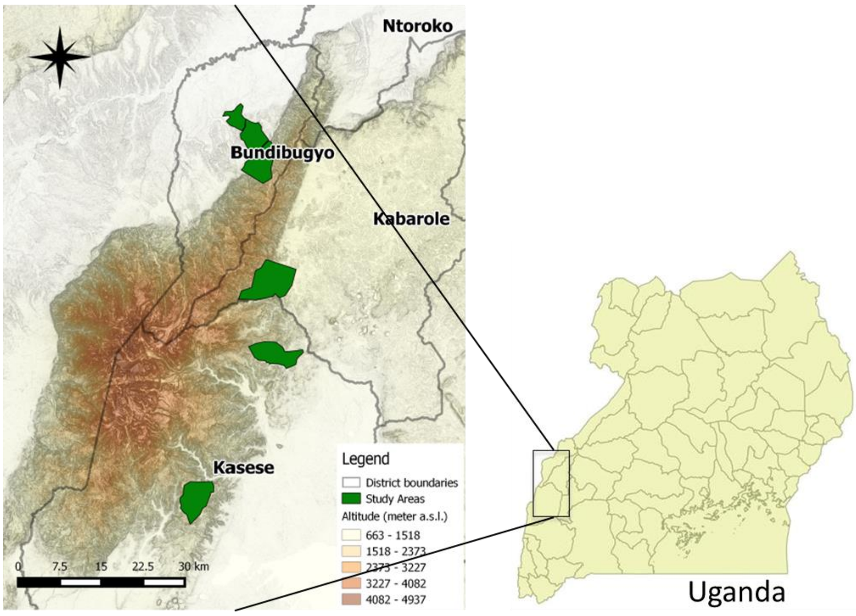

Figure 1: Overview of the study area. Darker areas have a steeper slope (adapted from Mertens et al. (2016))

3.1. Culture and family structure

Historically, the Rwenzori region can be considered a transition zone between the Buganda kingdom and Congo basin, thereby developing specific cultural formations (Pennacini, 2007). At present, different cultural groups, or ethnicities, populate the Ruwenzori mountains, the numerically largest groups being Bakonzo, Babouissi, Bamba and Batoro. While it has been argued that the distinction between ethnic groups mostly stems from attempts of colonial authorities and ethnologists to get an overview on the structure of local society (Kodesh, 2008), ethnicity currently plays an important role in the construction of identity of individuals and groups, as well as in the political arena of the state (Pennacini, 2007; Stacey, 2003). The different groups distinguish one another by their language (or dialect) and names, and recent clashes between people in the region have partly been attributed to 'ethnic' tensions (Pennacini, 2007; Reuss and Titeca, 2017). These ethnic identities should, however, be considered as superficial banners below which a whole lot of historical, social-economic and political conflicts are at play (Reuss and Titeca, 2017).

Besides ethnicity, and crossing ethnic boundaries, clans (*Enganda* in Luganda) play an important role in the imaginary and identity of the people in Western Uganda (Willis, 1997). Recent anthropological research argues that, in contrast to ethnicity, clans and their totems have existed before colonization and that they have been playing an important role in connecting people in the pre-colonial society (Buchanan, 1978; François, 2004; Kodesh, 2008; Willis, 1997). Rather than showing kinship relations, clans express former arrangements of clientship and authority and thus illustrate relations in stated tradition (Buchanan, 1978; Willis, 1997). The current patchwork of clans is the result of overlapping and contested social constructs, which function(ned) as vehicles and connecting bridges for the diffusion of power and the transfer of knowledge (Kodesh, 2008; Willis, 1997). The existence of overlapping clans and totems across different ethnicities illustrates a "systematized perception of sameness coexisting alongside more closely bounded systems of ethnic identity" (Buchanan, 1978).

While clan membership has historically not been tied to access to land, present rarefication of the land has caused clan elders to prefer land to be given or sold to members of the same clan (François, 2004). Increasingly, clan membership has thus been used to wretch (spiritual and economic) control over land and other resources (Kodesh, 2008). While formal institutions tend towards more private tenure arrangements, the distinction with communal land tenure arrangements is not always clear cut. Both are still available in Western Uganda and clan membership continues to play an important role in the access to land (Deininger et al., 2008; Willis, 1997).

3.2. Land markets

This does not impede land sales markets from being very active in Western Uganda (Deininger and Ali, 2008; Deininger and Castagnini, 2006; van Leeuwen, 2014). Farmers frequently buy and sell land, and also *inter-vivo* and *ex mortem* transfers are very common. Most of these transactions occur in a semi-formal manner, in the presence of the local chief who writes a land agreement, but without issuing an official title. Despite attempts to introduce a national titling scheme, only 7% of the plots in our sample do have a land title. It is widely accepted, though, that local tenure systems, without formal titling and *de jure* enforcement, are often more efficient in practice and can provide sufficient local tenure security for land investments (Baland et al., 1999; Brasselle et al., 2002; Katz et al., 2000; Omura, 2008; Platteau, 1996).

Land sales markets in Western Uganda are active, but they are not fully ‘free’. Contrary to official regulation at national level, land in our study region is mostly owned, inherited and transacted by males only. Moreover, there is a strong preference to keep land within ownership of members of the same extended family or clan (François, 2004). Additionally, when mapping the plots owned by the households in our sample, we noted that several farmers felt tenure insecure and feared land grabbing. This is probably caused by the lack of titles and the consequential institutional multiplicity in the region (Deininger and Ali, 2008; van Leeuwen, 2014).

3.3. Landslides

Every year, during the rainy seasons or following seismic activity landslides occur at different locations and elevations in this region (Jacobs et al., 2017). The location of these landslides is determined by the type of the soil, slope length and steepness, vegetation cover and local variations in topography (e.g. whether in a concavity or a convexity). Landslide density has been shown to vary between 3 and 4.9 slides / km2 (Jacobs et al., 2017). These landslides destroy crops and productive assets such as soil fertility and therefore have a significant impact on the income of farmers in the region (Mertens et al., 2016).

Previous studies in the region suggest that farmers are very aware of the threat caused by landslides, but that they have limited options to reduce landslide susceptibility (Mertens et al., 2018). The lack of formal insurance mechanisms compels farmers to rely on emergency measures and social networks to cope with the idiosyncratic income shock caused by landslides (Mertens et al., 2016). A recent study has shown that farmers take into account landslide susceptibility when transacting land in the Ruwenzori region (Mertens and Vranken, 2018). It was found that farmers who are initially more exposed to landslides manage to reduce their average exposure to some extent by acquiring plots outside landslide prone areas. A basic assumption behind that research was that transactions are driven by (discounted) utility maximization and disaster avoidance by the land buyers. In current study, an alternative explanation for the observed trend in land transactions in the Ruwenzori region is investigated. The two explanations, in current research and in Mertens and Vranken (2018), are not exclusive, but complementary.

4. Data and methodology

Quantitative empirical research on social norms is confronted with a set of challenges. Social norms and values can be explicitly enquired for through surveys, which typically make use of

Likert-scale subjective questions. Such studies, such as the World Values Survey, are confronted with the highly hypothetical nature of the questions and strong limitations regarding the complexity of norms and values that can be enquired for (Alesina and Giuliano, 2011). Alternatively, behaviour can be tested in experimental research in laboratories (Ostrom, 2000). The artificial and ephemeral nature of these studies sometimes makes it difficult to link their results to behaviour in real-life situations. Some notable lab in the field experiments have attempted to narrow this gap, while preserving the capacity to control for confounding factors (Frey and Meier, 2004). Others have attempted to demonstrate social norms by showing real-life behaviour which is predicted by theory (Kasper and Mulder, 2015). The problem with the latter approach is that social norms are not measured as such, but rather constitute the explanatory framework for the interpretation of a specific behaviour. Moreover, a large gap might still exist between actual behaviour and what is considered to be 'ideal' according to one's norms. When analysing social norms, one should be able to distinguish the norm itself from the actual behaviour which might be influenced by the norm to a more or lesser extent.

In this study we employ a discrete choice experiment (DCE), which was implemented during a structured household survey, to directly measure a set of rather complex social norms. While still hypothetical in nature, our approach allows us to measure norms, or more precisely, the preferences driven by these norms, without explicitly enquiring for them.

4.1. The household survey

We surveyed a stratified two-stage random sample of 401 households (HHs) in 41 remote villages in the Rwenzori region (Figure 1). Villages and HHs affected by landslides were identified prior to the survey implementation, respectively through workshops and field visits at district level, as well as village-level interviews with local chair persons in June- September 2014 (see Mertens et al., 2016). The villages were subsequently stratified on the presence of recent landslides, and the HHs in each village were stratified on whether they had been affected by a landslide in the previous 15 years. Households that have experienced landslides have been oversampled.

