

Female Migration for Marriage: Implications from the Land Reform in Rural Tanzania*

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Abstract

Using the longitudinal household panel data drawn from rural Tanzania (1991-2004), this study investigates impacts of the land reform on women's marriage-motivated relocation. During the period under study, several villages that initially banned a widow's land inheritance abolished this discrimination. Taking a differences-in-differences approach, this study finds that the probability of males marrying in a village increased by altering its customary land inheritance rule in favor of widows. In the light of the traditional system favoring exogamous and patrilocal marriage, this finding indicates that females relocate at marriage in response to the favorable land tenure system at the destination.

Key words: Africa, gender, land ownership, marriage migration, social institution, Tanzania

JEL classification: J12, K11, Q15, R23

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1 INTRODUCTION

While the data on marriage-driven relocation is highly limited, in the developing world, it is common for women to leave their place of origin upon marriage. For example, based on the Tanzania Demographic and Health Survey 2004-2005, approximately 73% of the surveyed females aged 15 to 49 years that resided in a place other than their place of birth were married, in contrast to 56% of those remaining in their place of birth.¹² This mobility seems to have remarkable temporal and spatial welfare impacts on the overall economy, because women work very hard. As this is particularly true for rural societies in the developing world, the movement implies a spatial allocation of productive labor-power, as well as a formation of new production units (Fafchamps and Quisumbing, 2008).³

Despite the apparent significance of female migration and its determinants, this issue remains insufficiently explored. This lack of interest is reflected in the fact that the gender dimension is typically not a central subject of migration research, with the exception of a few conceptual or qualitative case studies (e.g., Chant, 1992; Pedraza, 1991; Pittin, 1984). In addition, family-related female migration tends to be viewed as merely one of the life-cycle events, rather than understood as relocation motivated by the need to enter labor force (e.g., Mulder and Wagner, 1993; Speare Jr. and Goldscheider, 1987). Consequently, female mobility is typically treated as a secondary issue. Finally, even within the marriage-related or gender-related migration research, most extant work focuses on international relocation (e.g., Houston et al., 1984; Lievens, 1999; Ortiz 1996). While interest in women-centered migration research has recently increased, it appears that the primary focus is still job-seeking relocation taking place between countries, leaving an issue of domestic marriage-related migration insufficiently explored (e.g., Martin, 2004; Piper, 2005).

This tendency appears to be much more evident in the field of economics. While several novel contributions have recently been made to the knowledge and understanding of the impacts of female job-seeking immigration on welfare of children left behind (Cortes, forthcoming) as well

¹These figure are unweighted. In order to calculate the true proportion of the entire population from the sample data, appropriate sample weights need to be used. Another example comes from India, where, according to the 1981 Population Census that included 5% of inhabitants, approximately 80 percent of individuals whose residence was different from their place of birth were women, who gave selection of a spouse as the principal reason for their move (Rosenzweig and Stark, 1989).

²It is estimated that internal migrants account for approximately 15-17% of world population, compared to only 2.9% of international migrants (Murison, 2005). According to the United Nations (1993), approximately 50 percent of all internal migrants in developing countries are women, whose decision to move is influenced by factors (a) related to the economic development context and derived mostly from government policies that influence gender-based economic opportunities and constraints in areas of origin and destination; (b) related to institutional factors that, by maintaining gender inequalities, either facilitate or hinder migration; and (c) arising from the socio-cultural system of gender roles and relations that operate in accordance with prevalent norms, values, and expectations.

³In agrarian societies in the developing world, women tend to engage in predominantly domestic activities (e.g., meal preparation, firewood collection, and water fetching), as well as agricultural work. The amount of work women perform often considerably exceeds that expected of males.

as on native women’s time-use decision (Cortés and Pan, 2013; Cortés and Tessada, 2011), the attention to the internal marriage-motivated relocation has still been limited, with only a few exceptions (e.g., Rosenzweig and Stark, 1989; Thadani and Todaro, 1984).