The HHs in our sample were visited for a first time with paper questionnaires in February-March 2015 and a second time with questionnaires on tablets in August-September 2016. The second round was entirely developed to investigate the role of land markets and the interactions with social norms. Additional plots were mapped and the choice experiment was played with the respondents. Only HHs that were interviewed in both rounds are included in this analysis. Attrition is very low (3%). Four HHs were dropped during data cleaning, because the HH head refused to answer questions on plot cultivation and ownership. Our final sample therefore contains 397 HHs. An overview of the sample characteristics is given in Table 2 and Table 3.

The questionnaires included questions on household demographics, perceptions and experience with landslides, detailed information on plot transactions and plot cultivation, as well as all questions needed to determine household income (Grosh and Glewwe, 2000). Individual plots were mapped with GPS. Plots are defined as continuous pieces of land that were obtained during a same land transaction. If two adjacent pieces of land were obtained at different moments in time, we therefore consider them as different plots.

4.2. Geographic information at plot level

GPS points were taken in front of the farm houses and on the corners of each plot owned or cultivated by the HHs. Some plots could not be mapped due to refusal by the owner to bring the enumerators to their plots[5]. In total 794 plots, or 75 % of the 1064 plots owned by the households in our sample, have been mapped with a GPS.

The georeferencing of the plots was used to extract information about their size, landslide susceptibility, slope steepness, as well as distance from the house and from the road network. The use of GPS devices to georeference plots has been praised for being a cheap and accurate technique of obtaining detailed geographical information about plots (Carletto et al., 2016).

The probability to have a landslide on a plot is determined by the probability that a landslide starts on the plot or in the close surroundings of the plot. This probability was therefore calculated by estimating the landslide susceptibility in a buffer of 30 meters around the plot. The susceptibility data were obtained from a regional landslide susceptibility map produced through logistic regression modelling at 30m resolution. The main variables taken into account for this susceptibility assessment were lithology, average annual precipitation and topographic variables such as slope gradient, curvature, topographic wetness and aspect. Field inventories were used to calibrate and validate the model (Jacobs et al., 2017b). After extracting landslide susceptibility estimates for all plots, the data were normalized over the whole sample.

4.3. DCE for Eliciting preferences

Respondents were asked to consider the hypothetical case in which they would decide to sell one of their plots because of an urgent need for money (e.g. to pay for school fees). We made use of a DCE to elicit the preferences regarding the characteristics of a hypothetical buyer. These preferences were elicited for each of the plots owned and cultivated by the household (Figure 2).

[5] This was most frequently related to an excessive walking distance from the house to the plot. Other plots could not be mapped because the boundaries were contested by neighbours, because technical errors were made during mapping, or because the plots were rented in and the agreement was needed from the owner.

Choice experiments are based on random utility theory, thereby assuming that the respondent makes a choice based on rational weighting of utility losses and gains related to the attributes of each choice (McFadden, 1973). These losses and gains are driven by both monetary and non-monetary considerations. In our case the non-monetary motivations are both internally (personal feeling of doing well, given a set of norms) and externally driven (benefit of showing to others that one is a good person).

Attributes and attribute levels are determined by our research question, qualitative interviews and try-outs in the field. They consist of some characteristics of the potential buyer, as well as on the price offered. A labelled choice experiment is used. That means that one of the attributes, the label, is considered more important and that its levels are always present in a structured way (see Figure 3 for an illustration). The label represents three different scenarios reflecting the relatedness between the respondent and the buyer. A possibility for opting-out, i.e. to refuse to sell the plot to any of the proposed buyers, is also provided. There are three additional attributes: 1) the wealth status of the buyer; 2) the spatial origin of the buyer; and 3) the price offered for the plot (Table 1). As such the choice options differ only in three characteristics of the buyer and the price that is offered for the plot.

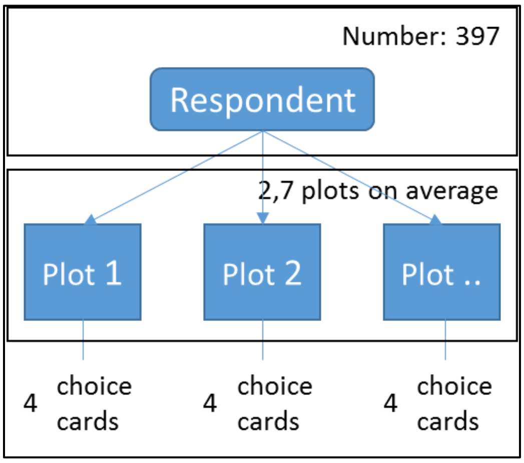

Figure 2: Structure of the choice experiment: blocks of 4 choice cards each were randomized over the plots and within each block the order of the choice cards was randomly reshuffled every time. The sample consists of 397 respondents which each have 2.7 plots on average.

The label on the relatedness between the respondent and the buyer reflects the great importance that is attributed to the kinship and cultural ties, both for transacting land and for demanding assistance in times of need. Relatedness with the potential buyer was included as a label, rather than a simple attribute, because we expect preferences for certain attributes to be different depending on whether the potential buyer is from the extended family, from the same clan but a different family or from neither family nor clan.

The wealth status, measured by the number of plots currently owned by the hypothetical buyer, reflects its current need for land (which is supposed to be high if the buyer does not have any plot) and its future capacity to cope with landslide shocks (which is supposed to be higher if the buyer already has several plots). Of course, these reflections were not mentioned to the interviewers nor the respondents.

The origin of the buyer, whether s/he is from this area or not, reflects the cultural affinity with the respondent, and is a partial proxy for the likelihood of being neighbours in the future[6].

The price offered by the buyer is a monetary attribute and explicitly states how much money the buyer is offering for the plot. Since plot prices are often the result of a long bargaining process, we stressed that it represents the price offered at the end of the bargaining process, so that it is the real amount of money that will be received from selling the plot. Due to differences in accessibility, climate and market integration, prices for land vary strongly within our study area, ranging from prices as low as 2 million Ush/ha (1950 USD/ha) in the remote areas to prices above 10 million Ush/ha (9720 USD/ha) in the cocoa region (purchasing power parity in 2010-2014 from The World Bank (2015)). We therefore opted to work with relative price, expressed as a percentage of the average plot price in the village. To limit the cognitive burden for the respondent, we therefore asked for average plot prices in the village (per ha) first and used this price to automatically calculate the plot prices offered in the DCE[7].

The opt-out option allowed respondents to decide not to sell the plot to any of the proposed buyers if these buyers, or the prices they offer, did not correspond with preferences of the respondent.

[6] The likelihood of being neighbours is probably highly correlated with the number of plots already owned by the potential buyer (if the buyer does not own a plot, s/he is likely to become a neighbour if you sell a neighbouring plot) and might therefore not been adequately captured by the 'origin' attribute.

[7] This is one of the advantages of working with tablets. It is particularly useful given the difficulties we encountered in expressing plot prices in a price per hectare. By letting the respondents use their own interpretation of what is a hectare and what is the average price per hectare, we avoid confusion related to both prices and plot sizes.

Table 1: Overview of attributes and levels of the DCE. The attributes in this choice experiment are about the buyer, not about the plot. The price reflects the maximum price the buyer is willing to give for the plot. We used the existing plots for this hypothetical sale.

Label = relatedness with buyer	Within extended family
	Same clan and ethnicity, but not extended family
	Different clan, different ethnicity [baseline in analysis]
Wealth status buyer	Very rich = has a lot of land [baseline in analysis]
	Average = has one other plot
	Very poor = has no other plot
Origin buyer	From this or neighbouring village [baseline in analysis]
	Not from nearby village
Price	Very cheap: 33 % of normal plot price [baseline in analysis]
	Somewhat cheap: 50 % of normal plot price
	Average-cheap: 67 % of normal plot price
	Average-expensive: 150 % of normal plot price
	Somewhat expensive: 200 % of normal plot price
	Very expensive: 300 % of normal plot price

We made use of 42 choice cards in 12 blocks of 4 cards (D-error = 0.0246)[8]. We opted for a maximum of 4 cards per plot so that farmers with many plots would not be confronted with an excessively long interview. To avoid ordering effects, choice cards were shown in a random order (Day et al., 2012).

Several measures have been taken to make the DCE as realistic as possible. First, the DCE was implemented for each of the plots owned and cultivated by the household. The use of the real productive assets as (hypothetical) stakes in the DCE likely increased the concreteness of the game. The use of real plots allowed us to investigate interactions between attributes in the DCE and existing plot characteristics, like landslide susceptibility, without having to explicitly include these plot characteristics as attributes in the experiment. To make sure that it was clear to the household which plot was being 'sold', several characteristics of the plot, as previously mentioned by the respondent, were reiterated at the beginning of each DCE. These characteristics include walking distance from the house, plot size (in own units), year of acquisition, self-assessed landslide susceptibility and whether a landslide ever happened on the plot or not (Figure 3).

Secondly, the choice experiment and its separate attributes were carefully explained and a cheap talk script was used to limit the hypothetical bias and the social desirability bias which arise from doing an hypothetical choice experiment on decisions involving norms (Silva et al., 2011). According to Silva et al. (2011) cheap talk which is generic with respect to the good, easy to understand and short enough might help in reducing the social desirability bias. Despite the

[8] A full factorial design of unique choice cards with trade-offs between buyer characteristics as well as price could be created from the attributes and their levels, but this would result in 108 possible combinations (36*3) for each potential buyer, which would imply (108*107*109) = 1,224,936 possible choice cards. A D-efficient design was therefore necessary to limit the number of choice cards while retaining maximal variation. Ngene software was used for the optimization .

hypothetical nature of the experiment, enumerators stressed the importance giving answers corresponding with what they would choose in a real life transaction.

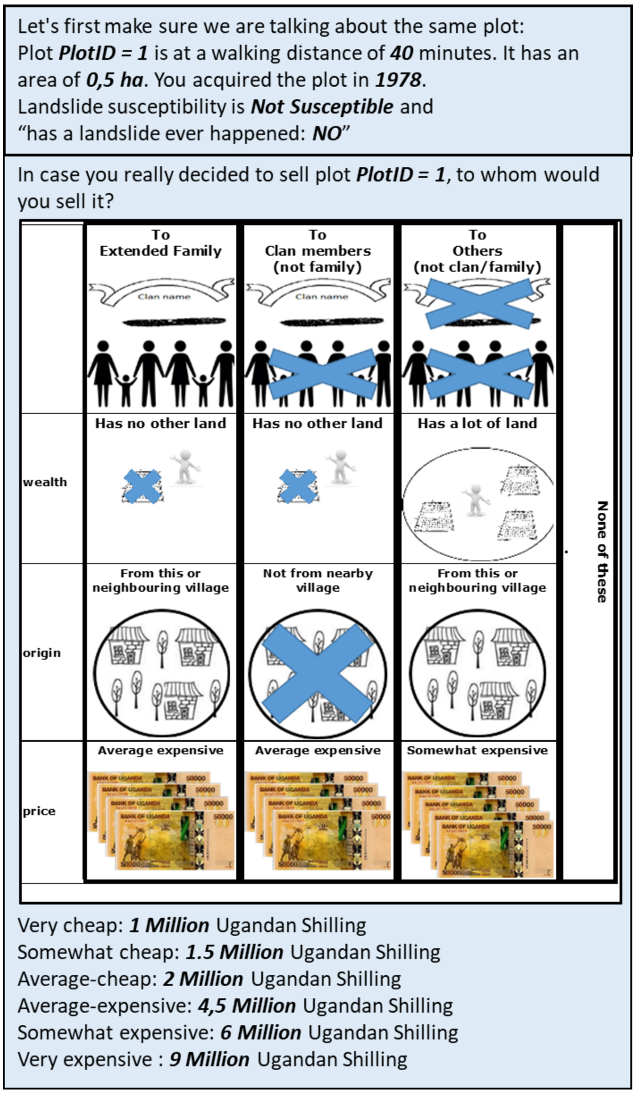

Figure 3: Example of a choice card, as was presented during the interview. In this example the average plot price in the village, as mentioned by the respondent, was 6 Million Ush/ha (2917 USD/ha in purchasing power parity; The World Bank (2015)). Text in ***Botalic*** *are automatically calculated based on previous answers given by the respondent.*

In order to account for attribute non-attendance, each choice experiment was followed by a question whether some attributes had never been taken into account during that choice experiment (Hess and Hensher, 2010). This information on stated attribute non-attendance has been used to confirm our results during robustness checks (Appendix A1).

To test our approach with DCE, Likert-scale questions on social norms were asked towards the end of each interview. The results of these questions are also presented as a robustness check and to illustrate the value of our alternative approach.

4.4. Empirical analysis

A multinomial random parameter logit model (mixed logit model) is used to estimate the preference for specific buyer characteristics, while allowing for heterogeneity in taste across the respondents (Hensher and Greene, 2003; Hole, 2007). Data analysis was done in NLogit software (Greene, 2000).

The utility U associated with a sale of plot p to a potential buyer i, as evaluated by each respondent n, is represented as follows:

$$U_{ipn} = \beta_i X_{ipn} + \sigma_{in} X_{ipn} + \varepsilon_{ipn} \qquad \textit{Eq. 1}$$

Whereby X_{ipn} is a vector of explanatory variables relating to buyer i (= alternative i). This vector includes an alternative specific constant (ASC), i.e. an intercept, for each choice as well as dummies for the attributes of the choice alternative, being wealth and origin of the buyer, as well as the price that is offered. β_i is a vector of alternative-specific preference parameters associated with the attributes of the potential buyers. σ_{in} is a vector of individual-specific standard deviation parameters which is estimated for each alternative i. The error component ε_{ipn} is distributed iid extreme value across alternatives and respondents.

In previous model, heterogeneity in taste is allowed across respondents, but it is not clear where that heterogeneity is derived from. The hypothesis of this research is that the plot characteristics, and their interaction with buyer characteristics, are important for the utility respondents would derive from a potential sale. We therefore also estimate the following equation:

$$U_{ipn} = \beta_i X_{ipn} + \sigma_{in} X_{ipn} + \gamma_i X_{ipn} * PC_{pn} + \varepsilon_{ipn} \qquad \textit{Eq. 2}$$

Whereby X_{ipn} is again a vector of explanatory variables relating to alternative i, while β_i and σ_{in} are respectively alternative-specific preference parameters and standard deviations. PC_{pn} stands for 'plot characteristics' and represents either the measured landslide susceptibility on the plot (continuous variable), or the self-reported presence of landslides (dummy = 1 when a landslide has ever happened on the plot). γ_i is a vector of alternative-specific preference parameters associated with the interaction of plot characteristics with attributes of the potential buyers. It should be interpreted as how much the effect of X_{ipn} is larger or smaller among plots that have characteristic PC_{pn} than among other plots. The error component ε_{ipn} is independently and identically distributed (iid) extreme value across alternatives, plots and respondents. In order to not overload the model, random coefficients are only allowed at the level of the single variable and not for their interactions (Greene, 2000; Revelt and Train, 1999; Train, 2002).

Alternative interaction terms with PC_{pn} in equation 2 have been introduced to test for the robustness of the results. The purpose of these robustness checks is (1) to confirm that our main findings regarding landslide susceptibility are not a statistical artefact of our research design; and (2) to check for other plot characteristics that might be influencing preferences regarding the buyer of these plots. We investigated the interaction with a dummy for whether the land can be sold to people external to the clan, for whether the land was inherited or received, as opposed to purchased, for whether permission from the extended family is needed for sales, for whether the family house is present on the plot and for whether perennial crops are cultivated on the plot. We also investigated an interaction with the walking distance between the plot and the house (minutes).

Finally, marginal rates of substitution between attributes and the price offered by a potential buyer have been calculated by means of the Krinsky Robb method with 1000 draws (Hole, 2007; Krinsky and Robb, 1986a, 1986b). This marginal rate of substitution is equivalent to calculating the willingness to accept lower or higher prices depending on specific buyer characteristics ($MRS_i = \frac{\beta_{attribute\ i}}{\beta_{price}}$). We do, however, only use this result as a measure for comparing the relative importance of the different attributes.

5. Results

5.1. Descriptive statistics

A summary table of household characteristics in our sample is presented in Table 2. All households derive most of their income from agriculture and average income per adult equivalent is 2.83 USD (purchasing power parity; The World Bank (2015)). Cash crops are mainly coffee, cocoa or banana plants, while the most important food crops are cooking banana, cassava, cocoyam, beans, maize and potatoes. The farmers in our sample own on average 2.7 plots each, of an average size of 0.4 ha.

Table 1: Socio-economic characteristics of households in the sample: averages, followed by standard deviations between brackets.