As indicated in Watts (1983-1984), female domestic marriage migration might have been neglected in the scholarly research because such relocation is perceived as a form of movement that has historically existed and is therefore not affected by economic development.⁴ However, a few available studies in this field have indicated that the decision-making pertaining to women’s marriage-motivated relocation is indeed responsive to long-term economic mobility (e.g., Li and Lavelly, 1995). In fact, this responsiveness appears to be more clearly visible when economies undergo marked political as well as institutional changes (Fan and Li, 2012). This is true because such structural changes are likely to yield great spatial heterogeneity, making some areas more attractive to single females. However, the extensive literature review revealed scarcity of rigorous empirical research explicitly demonstrating that female marriage-motivated migration is sensitive to such spatial heterogeneity resulting from the development process. By exploiting a unique setting of the legal reform implemented in rural Tanzania in the 1990s, the current study attempts to fill this knowledge gap.

The decision to select Tanzania for the research stems from two reasons. Firstly, in the region under study, marriage has traditionally been characterized by patrilocal residence and clan exogamy. In this system, when a rural woman marries, she typically leaves her kin to reside with her husband, which often requires relocation outside her natal village. Therefore, it appears that economic conditions at the destination have historically been embedded in the women’s decision-making pertaining to marriage-related relocation. Secondly, the data utilized in this study helps make some causal inferences that are of interest in understanding the motivation behind female migration in this region. The current research uses data drawn from a six-wave long-term household panel survey conducted in the rural region in northwest Tanzania, Kagera (Kagera Health and Development Survey, KHDS). The first four waves were carried out six to seven months apart during the period between 1991 and 1994, whereas the remaining two waves took place in 2004 and 2010, respectively.⁵ This study primarily relies on the data drawn from the first five waves for an empirical analysis, as the community survey was not implemented in wave 6. Historically,

⁴This lack of interest in this phenomenon may be due to the predominant usage of a decision-making model based on a unitary household. See also United Nations (1993) for other reasons behind this apparent lack of interest in female migration within the research community, such as absence of women’s voice in a decision-making process and women’s less significant contribution to producing a monetary income.

⁵Wave 1, September 1991 to May 1992; wave 2, April 1992 to November 1992; wave 3, November 1992 to May 1993; wave 4, June 1993 to January 1994; wave 5, January 2004 to August 2004; wave 6, April 2010 to October 2010.

in rural Tanzania, whether a widow can inherit her late husband's land has depended upon a customary rule imposed by each village, generating some variation in inheritance patterns. As the data suggests, in 1991 (wave 1) some villages customarily prohibited widows from inheriting land. However, by 2004 (wave 5), the discrimination was removed in some areas, following the surge of national excitement about women's land rights that took place in the 1990s.

Given the traditional marital system and the importance of land as a livelihood-producing asset, it is expected that single females in agrarian societies would attempt to marry into a village practicing a favorable land tenure system. Since females relocating into the village have to compete with their local counterparts when seeking their marriage companion, this competition may reduce the cost of getting married for males living in such a progressive village (e.g., search cost, or bride wealth payments from a man to a woman's family, which is another prevailing tradition in this region). As a result, in this study, it is hypothesized that the probability of males marrying is higher in a progressive village. Accordingly, as this paper will show, removing discrimination against widows regarding land inheritance in a village increases the marital probability of local males.

The analysis presented here is based on the data pertaining to the male respondents aged 19 to 30 years in wave 1 and those in the age cohort in wave 5. By showing that the marital probability of males in the age cohort was higher in villages that allowed widows to inherit land compared to those residing in villages that did not, we may be able to provide support for the hypothesis guiding this study. However, this is only true if the inheritance rule was randomly distributed across villages, i.e., not attributed to other socio-economic factors. However, it is certainly possible that the legal system was correlated with unobserved village characteristics, resulting in a biased estimate of interest in the simple cross-sectional comparison. To address this endogeneity, this research takes a differences-in-differences (DID) approach that compares the marital probability of males in the age cohort before (wave 1) and after the legal reform (wave 5) between villages that altered the rule of land inheritance in favor of widows during the period (treatment villages) and all remaining villages (control villages).