Household characteristics at the time of the survey	
Age household (HH) head	46.56
	(15.39)
Years of formal education HH head	5.77
	(4.04)
Adult equivalents (OECD scales)	3.50
	(1.19)
Income [Ush/adult equivalent/day]	3221
	(4291)
% of income from agriculture	86.06
	(22.83)
Total area owned [Ha]	1.21
	(1.25)
Number of plots owned	2.68
	(1.84)
Number of plots purchased	1.43
	(1.59)
Average distance between plots [m]	536
	(650)
Sample characteristics	
Total # of plots	1064
Percentage of plots that are mapped	75
Observations (# HHs)	397

An overview of the plot characteristics for the whole sample, and subdivided according to whether the measured susceptibility on the plot is above or below the Sub-County median is presented in Table 3[9]. In total, the households in our sample own 1064 plots. Half of the plots have ever been affected by a landslide, according to the respondents, while 27% had a landslide in the past 15 years. While all plots in Table 3 are owned by the household, and more than 50% of these plots have been purchased, only 58% of all the plots can be sold without agreement from the extended family. However, 69% of the plots that need agreement could in theory be sold to people outside the extended family or clan. No differences exist in landslide susceptibility between plots that need agreement or not. Interestingly, more susceptible plots tend to be acquired at a later age and less frequently harbour the family house than less susceptible plots.

Table 3 also shows how frequently a potential buyer was selected in the DCE. In approximately half of the choice situations a family member was preferred, rather than another buyer or refusing to sell. The opt-out, being a refusal to sell the plot under any of the proposed conditions, was only selected in 4% of the cases. This is likely a consequence of the way in which our

[9] A threshold at Sub-County level was chosen because individuals base their choices on the experiences and observations of their surroundings. A farmer's preference is determined by what s/he learned to consider as a normal level of exposure by observing neighbours and discussing with friends. The median was chosen because it represents this best (Mertens and Vranken, 2018).

choice experiment was framed, and should therefore not be interpreted as a general willingness to sell land.

Table 2: Descriptive of plot characteristics for the whole sample (column 1) and subdivided according to whether the measured susceptibility on the plot is above or below the Sub-County median (columns 2 and 3 respectively). The result of T-tests on differences between groups are given between the columns (p < 0.10, ** p < 0.05, *** p < 0.01). Since not all plots have been mapped, column 2 and column 3 only include the 794 plots that were mapped. Landslide susceptibility ranges between min: -2.23; and max: 1.77.*

	Column 1 All	Column 2 Low susceptibility		Column 3 High susceptibility
Landslides				
Measured landslide Susceptibility	0.00	-0.60	***	0.58
	(0.99)	(0.91)		(0.68)
Did a landslide ever happen on the plot? (1 if yes)	0.50	0.50	***	0.62
	(0.50)	(0.50)		(0.49)
Has a landslide occurred on the plot in the last 15 years? (1 if yes)	0.27	0.18	***	0.37
	(0.44)	(0.39)		(0.48)
Plot characteristics				
Plot size (Ha)	0.40	0.41		0.41
	(0.49)	(0.53)		(0.40)
Age at which the plot has been acquired	32	30	**	32
	(15)	(14)		(15)
Purchased (= 1 if plot was purchased)	0.53	0.51		0.50
	(0.50)	(0.50)		(0.50)
The previous owner of the plot was richer than me at the time of the acquisition (1 if yes)	0.28 (0.45)	0.24 (0.43)		0.23 (0.42)
Would you be allowed to sell this plot without agreement from the extended family or the clan members? (1 if yes)	0.58 (0.49)	0.55 (0.50)		0.60 (0.49)
Would you be allowed to sell this plot to a person which is not member from the community/ clan/region? (1 if yes)	0.69 (0.46)	0.70 (0.46)		0.68 (0.47)
Land use				
The family house is on the plot (1 if yes)	0.43	0.59	***	0.47
	(0.50)	(0.49)		(0.50)
Cash crops or other perennial crops on the plot (1 if yes)	0.71	0.76		0.72
	(0.45)	(0.43)		(0.45)
Responses during choice experiment				
% of times that a hypothetical buyer was selected which is from the same (extended) family	52 (33)	53 (32)		50 (35)
% of times that a hypothetical buyer was selected which is from the same clan	25 (26)	23 (25)		26 (27)
% of times that a hypothetical buyer was selected which is neither from the same family nor clan	19 (28)	21 (28)		20 (30)
% of times that the opt-out (not selling) option was chosen	4	4		4
	(17)	(16)		(17)
Observations	1064	387		407

5.2. Mixed logit results

Table 4 presents the results of a mixed logit estimation without interaction terms (column 1) and with interaction with self-reported landslide occurrence (column 2) and measured landslide susceptibility on the plot (column 3).

In line with recurrent statements that land should not leave the extended family, the large and significant alternative specific constant for members of the extended family (ASC_F) suggests a strong preference to sell to extended family members. The negative alternative specific constant for opting out (ASC_O) is surprising, since this suggests that selling the plots to extended family members, and to some extend even to persons who are not from the family or clan, is preferred over not selling the plot at all (the status-quo). This can suggest that the proposed deals were considered to be attractive to the respondent, or that the respondents aimed at being very cooperative, which might suggest some form of social desirability bias (Norwood and Lusk, 2011).

While the preferences for higher prices is strong and significant across all alternatives, preferences for specific buyer characteristics are only significant among members of the extended family. In the model without interaction term (Table 4, column 1), there is a strong preference to sell to buyers that have zero or only one plot and that are not coming from a more distant village. There is a strong preference heterogeneity for the relatedness, and various buyer characteristics when the hypothetical buyer is a member of the extended family.

When including an interaction between buyer attributes and the variable for landslides, be it self-reported landslide occurrence or the measured landslide susceptibility, several elements come out. First, the self-reported presence of landslides and our measure for landslide susceptibility have very similar effects. They both do not have an effect on the preference to sell to family members, which remains high even in the presence of landslides, and both reduce the preference to sell plots to members of the extended family that do not have other plots and would therefore not be able to cope with the income shock caused by a landslide. So, on average there is a preference to sell plots to poor family members, this preference is reduced when landslides (can) happen on these plots.

For measured landslides susceptibility, but not for landslide occurrence, there is also a negative interaction terms with 'origin', suggesting that there is an lower preference to sell to family members which are not from the region when the plot is prone to landslides, but that this preference is not reduced in case an actual landslide occurred on the plot in the recent past. If a landslide happened on a plot, this remains visible for several years and is thus known by both people from the village and from outside. If no landslide actually happened, farmer experience in the area is needed to know the landslide susceptibility on a plot (Mertens et al., 2018). The difference between column 2 and column 3 of Table 4 could therefore suggest that respondents wouldn't want to sell a plot to a family member that wouldn't be aware of the risks involved in buying the plot.

Table 3: Results for multinomial mixed logit regression without (column 1) and with interaction terms (columns 2 and 3). In this table the interaction with "landslide" indicates a dummy for mentioned landslide occurrence in column 2 and a continuous variable for measured landslide susceptibility in column 3. The baseline scenario is a buyer who is not from the extended family or clan, has more than 1 plot, is from the same village and offers a 'very low price'. Standard errors are in parentheses (p < 0.10, ** p < 0.05, *** p < 0.01).*