By accomplishing the aforementioned aims, this paper contributes to three strands of the extant literature.⁶ Firstly, as already noted, within the field of economics, there is a marked paucity of studies that have empirically explored women's migration in relation to marriage. For instance,

⁶More generally, this research also relates to many development studies, such as those examining impacts of empowering women (e.g., Allendorf, 2007; Duflo, 2012); those exploring effects of reforming a land tenure policy (e.g., Gibson and Gurmu, 2011; Roy, 2012); and those investigating the role of traditional institutions in the process of economic development (e.g., La Ferrara, 2007; Luke and Munshi, 2006).

Rosenzweig and Stark (1989) showed that women’s marriage-motivated migration, which accounted for a significant proportion of migration in rural India, could be seen as an inter-household contractual arrangement, aimed at mitigating income risks, as well as facilitating consumption smoothing. Similar to their study that emphasized the role of risk, by focusing on the land tenure system in rural Tanzania, the current research will highlight the importance of spatial heterogeneity of local attributes as a motivator behind female marriage-driven relocation. Secondly, this study reveals a parallel to the literature sources reporting the link between socio-economic shocks and adjustments in a marriage market (e.g., Gruber, 2004; Peters, 2011; Ueyama and Yamauchi, 2009). This view is taken, as the current study will show that providing widows with a right to inherit land can affect a marital relocation of single females of the current generation. However, this similarity primarily exists in terms of the quantity of matching (i.e., probability), rather than the quality (e.g., hypergamy) due to the limitations imposed by the data analyzed in this study (Abramitzky et al., 2011). Finally, the interest in the manner in which traditional institutions can shape socio-economic outcomes in the modern world has been growing since Munshi and Rosenzweig (2006) conducted their study.⁷ The current study follows this line of research by investigating how reforming the land tenure system influences the pattern of forming marital unions in agrarian societies, where traditions of clan exogamy and patrilocality still prevail.

The remainder of this paper is organized as follows. Section 2 provides institutional background on marital practices and land ownership in Tanzania. An empirical strategy is discussed in Section 3, followed by data overview given in Section 4. The key findings are presented in Section 5. Section 6 discusses the interpretation of the findings, with the conclusions summarized in Section 7.

2 INSTITUTIONAL BACKGROUND

Largely based on the work of Gopal and Salim (1998), Killian (2011) and Rwebangira (1996), this section briefly explains institutional background on marriage, land, rules of land inheritance, and women’s land rights movement in the 1990s.

⁷For example, by exploiting a unique setting of tea plantation in South India, Luke and Munshi (2011) showed that the effects of increased women’s bargaining power within a household, driven by economic globalization, on children’s educational attainment and marriage varied by caste groups.

2.1 Marriage and land

In Tanzania, marriage tends to be patrilocal, whereby, upon marriage a woman moves into her husband's family home. In addition, exogamous marriage, prevalent in much of Sub-Saharan Africa, prevents a man from marrying a woman from his own clan. This combination of patrilocal residence and exogamous marriage often forces a rural wife to move some distance away from her natal village to her husband's home, whereby a customary payment of bride wealth is given to her parents.

Marriage can be seen as a formation of new production unit and rural women, who are responsible for almost all housework (e.g., preparing for food, gathering firewood and carrying water, weeding, sowing and harvesting crops, grinding, pounding and milling grains, and caring for children and ill household members), devote most of their productive time to the unit. Despite women's significant contribution to the family livelihood, historically, males were the sole custodians of matrimonial properties and children, whereby women would often receive minimal rewards from their efforts in their marital relationship. To overcome this disadvantages caused by married women's legal status, the Law of Marriage Act (LMA) was enacted in 1971. This Act secured women's basic rights in marriage and divorce by providing for forms of marriage, minimum age of marriage, separate ownership of properties between spouses during marriage, child custody, and maintenance and division of matrimonial assets upon divorce or separation (Tenga and Peter, 1996). Although customary rules and traditional norms still continue to affect people's attitudes and practices, the enactment of the LMA was seen as a landmark in an attempt to improve women's legal status. However, as the LMA does not govern inheritance of matrimonial properties by widowed women, their inheritance rights are excluded from the protection of this Act.