	Column 1: No interaction		Column 2: Interaction Landslide occurrence		Column 3: Interaction Landslide susceptibility	
To Family	Coefficient	St. Dev.	Coefficient	St. Dev.	Coefficient	St. Dev.
ASC_F	1.10***	1.94***	0.91***	2.09***	1.11***	2.48***
	(0.19)	(0.12)	(0.26)	(0.12)	(0.25)	(0.16)
ASC * **Landslide**			**0.56* (0.32)**		**0.12 (0.20)**	
Buyer has 1 other plot	0.27**	0.50*	0.51***	0.69***	0.04	0.64***
	(0.13)	(0.28)	(0.19)	(0.25)	(0.16)	(0.25)
Buyer has 1 other plot *** Landslide**			**-0.60** (0.26)**		**-0.19 (0.16)**	
Buyer has no plot	0.91***	0.79***	1.07***	0.05	0.72***	0.59***
	(0.14)	(0.30)	(0.19)	(0.28)	(0.17)	(0.23)
Buyer has no plot *** Landslide**			**-0.57** (0.26)**		**-0.53*** (0.17)**	
Buyer is not from this village	-0.36***	1.35***	-0.32**	0.64	-0.44***	0.34
	(0.11)	(0.24)	(0.15)	(0.40)	(0.13)	(0.39)
Buyer is not from this village *** Landslide**			**-0.24 (0.21)**		**-0.37*** (0.13)**	
Price offered	0.0117***	0.0039***	0.0123***	0.0060***	0.0143***	0.0064***
	(0.0007)	(0.0010)	(0.0008)	(0.0010)	(0.0010)	(0.0010)
To clan member (but not family)						
ASC_C	-0.26	1.13***	0.07	1.29***	-0.54**	1.45***
	(0.20)	(0.15)	(0.24)	(0.13)	(0.24)	(0.14)
ASC * **Landslide**			**-0.58* (0.30)**		**0.12 (0.19)**	
Buyer has 1 other plot	-0.07	0.23	-0.22	0.23	0.03	0.36
	(0.13)	(0.22)	(0.19)	(0.35)	(0.17)	(0.25)
Buyer has 1 other plot *** Landslide**			**0.35 (0.27)**		**0.20 (0.17)**	
Buyer has no plot	0.12	0.34	0.15	0.19	0.22	0.14
	(0.14)	(0.30)	(0.19)	(0.30)	(0.17)	(0.36)
Buyer has no plot *** Landslide**			**0.05 (0.27)**		**-0.15 (0.17)**	
Buyer is not from this village	0.17	1.34***	0.10	1.17***	0.30**	1.31***
	(0.13)	(0.22)	(0.16)	(0.18)	(0.14)	(0.22)
Buyer is not from this village *** Landslide**			**0.38* (0.22)**		**-0.29** (0.15)**	
Price offered	0.0122***	0.0001	0.0121***	0.0070	0.0139***	0.0007
	(0.0070)	(0.0009)	(0.0070)	(0.0012)	(0.0009)	(0.0010)
To person who is not family nor clan [baseline]						
Buyer has 1 other plot	0.18	0.07	0.01	0.52**	0.11	0.30
	(0.13)	(0.31)	(0.20)	(0.25)	(0.17)	(0.28)
Buyer has 1 other plot *** Landslide**			**0.15 (0.27)**		**0.03 (0.17)**	
Buyer has no plot	-0.00	0.28	0.07	0.33*	-0.07	0.71***
	(.13703)	(0.22)	(0.20)	(0.19)	(0.18)	(0.22)
Buyer has no plot *** Landslide**			**-0.16 (0.27)**		**-0.01 (0.17)**	
Buyer is not from this village	-0.03	0.66***	-0.06	0.50***	0.00	0.57**
	(0.12)	(0.16)	(0.16)	(0.16)	(0.14)	(0.24)
Buyer is not from this village *** Landslide**			**0.09 (0.22)**		**-0.14 (0.14)**	
Price offered	0.0093***	0.0033***	0.0095***	0.0037***	0.0101***	0.0027***
	(0.0006)	(0.0009)	(0.0006)	(0.0007)	(0.0008)	(0.0010)
Opt Out						
ASC	-1.52***	1.58***	-1.31***	1.57***	-2.68***	2.41***
	(0.32)	(0.28)	(0.33)	(0.24)	(0.50)	(0.35)
ASC * Landslide			-0.19 (0.33)		0.19 (0.22)	
Log likelihood	-3603		-3580		-2520	
Chi sq.	4526***		4573***		3655***	
McFadden Pseudo Rsq	0.39		0.40		0.42	
# observations	4232		4232		3136	
	(1058 groups)		(1058 groups)		(784 groups)	

5.3. Marginal rates of substitution

The marginal rates of substitution (MRS) between the different buyer characteristics and price are presented in Table 5. For the full sample there is a clear preference to sell plots to poor members of the extended family who are from the neighbourhood. The difference between the sales price to a family member and the sales price to a person who is neither from the same family or the same clan equals 93% of the average plot price. As an example, if the average plot price (as stated by the respondent) is 3 million Ush/ha, an average respondent would demand 2.8 million Ush more to a buyer who is not from the family or clan than to someone from his/her own family (e.g. 2 million Ush vs. 4.8 million Ush for 1 ha). This is a large difference. When splitting the plots into subsamples depending on whether the plots have ever been affected by landslide, a totally different picture appears. The strong preference to sell to poor families, and the consequential willingness to accept a lower price, does only hold for plots which have never been affected by landslides (Table 5, column 2). Plots with landslides (Table 5, column 3), on the other hand, are not preferentially sold to poor members of the extended family, although members of the extended family are still preferred in general.

Table 4. Marginal Rate of Substitution between various buyer characteristics and the price for the full sample (column 1) and for subsamples of plats that have never been affected by landslides (column 2) and plots that have had a landslide according to the respondent (column 3). The baseline scenario is a buyer who is not from the extended family or clan, has more than 1 plot, is from the same village and offers a 'very low price'. Standard errors are in parentheses (p < 0.10, ** p < 0.05, *** p < 0.01).*

	(1) Full sample	(2) No landslides	(3) Landslides
To Family			
WTA: ASC_F	-93**	-94**	-75**
	(18)	(28)	(21)
WTA: Buyer has 1 other plot	-23	-56**	-1
	(11)	(18)	(13)
WTA: Buyer has no plot	-78**	-106**	-41
	(13)	(20)	(14)
WTA: Buyer is not from this or neighbouring village	31** (10)	23 (15)	26 (12)
To clan member (but not family)			
WTA: ASC_C	22	5	43
	(16)	(24)	(22)
WTA: Buyer has 1 other plot	6	-14	-14
	(11)	(17)	(15)
WTA: Buyer has no plot	-9	-19	-9
	(12)	(17)	(15)
WTA: Buyer is not from this or neighbouring village	-13 (10)	20 (17)	-27 (13)
To person who is family nor clan [baseline]			
WTA: Buyer has 1 other plot	-19	-2	13
	(14)	(20)	(24)
WTA: Buyer has no plot	1	30	7
	(15)	(26)	(19)
WTA: Buyer is not from this or neighbouring village	3 (12)	0 (17)	-2 (17)

5.4. Robustness checks

1.1.1 Interactions with other plot characteristics

Several interaction terms different from landslide occurrence and landslide susceptibility have been tested. Only those yielding significant interaction terms are presented in Table 6, but also non-significant interactions give interesting information. The presence of the homestead, or the presence of perennials on a plot do not influence preferences regarding the characteristics of a potential buyer (not shown). This makes sense, since we are not investigating the actual intentions to sell a plot, but the preferences for a specific buyer characteristics in case of a hypothetical sale. Also the interaction with a dummy for whether the plots has been inherited or received, as opposed to purchased, does not yield significant results (not shown). Preference to keep the land within the extended family is unaltered, while there is a larger preference to sell an inherited or received plots to clan members than to people from outside.

The results of an interaction with a dummy for whether the farmer has the permission to sell the plots without the agreement from family or clan members is presented in column 1 of Table 6. Plots that do not need permission are clearly less preferentially sold to family or clan members. The distance of the plot, on the other hand, does only very slightly reduce preference to sell to family members, but clearly increases preference for family members that are not from the village (Table 6, column 2). This likely reflects the fact that distant plots are likely supervised by members of the extended family living closer to these plots. When responding to the DCE, the farmers therefore likely pictures which member of the extended family might be represented by the hypothetical buyer we present.

Table 6. Results for multinomial mixed logit regression with an interaction between a buyer characteristic and specific plot features. Standard errors are in parentheses (p < 0.10, ** p < 0.05, *** p < 0.01).*

	Column 2: plot feature = dummy for the permission to sell without agreement from clan (1 if yes)		Column 3: plot feature = walking distance from the house (minutes)	
To Family	Coefficient	St. Dev.	Coefficient	St. Dev.
ASC_F	1.79***	1.21***	1.66***	1.20***
	(0.31)	(0.09)	(0.27)	(0.09)
ASC * Plot feature	-0.54** (0.28)		-0.003* (0.002)	
Buyer has 1 other plot	0.15	0.43*	0.26*	0.49*
	(0.17)	(0.26)	(0.13)	(0.26)
Buyer has 1 other plot * **Plot feature**	0.04 (0.23)		-0.002 (0.002)	
Buyer has no plot	0.64***	0.43*	0.54***	0.40
	(0.18)	(0.26)	(0.13)	(0.27)
Buyer has no plot * **Plot feature**	-0.14 (0.23)		0.000 (0.002)	
Buyer not from this village	-0.30**	0.63***	-0.46***	0.61***
	(0.14)	(0.19)	(0.11)	(0.19)
Buyer not from this village * **Plot feature**	0.05 (0.18)		0.004*** (0.001)	
Price offered	0.0273***	0.0046***	0.0273***	0.0045***
	(0.0015)	(0.0010)	(0.0015)	(0.0010)
To clan member (but not family)				
ASC_C	0.42	0.71***	-0.07	0.72***
	(0.31)	(0.11)	(0.28)	(0.11)
ASC * Plot feature	-0.94*** (0.27)		-0.001 (0.002)	
Buyer has 1 other plot	-0.44**	0.06	-0.05	0.02
	(0.19)	(0.23)	(0.14)	(0.23)
Buyer has 1 other plot * **Plot feature**	0.59** (0.24)		-0.001 (0.002)	
Buyer has no plot	0.01	0.14	0.20	0.15
	(0.18)	(0.23)	(0.14)	(0.24)
Buyer has no plot * **Plot feature**	0.32 (0.24)		0.000 (0.002)	
Buyer not from this village	0.16	0.43**	0.17	0.45**
	(0.15)	(0.21)	(0.12)	(0.20)
Buyer not from this village * **Plot feature**	0.12 (0.20)		0.002 (0.001)	
Price offered	0.0317***	0.0017	0.0317***	0.0012
	(0.0016)	(0.0011)	(0.0016)	(0.0011)
To person who is not family nor clan [baseline]				
Buyer has 1 other plot	0.07	0.63***	0.11	0.65***
	(0.21)	(0.24)	(0.16)	(0.23)
Buyer has 1 other plot * **Plot feature**	0.07 (0.26)		-0.000 (0.002)	
Buyer has no plot	0.23	0.53*	-0.014	0.58**
	(0.22)	(0.27)	(0.17)	(0.27)
Buyer has no plot * **Plot feature**	-0.26 (0.27)		0.002 (0.002)	
Buyer not from this village	-0.016	0.66***	0.03	0.66***
	(0.18)	(0.16)	(0.13)	(0.16)
Buyer not from this village * **Plot feature**	-0.04 (0.22)		-0.001 (0.002)	
Price offered	0.0278***	0.0070***	0.0279***	0.0075***
	(0.0017)	(0.0010)	(0.0017)	(0.0010)
Opt Out				
ASC	-0.11	1.62***	-0.00	1.59***
	(0.45)	(0.31)	(0.41)	(0.30)
ASC * Landslide	0.21 (0.33)		0.002 (0.002)	
Log likelihood	-3654		-3658	
Chi sq.	4099		4090	
McFadden Pseudo Rsq	0.36		0.36	
# observations	4232		4232	
	(1058 groups)		(1058 groups)	