In contemporary Tanzania, all rights pertaining to land ownership - i.e., 'radical title' - have been vested in the President in trust for the whole nation since the independence. This principle essentially stems from colonial land tenure policies exploited by the British Government (1922-1961), whereby there is no freehold form of land tenure, and landholders possess only leaseholds of a specified duration. Consequently, land matters of the people, such as acquiring, using, disposing of and bequeathing, are taken in the sense of the 'right of occupancy'. Thus, any disputes related to land are initially dealt with at a village council, which has substantial power at the local level, before they come before the primary court (and subsequently the district or high court, in case of an appeal).

2.2 Inheritance law and women's rights

Whilst the picture should not be over-simplified, in Tanzania, the inheritance of estates is primarily governed by three different laws - Customary, Islamic, and Statutory laws. These laws provide for both testate and intestate succession and each of these legal systems is connected by ethnicity and religious affinity. In practice, however, Islamic and Statutory are superseded by Customary Law, which applies to the majority of population living in rural areas.

Customary Law is essentially contained in the Customary Law Declaration Order (CLDO) 1963 (Government Notice No. 436 of 1963), which codifies rules relating to inheritance, although customary practices in the allocation, use, and transfer of land are more flexible than those stipulated in the CLDO. The CLDO applies to patrilineal communities, constituting about 80 percent of Tanzania's ethnic diversity (Rwebangira, 1996, p. 25), in which succession is passed down the male line.⁸

Together with unwritten social rules derived from shared values and traditions in a community, the CLDO discriminates against women with respect to the ownership and control of land, despite the fact that women provide 60 to 80 percent of labor required for farming activities in the country (Kameri-Mbote, 1992, p. 7). With the deceased's first son receiving the greatest share, followed by all the other sons, if any, daughters are least favored in the allocation and inheritance of the clan or family land.⁹ This division is driven by the desire to retain clan or family land within these respective units, as well as the fear that daughters might transfer it to another clan or family when they marry out of their natal village. When no male heir exists, or when land was self-acquired by their late father, daughters have a chance to inherit land, even though this situation is not favored.

Widows are most vulnerable in any property ownership and control, as Rule 27 of the CLDO provides that "a widow has no share of the inheritance if the deceased left relatives of his own clan." Since they receive no resources, they usually have to rely on their children for taking care of them. According to Rule 66A, for example, "(a widow) may claim the right to remain with her issue in a house of the deceased, and thus become one of the deceased's kinsfolk." However, tying a widow's rights to her children's rights in this way does not necessarily protect her, as it invariably brings practical conflicts in case of polygynous marriage and/or when a widow has daughters only. Alternatively, a widow has a right to be inherited to any relative of the deceased as a wife (Rule

⁸The remaining 20 percent is matrilineal, where the unmodified customary rules remain in force. In matrilineal communities, a male heir inherits the property of his maternal uncle, rather than the property of his mother (Rwebangira, 1996, p. 25).

⁹Based upon the CLDO, land can be classified as clan land, family land, and self-acquired land, respectively referring to a piece of land vested in the clan, a piece of land that an individual of the same family lineage held title to in the past, and a piece of land that an individual or family has obtained at the cost of their efforts.