1.1.2 Comparison with Likert-scale questions

To our knowledge this study is the first application of a DCE to investigate social norms. In order to evaluate the validity of our result we therefore compare them with the (coarse) information obtained through Likert-scale questions (Table 7). From questions 3 and 4 it is clear that the opinion of family members and clan members matters during land transactions. Even though plots with landslides are generally cheaper (question 2), most farmers say they would reveal the landslide susceptibility of their plot, but more so if this buyer is from the same family or clan and when the buyer is poor (questions 5-9). While there is a slight preference not to sell a plot with landslides to a member of the clan or family (answers on questions 10-11), it is clear that landslide risk does not matter for sales when the potential buyer is considered to be rich (questions 12 and 13). Social (or financial) consequences matter, since farmers tend to agree with question 14, which enquires for the importance of buyer characteristics in case one would leave the village.

Of course, these questions very bluntly ask opinions about social norms and morals, likely strongly suffering from problems related to their hypothetical nature and social desirability bias. We therefore also made sure to ask these questions after the choice experiment in order to not influence our results.

Table 7. Preferences measured with a Likert scale. A bimodal 5-point Likert scale was used (1 = yes, very much/totally agree; 5 = no, not at all/totally disagree). Differences in answers between some questions have been tested with a ttest (p < 0.10, ** p < 0.05, *** p < 0.01). Values with a # or a $ sign have been tested for differences, but are not significantly different from each other.*

Personal preferences regarding landslide risk		
1	I prefer not to buy a plot with landslide risk, even if it is cheaper	1.88 (1.48)
2	In general, plots with landslide risk are cheaper than other plots (all other characteristics being equal)	1.20 (0.63)
Other people's opinions		
3	Regarding decisions about selling and buying of land, what is the importance of the opinion from members of the extended family?	1.38 (0.81) *
4	Regarding decisions about selling and buying of land, what is the importance of the opinion of clan members?	1.35 (0.83)
Sharing information on landslide risk (relation with buyer)		
5	If I would sell a plot of which I know it has a landslide risk, I would tell this information if the buyer was from my extended family	2.07# (1.48)
6	If I would sell a plot of which I know it has a landslide risk, I would tell this information if the buyer was from my clan	2.03# (1.45) ***
7	If I would sell a plot of which I know it has a landslide risk, I would tell this information if the buyer was from a different clan and a different ethnicity	2.76 (1.63)
Sharing information on landslide risk (wealth buyer)		
8	If I would sell a plot of which I know it has a landslide risk, I would tell this information if the buyer was very poor	2.50 (1.61) ***
9	If I would sell a plot of which I know it has a landslide risk, I would tell this information if the buyer was very rich	3.08 (1.76)
Selling a plot with landslides (relation with buyer)		
10	I would NOT sell a plot of which I know there is a landslide risk to a member of my extended family	2.28$ (1.44)
11	I would NOT sell a plot of which I know there is a landslide risk to a person from the same clan	2.23$ (1.41)
Selling a plot with landslides (wealth buyer)		
12	I would NOT sell a plot of which I know there is a landslide risk to a person who is very poor	2.65 (1.49) ***
13	I would NOT sell a plot of which I know there is a landslide risk to a person who is very rich	3.56 (1.56)
14	If I would leave the village after selling my land, the characteristics of the buyer would matter less to me than if I would stay	2.03 (1.30)
N		397

6. Discussion

6.1. Social norms and land transactions

We find clear preferences to sell land to members of the extended family, regardless of landslides susceptibility. Among members of the extended family there is also a clear preference to sell land without landslides to the poorest people[10]. We do not find this preference for land with landslides or for potential buyers from outside the extended family. We interpret these preferences as indications of a social norm regulating land transactions among members of the extended family.

[10] While this might seem to contradict with literature illustrating class matching on the land market (Macours et al., 2010), the situation in our case is different since our finding only applies to land that is being transacted within the extended family.

These findings could also be interpreted as the outcome of a collective insurance arrangement. However, such an interpretation, which has been frequent in neo-classic economics, is not relevant or useful here since evidence has clearly shown that people do not behave as rational self-interested individuals and that social norms play an important role in decision making (Ostrom, 2000).

The strong findings from our choice experiment raise the question as to what extent these norms effectively translate in real life transactions. The large values obtained in Table 5 for marginal rates of substitution between buyers' characteristics and demanded price suggest our results might be driven by the hypothetical nature of the questions and the desire to give a good impression to the interviewer. Yet, since real market interactions are also subjected to the consideration and judgement of members of the extended family, the clan and the neighbours, it is likely that 'social desirability bias' also plays a role in real life transactions. We therefore expect the norms to be applied in real life.

It should be stressed that the observed norm is not necessarily beneficial for the poorer farmers in the village, since they end up having a more restricted access to land than the rich. The social norm aims at avoiding sudden income losses among poor, and consequential needs for support, rather than at limiting poverty or inequality. It is not clear what the long-term consequences of this norm are, and who is gaining from it and who is losing. There is some similarity between the consequences this norm might have at community level and studies that have shown that ex ante risk reduction measures at household level can contribute to poverty traps (Dercon, 1998). Our current analysis does not make use of household fixed effects, because this is not feasible for multinomial random parameter logit models. The problem therefore is that we could be measuring differences between exposed and non-exposed households, rather than differences between susceptible and non-susceptible plots of similar households. This would be a problem for our analysis in case norms differed between exposed and non-exposed households.

Our findings give rise to several interesting research questions. First, given the strongly developing land markets, and the strong integration of coffee and cocoa production in the world market, why did this cultural norm not disappear (like suggested in Devereux (2001))? Cultural traits must be adapted to physical niches (i.e. the presence of landslides), social niches (the strong interdependence in a village context), intra-cultural niches (pre-existing norms) and intercultural niches (arising due to increasing market integration) (Cohen, 2001). The social norm we observe might be a remnant from the past – this does not mean that it is bound to disappear, since hysteresis can be large – or it might fit well in the current socio-cultural context. Increasing market integration is often claimed to go hand in hand with an increasing culture of rational self-interest (Devereux, 2001). Risk reduction behaviour among rational self-interested individuals might, just like the social norm, push vulnerable farmers to acquire less land in landslide prone areas (Mertens and Vranken, 2018). A long-term follow up on the evolution of these norms could bring additional insights here.

Secondly, norms for mutual help or for not selling susceptible land to poor families are of course contested. It would be interesting to investigate the presence of norms and beliefs that ‘serve’ to reduce the obligations towards someone that is affected by a landslide. Interpretations of landslides as being caused by God or spirits to punish bad behaviour, as has been mentioned by some informers in the field, or as events that can be prevented if one takes the right measures on its field, might be ways to evade norms and reduce the responsibilities and burden for community members that are not affected by landslides (Kasper and Mulder, 2015).

Finally, most people in our study area have some members of the family that have left the village. An interesting avenue for further research would be to investigate whether land transactions are different depending on whether the person selling the plot decides to stay in the village or to migrate out of the village. The presence of such a difference would be a measure for the strength of such norms in conditions where deviation from the norm cannot be socially punished.