66A). However, this forces her to be dependent on her new family, irrespective of the number of years she has lived with her late husband and the size of her contribution to the wealth of her previous family. Some leniency in the CLDO protects a childless widow by enabling her to enjoy user rights pertaining to land, half of the perennial crops, and right of residence until she remarries or dies. However, this presumes a very rare case in which a married couple keeps a monogamous relationship in face of social pressure to produce an heir. Since a husband usually tends to beget children through polygamy or adultery, it must be difficult for a childless widow to obtain any form of protection.

2.3 Women's land rights movement

The introduction of a multi-party system in 1992 opened up opportunities for women to form independent civil society organizations (CSOs) that brought gender-oriented perspectives in policies and legislation in various spheres.

Regarding women's land rights, a coalition called the Gender Land Task Force (GLTF) emerged in 1997 in the way of challenging the National Land Policy of 1995 and the Land Bill of 1996 that had maintained, though adopted as a result of the government's efforts to introduce legal reforms in a land tenure system, women's disadvantage in accessing and owning land.¹⁰ The GLTF adopted several strategies to lobby for the changes in the Land Bill. The Tanzanian Media Women's Association (TAMWA) that constituted the GLTF, for example, used the media, such as radio, television and newspapers, to inform the public of the deficiencies in the Land Bill. To agitate against a discriminatory customary land tenure system, other member organizations of the GLTF directed campaigns and distributed fliers and bulletins to a variety of stakeholders. Seminars and workshops involving various entities, including government officials, MPs, CSOs, and religious institutions, were also held in many places in the country to support and promote women's land rights movement. Moreover, the GLTF collaborated with another lobbying group, the National Land Forum (NALAF).¹¹ As the primary goal of the NALAF was to empower marginalized groups

¹⁰Before adopting the National Land Policy and the Land Bill, the government formed a Land Commission in 1991, headed by Issa G. Shivji - one of Africa's leading experts on law and development issues - to inquire into a land tenure system in the country. After a thorough investigation of all twenty regions of mainland Tanzania and a couple of neighboring countries, the Land Commission submitted to the President a two-volume report, including a series of recommendations. The essence of the report was to democratize the existing land tenure systems by detaching land ownership and administration from civil servants. The report rejected the radical title currently vested in the President and recommended that land matters should be left to the parliament and village assemblies. The recommendations, therefore, had much potential to create room for people to take part in the administration of land (although these recommendations of the Land Commission did not explicitly address gender issues). However, since the Shivji report strongly criticized a statist top-down institutional structure in land management, many of its recommendations were finally disregarded in the Land Policy and the Land Bill (Manji, 1998).

¹¹The NALAF aimed at pushing for the implementation of Shivji's Land Commission recommendations and was led by Haki Ardhi, a CSO founded by Shivji.

- primarily pastoralists, peasants, children, the disabled and women - by removing the radical title vested in the President, the GLTF and NALAF overlapped in their aims and strategies. Religious organizations were also involved in the movement led by both the GLTF and NALAF. Whilst religious groups had to be very cautious in their actions, as the secular neutrality of the state bans political grouping along religious lines, they also contributed to encouraging a national debate about the Land Bill.¹²

All these movements eventually succeeded in achieving real improvements in the Land Act of 1999 and the Village Land Act of 1999, both characterized by a number of gender-neutral aspects. For example, it is provided that males and females should enjoy equal rights pertaining to acquisition, use and transfer of land. In addition, disposing of land is not allowed without the consent of both (or all) spouses as occupiers. Moreover, both acts override Customary Law, if the latter prohibits marginalized groups, such as women, children, and the disabled, from using, owning, and transferring land.

For these acts to be observed and enforced strictly, however, an appropriate monitoring system is required. Further issues can also arise from the CLDO of 1963, as it has not yet been repealed in spite of numerous discriminatory rules related to land against women. This leaves some ambiguities in applying these acts to real life situations. Moreover, these improvements might not have fully mobilized rural women, who are most affected by customary rules detrimental to them, as many are not sufficiently informed of these legal reforms. Despite the two acts of 1999, it is likely that it takes some time for the effect to be fully realized. Nevertheless, it is true that women's land rights movement flourished in the 1990s and, since then, the ideology must have gradually reached out to the grassroots in a society.

With the support from one of the supervisors of the KHDS project (wave 5) and a local NGO, advocating with and for the rights of older people, in 2012, the author conducted a short questionnaire-based survey in Karagwe - a district in Kagera region. The data collected yielded valuable qualitative information on women's marriage practices that could not be discerned from the KHDS data (see Appendix A for the details). Indeed, this survey revealed that women's awareness of their land rights gradually increased.

¹²Despite its diverse ethnicity and religions, Tanzania is a highly unified country, characterized by harmony and civic peace, due to a number of contributing factors, one of which is the use of one national language, Swahili. In addition, Tanzanian constitution prohibits religious bodies from being a part of activities of the state authority. This secular neutrality of the state might also be another factor.

3 EMPIRICAL STRATEGY

3.1 Specification

As explained in Section 4, the data used in this paper is drawn from the Kagera Health and Development Survey (KHDS), which is a longitudinal household panel survey that consists of six waves, with the first four waves carried out between 1991 and 1994, and the remaining two waves conducted in 2004 and 2010, respectively. The analysis conducted in this study is primarily based on the data drawn from the first five waves pertaining to all the 51 KHDS villages. During the 1991-2004 sample period, the number of villages that allowed women to inherit land following their husband's death significantly increased (from 25 to 44). Assuming that a village having a social rule regarding land inheritance in favor of widows attracts migration of single females into the village with the purpose of marrying males living in the village, which, in turn, reduces the cost of marriage incurred by the males (e.g., search cost, bride wealth payments), it is expected that removing discrimination against widows regarding land inheritance increases the marriage probability of local males.

In wave 5 (1), approximately 48% (39%) of male respondents aged 19 to 30 years residing in villages that allowed for a widow's land inheritance (progressive villages) were married, compared to 33% (28%) of males from villages that did not (regressive villages).¹³ However, the simple cross-sectional comparison of the fraction of married males does not provide evidence that removing discrimination against widows in a village increases the probability of males getting married in the village. It is likely that villages having the rule of land inheritance in favor of widows might have been less discriminatory towards women's rights. For instance, assuming that males living in a village close to a city would opt to postpone marriage due to their exposure to urban lifestyle and values, and that the villagers are more generous with women's rights for the same reason, the cross-sectional comparison will not be able to segregate the effect of allowing for a widow's land inheritance from that of the underlying village-level tastes and preferences for modernity.

To address this issue, this study takes advantage of the fact that the legal reform took place between wave 1 and wave 5 of the survey. Thus, in addition to the cross-sectional comparison of the fraction of married males between the progressive and regressive villages, it is also possible to examine the differences between males that were in the age group before the reform (i.e., wave 1) and those after the reform (i.e., wave 5). For this purpose, an empirical analysis presented in this

¹³See Figure A.1 for the proportion of wedded population by age and sex, based on the data sourced from Tanzania Population and Housing Census 2002. For example, approximately 30% (60%) of males aged 20-24 (25-29) years were formally married or living together with their partners.

paper adopts a differences-in-differences (DID) strategy.

More precisely, pooling data pertaining to male respondents that were aged 19 to 30 years in wave 1 and those in wave 5, in the analysis, the marital status of a male i living in a village j in a period t (wave 1 or 5) is modeled as

$$M_{ijt} = \alpha_1 + \alpha_2 D_{jt} + \alpha_3 \mathbf{x}_{ijt} + \delta_t + v_j + \epsilon_{ijt}, \quad (1)$$

whereby M_{ijt} is a dummy variable, equal to one if the male i was married in the period t and zero otherwise; D_{jt} takes the value of one if it is possible for a widow to customarily inherit land in the period t ; δ_t is an indicator variable, equal to one for the sample males drawn from the wave 5 and zero otherwise; the vector \mathbf{x}_{ijt} contains other controls specific to the male and his original village in the period t ; v_j is a dummy variable for each village; and ϵ_{ijt} represents a stochastic error.