6.2. A DCE to elicit social norms

We make use of stated choice experiment to elicit preference which are attributed to social norms. We thus investigate the presence of normative behaviour with a methodology, choice experiments, which was developed from a theory, i.e. rational choice theory, which generally does not consider individuals as being embedded in a matrix of society. We believe that this methodology is useful, though, since utility is derived from other factors than material or financial benefits alone and DCE are a useful tool to measure these.

The methodology suffers from the hypothetical bias and social desirability bias, but likely not more than other measures such as questions on Likert scales (Hensher, 2010; Norwood and Lusk, 2011). The advantage of DCE as compared to Likert scale is that the former allow more detailed investigation of complex social norms, e.g. norms only holding for members of the extended family, without bluntly asking many different and complex questions. DCE moreover keeps it fun for the respondents. Further research on the possible applications of DCE is therefore warranted.

The problem of social desirability bias could be further addressed by making use of DCE in inferred valuation exercises. Inferred valuation, where respondents are not asked to say what they would chose, but rather what they think their neighbour would chose, seems an interesting avenue for studying social norms, partially addressing the problem of social desirability bias (Lusk and Norwood, 2009). Yet, such an inferred valuation method could suffer from other problems, like biases resulting from people having a too negative view on others' behaviour (Miller and Ratner, 1998).

7. Conclusion

If the monetary benefit would be the only matter of concerns when selling a plot, we would expect price to be the only significant attribute for determining choices. From our analysis it is clear that social norms play an important role in determining statements about land transactions in our study area. People say that they prefer to sell their plots to family members (and are therefore ready to forego some revenue from the sale) and target poorer buyers as long as the plots are not susceptible to landslides. When the plots are susceptible to landslides, no preference is shown to sell plots to poorer buyers. Our findings illustrate the importance of considering rationales which are different from monetary cost-benefit analyses when investigating the land market dynamics in developing contexts. Including these alternative explanations is necessary to truly understand ongoing dynamics and better predict the evolution and consequences of land transactions. Our findings add new evidence to a recent paper that illustrated that pro-poor norms likely govern land transactions in The Gambia (Beck and Bjerge, 2017). Our results illustrate the benefits, as well as the weaknesses, of discrete choice experiments (DCE) for eliciting preferences that are not easily revealed through market interactions.

8. References

Alesina, A., Giuliano, P., 2011. Preferences for Redistribution, in: Benhabib, J., Bisin, A., Jackson, M.O. (Eds.), Handbook of Social Economics, Volume 1a. Amsterdam, pp. 93–132.

Baland, J.-M., Francois, P., 2005. Commons as insurance and the welfare impact of privatization. J. Public Econ. 89, 211–231. https://doi.org/10.1016/j.jpubeco.2004.02.002

Baland, J., Gaspart, F., Place, F., Platteau, J., 1999. Poverty , Tenure Security , and Access To Land in Central Uganda : the Role of Market and Non-Market.

Baland, J.J., Gaspart, F., Platteau, J.J., Place, F., 2007. The distributive impact of land markets in Uganda. Econ. Dev. … 55, 283–311. https://doi.org/10.1086/508717

Balcombe, K., Burton, M., Rigby, D., 2011. Skew and attribute non-attendance within the Bayesian mixed logit model. J. Environ. Econ. Manage. 62, 446–461. https://doi.org/10.1016/j.jeem.2011.04.004

Basov, S., 2016. Social Norms, Bounded Rationality and Optimal Contracts, Studies in Economic Theory. Springer Singapore, Singapore. https://doi.org/10.1007/978-981-10-1041-5

Beck, U., Bjerge, B., 2017. Pro-poor Land Transfers and the Importance of Land Abundance and Ethnicity in The Gambia. World Dev. 99, 122–140. https://doi.org/10.1016/j.worlddev.2017.07.013

Bourdieu, P., 1994. Un acte désintéressé est-il possible?, in: Raisons Pratiques Sur La Théorie de l'action. Lonrai, France, pp. 149–167.
Brasselle, A.S., Gaspart, F., Platteau, J.P., 2002. Land tenure security and investment incentives: Puzzling evidence from Burkina Faso. J. Dev. Econ. 67, 373–418. https://doi.org/10.1016/S0304-3878(01)00190-0
Buchanan, C.A., 1978. Perceptions of Ethnic Interaction in the East African Interior: The Kitara Complex. Int. J. Afr. Hist. Stud. 11, 410–428.
Burke, M.A., Young, H.P., 2011. Social norms, in: Benhabib, J., Bisin, A., Jackson, M.O. (Eds.), The Handbook of Social Economics, Volume 1a. Amsterdam, pp. 311–338.
Cárdenas, J.C., Carpenter, J.P., 2008. Behavioural Development Economics: Lessons from Field Labs in the Developing World. J. Dev. Stud. 44, 311–338. https://doi.org/10.1080/00220380701848327
Carletto, C., Gourlay, S., Murray, S., Zezza, A., 2016. Cheaper , Faster , and More Than Good Enough Is GPS the New Gold Standard in Land Area Measurement ? World Bank Policy Res. Work. Pap. Ser. 7759.
Caudell, M., Rotolo, T., Grima, M., 2015. Informal lending networks in rural Ethiopia. Soc. Networks 40, 34–42. https://doi.org/10.1016/j.socnet.2014.07.003
Chandler, D., Munday, R., 2011. A Dictionary of Media and Communicatino. Oxford UNiversity Press.
Cohen, D., 2001. Cultural variation: Considerations and implications. Psychol. Bull. 127, 451–471. https://doi.org/10.1037//0033-2909.127.4.451
Colin, J.-P.P., Ayouz, M., 2006. The development of a land market? Insights from Cote d'Ivoire. Land Econ. 82, 404–423.
Day, B., Bateman, I.J., Carson, R.T., Dupont, D., Louviere, J.J., Morimoto, S., Scarpa, R., Wang, P., 2012. Ordering effects and choice set awareness in repeat-response stated preference studies. J. Environ. Econ. Manage. 63, 73–91. https://doi.org/10.1016/j.jeem.2011.09.001
De Weerdt, J., Dercon, S., 2006. Risk-sharing networks and insurance against illness. J. Dev. Econ. 81, 337–356. https://doi.org/10.1016/j.jdeveco.2005.06.009
Deininger, K., Ali, D.A., 2008. Do Overlapping Land Rights Reduce Agricultural Investment? Evidence from Uganda. Am. J. Agric. Econ. 90, 869–882. https://doi.org/10.1111/j.1467-8276.2008.01171.x
Deininger, K., Ali, D.A.A., Alemu, T., 2008. Assessing the Functioning of Land Rental Markets in Ethiopia. Econ. Dev. Cult. Change 57, 67–100. https://doi.org/10.1086/590462
Deininger, K., Castagnini, R., 2006. Incidence and impact of land conflict in Uganda. J. Econ. Behav. Organ. 60, 321–345. https://doi.org/10.1016/j.jebo.2004.04.008
Delpierre, M., Guirkinger, C., Platteau, J.-P., 2012. Risk as Impediment to Privatization? The Role of Collective Fields in Extended Agricultural Households, Department of Economics Working Paper Series.
Dercon, S., 1998. Wealth, risk and activity choice: cattle in Western Tanzania. J. Dev. Econ. 55, 1–42. https://doi.org/10.1016/S0304-3878(97)00054-0
Devereux, S., 2001. Livelihood Insecurity and Social Protection : A Re-Emerging Issue in Rural Development. Dev. Policy Rev. 19, 507–519. https://doi.org/10.1111/1467-7679.00148
Elster, J., 1989. Social Norms and Economic Theory. J. Econ. Perspect. 3, 99–117. https://doi.org/10.1257/jep.3.4.99
Fafchamps, M., 2011. Risk sharing between households. Handb. Soc. Econ. 1, 1255–1279. https://doi.org/10.1016/B978-0-444-53707-2.00007-4

Fafchamps, M., 2003. Rural Poverty, Risk and Development, Center for the Study of African Economies (CSAE).
Fafchamps, M., 1992. Solidarity networks in preindustrial societies: rational peasants with a moral economy. Econ. Dev. Cult. Change 41, 147–174. https://doi.org/10.1086/452001
Fafchamps, M., Lund, S., 2003. Risk-sharing networks in rural Philippines. J. Dev. Econ. 71, 261–287. https://doi.org/10.1016/S0304-3878(03)00029-4
François, A., 2004. Aux fronti{è}res du territoire. Id{é}ologie territoriale et dynamiques fonci{è}res au Busoga (Ouganda). Autrepart 30, 77. https://doi.org/10.3917/autr.030.0077
Frey, B.S., Meier, S., 2004. Testing "Conditional Cooperation" in a Field Experiment. Am. Econ. Rev. 94, 1717–1722.
George A. Akerlof, 1987. Labor Contracts as Partial Gift Exchange. Q. J. Econ. 97, 543–569.
Greene, W.H., 2000. NLOGIT Version 5 Reference Guide.
Grosh, M., Glewwe, P., 2000. Designing household survey questionnaires for Developing Countries.
Hensher, D.A., 2010. Hypothetical bias, choice experiments and willingness to pay. Transp. Res. Part B Methodol. 44, 735–752. https://doi.org/10.1016/j.trb.2009.12.012
Hensher, D.A.D.A., Greene, W.H.W.H., 2003. The mixed logit model: The state of practice. New York 30, 133–176. https://doi.org/10.1023/A:1022558715350
Hess, S., Hensher, D.A., 2010. Using conditioning on observed choices to retrieve individual-specific attribute processing strategies. Transp. Res. Part B Methodol. 44, 781–790. https://doi.org/10.1016/j.trb.2009.12.001
Holden, S.T., Deininger, K., Ghebru, H., 2011. Tenure Insecurity, Gender, Low-cost Land Certification and Land Rental Market Participation in Ethiopia. J. Dev. Stud. 47, 31–47. https://doi.org/10.1080/00220381003706460
Hole, A.R., 2007. Fitting mixed logit models by using maximum simulated likelihood. Stata J. 7, 388–401.
Jacobs, L., Dewitte, O., Poesen, J., Maes, J., Mertens, K., Sekajugo, J., Kervyn, M., 2017. Landslide characteristics and spatial distribution in the Rwenzori Mountains, Uganda. J. African Earth Sci. 1–9. https://doi.org/10.1016/j.jafrearsci.2016.05.013
Kasper, C., Mulder, M.B., 2015. Who Helps and Why ? Cooperative Networks in Mpimbwe. Curr. Anthropol. 56, 701–732. https://doi.org/10.1086/683024
Katz, E.G., Baxter, M., Davis, S., Goldman, M., Melmed-, J., Thiesenhusen, B., Stanley, D., 2000. Social Capital and Natural Capital : A Comparative Analysis of Land Tenure and Natural Resource Management in Guatemala. Land Econ. 76, 114–132.
Kodesh, N., 2008. Networks of knowledge: Clanship and collective well-being in Buganda. J. Afr. Hist. 49, 197–216. https://doi.org/10.1017/S0021853708003629
Krinsky, I., Robb, A.L., 1986a. On Approximating the Statistical Properties of Elasticities. Rev. Econ. Stat. 68, 715–719.
Krinsky, I., Robb, A.L., 1986b. On Approximating the Statistical Properties of Elasticities: A Correction. Rev. Econ. Stat. 72, 1986–1988.
Louviere, J., Hensher, D., 1982. On the Design and Analysis of Simulated Choice or Allocation Experiments in Travel Choice Modelling. Transp. Res. Rec. 11–17.
Lusk, J.L., Norwood, F.B., 2009. An Inferred Valuation Method. Land Econ. 85, 500–514. https://doi.org/10.3368/le.85.3.500
Macours, K., de Janvry, A., Sadoulet, E., Janvry, A. de, Sadoulet, E., 2010. Insecurity of property rights and social matching in the tenancy market. Eur. Econ. Rev. 54, 880–899.

https://doi.org/10.1016/j.euroecorev.2010.02.002
McFadden, D., 1973. Conditional logit analysis of qualitative choice behavior. Front. Econom. https://doi.org/10.1108/eb028592
Mertens, K., Jacobs, L., Maes, J., Kabaseke, C., Maertens, M., Poesen, J., Kervyn, M., Vranken, L., 2016. The direct impact of landslides on household income in tropical regions: A case study from the Rwenzori Mountains in Uganda. Sci. Total Environ. 550, 1032–1043. https://doi.org/10.1016/j.scitotenv.2016.01.171
Mertens, K., Jacobs, L., Maes, J., Poesen, J., Kervyn, M., Vranken, L., 2018. Disaster risk reduction among households exposed to landslide hazard: A crucial role for self-efficacy? Land use policy 75, 77–91. https://doi.org/10.1016/j.landusepol.2018.01.028
Mertens, K., Vranken, L., 2018. Investing in land to change your risk exposure? Land transactions in a landslide prone region. World Dev., BioEconomics Working Paper Series 110, 437–452. https://doi.org/https://doi.org/10.1016/j.worlddev.2018.06.015
Miller, D.T., Ratner, R.K., 1998. The disparity between the actual and assumed power of self-interest. J. Pers. Soc. Psychol. 74, 53–62. https://doi.org/10.1037/0022-3514.74.1.53
Norwood, F.B., Lusk, J.L., 2011. Social desirability bias in real, hypothetical, and inferred valuation experiments. Am. J. Agric. Econ. 93, 528–534. https://doi.org/10.1093/ajae/aaq142
Omura, M., 2008. Property rights and natural resource management incentives: Do transferability and formality matter? Am. J. Agric. Econ. 90, 1143–1155. https://doi.org/10.1111/j.1467-8276.2008.01151.x
Ostrom, E., 2000. Collective Action and the Evolution of Social Norms. J. Econ. Perspect. 14, 137–158. https://doi.org/10.1080/19390459.2014.935173
Pennacini, C., 2007. The Rwenzori Ethnic “Puzzle.” Rwenzori Hist. Cult. an African Mt. 59–97.
Platteau, J.-P., 1994. Behind the market stage where real societies exist - part II: The role of moral norms. J. Dev. Stud. 30, 753–817. https://doi.org/10.1080/00220389408422338
Platteau, J., 1996. The Evolutionary Theory of Land Rights as Applied to Sub-Saharan Africa: A Critical Assessment. Dev. Change 27, 29–86. https://doi.org/10.1111/j.1467-7660.1996.tb00578.x
Polanyi, K., 2001. The Great Transformation, 2nd ed.
Promsopha, G., 2017. Risk-Coping, Land Tenure and Land Markets: an Overview of the Literature. J. Econ. Surv. 00, 1–18. https://doi.org/10.1111/joes.12191
Promsopha, G., 2012. Informal risk-coping and the allocation of farm land. Universit{é} Paris Ouest Nanterre la D{é}fense.
Reuss, A., Titeca, K., 2017. Beyond ethnicity: the violence in Western Uganda and Rwenzori’s 99 problems. Rev. Afr. Polit. Econ. 44, 131–141. https://doi.org/10.1080/03056244.2016.1270928
Revelt, D., Train, K., 1999. Customer-Specific Taste Parameters and Mixed Logit.
Schlager, E., Ostrom, E., 2016. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. Land Econ. 68, 249–262.
Silva, A., Nayga, R.M., Campbell, B.L., Park, J.L., 2011. Revisiting cheap talk with new evidence from a field experiment. J. Agric. Resour. Econ. 36, 280–291.
Sjaastad, E., 2003. Trends in the emergence of agricultural land markets in sub-saharan Africa. Forum Dev. Stud. 30, 5–28. https://doi.org/10.1080/08039410.2003.9666228
Stacey, T., 2003. Tribe: The Hidden History of the Mountains of the Moon.
The World Bank, 2015. Ugandan Purchasing Power Parity [WWW Document]. URL http://data.worldbank.org/indicator/PA.NUS.PPP (accessed 6.16.15).

Train, J.E., 2002. Discrete Choice Methods with Simulation. https://doi.org/10.1017/CBO9780511753930
van Leeuwen, M., 2014. Renegotiating customary tenure reform – Land governance reform and tenure security in Uganda. Land use policy 39, 292–300. https://doi.org/10.1016/j.landusepol.2014.02.007
Willis, J., 1997. Clan and History in Western Uganda : A New Perspective on the Origins of Pastoral Dominance. Int. J. Afr. Hist. Stud. 30, 583–600.
Xenitidou, M., 2014. The Complexity of Social Norms. https://doi.org/10.1007/978-3-319-05308-0
Young, P., 2007. Social Norms, Oxford working paper series. https://doi.org/10.3945/ajcn.113.069443.

9. Appendix A1

1.1.3 Attribute non-attendance

An overview of stated attribute non-attendance is given in Table A1. More than a quarter of the respondents says the origin of the buyer was not taken into account, while 17% of the respondents does not seem to care about the wealth of the buyer. When taking attribute non-attendance into account in the estimation of equations 1 and 2, no differences are found (not shown), suggesting that respondents have been stating attribute non-attendance when actually just not finding these attributes sufficiently important. Given that there are only 4 attributes in this DCE it is unlikely that attribute non-attendance played an important role anyhow (Balcombe et al., 2011; Hess and Hensher, 2010).

Table A1: Overview of stated attribute non-attendance at household level

	Stated attribute non-attendance
Label = relatedness with buyer	0.09
	(0.28)
Wealth status buyer	0.17
	(0.38)
Origin buyer	0.28
	(0.45)
Price	0.06
	(0.23)
N	397