The lower and upper bounds of age stem from the fact that the male study participants aged 19 to 30 years in wave 5 were aged 6 to 17 years in wave 1. In Tanzania, as 18 is the minimum legal marrying age for males, the upper bound ensures that all those male respondents were single in wave 1. Similarly, males under the age of 6 in wave 1 (i.e., under the age of 19 in wave 5) do not reach the marriageable age by wave 5.¹⁴

Given the hypothesis this study aims to test, the α_2 is expected to have positive value. It should be noted, though, that altering the rule of inheritance at the village level will not immediately prompt all local households or individuals to strictly comply with it. Thus, as data does not contain information about the application of the new rule at the household or individual level, the positive α_2 should be regarded as the village-level average of all individual impacts operating at the household or individual level.

Another issue to be recognized in interpreting the estimated α_2 is that the analysis included both the males (aged 19 to 30 years) in wave 5 that stayed in their original villages throughout the sample periods (i.e., non-migrants) and those that migrated out between wave 1 and 5 (i.e., migrants). It may be possible that those migrants might not have taken full advantage of the benefits in a marriage market attributed to the land reform implemented in their natal villages.¹⁵ However, it is also possible that excluding those migrants from the analysis generates bias, if

¹⁴Precisely speaking, males aged 19 years are legally allowed to get married. Using alternative lower bounds (e.g., 18, 17, 16, 15) unaffected implications obtained from the analysis, however. On the other hand, increasing the sample size by lowering the bound from 19 to 18, 17, 16, and 15 resulted in the reduction of the estimated treatment effect. This should be a reasonable finding, because the estimated sample includes a greater proportion of males that were not legally allowed to get married, as the lower bound of age decreases.

¹⁵The KHDS data does not include the information pertaining to specific social rules regarding a widow's land inheritance that was enforced at migrants' destination.

changes in the rule of land inheritance forced males with great (or little) appeal in a marriage market to move out of their original villages.¹⁶ To avoid potential bias that may result from analyzing only the data pertaining to the non-migrants, the estimations performed in this study included the migrants as well. Consequently, the findings should be interpreted as referring to the impact of the legal reform (an intent-to-treat estimate), rather than that of actually enjoying the reform.¹⁷

3.2 Identification: parallel trend assumption

The specification (1) compares changes in the marriage probability of males in the age cohort (19 to 30) from wave 1 to 5 between villages that removed discrimination against widows during the period (21 treatment villages recorded with $D_{j\text{wave } 1} = 0$ and $D_{j\text{wave } 5} = 1$) and all the other villages (30 control villages). A comparison of the marriage probability of the males in the age cohort between wave 1 and wave 5 within the same village is expected to eliminate the effects of time-invariant village-level characteristics. On the other hand, a comparison of the marriage probability between the treatment and control villages within the age cohort would remove the effects of time-varying village-level characteristics that affected these villages over time in similar manner. Note that, as the current study exploits all the KHDS villages, the control group contains villages that were progressive or regressive in both waves.¹⁸ While it may be possible to separate these villages further, this was not done as a part of this study, as the analysis would be overly complex. However, the identification strategy explained below is still valid, as long as the marriage probability in these different types of control villages, as one group, followed the trend identical to that in the treatment villages.

The key identification assumption of the DID strategy is that, in the absence of the changes in the rule of land inheritance, the marriage probability of the young adult males between the treatment and control villages would have followed parallel trends. Thus, the DID approach may still confound the impacts of interest, provided that the treatment and control villages might have experienced different trends in the marital probability during both the pre- and post-reform periods.

¹⁶In addition to this sample selection issue, the migrants cannot be disregarded, given that land rights are likely to affect the migration patterns in a village, which may in turn influence the marriage probability by altering the gender composition of the village population. Regarding this concern, this study estimated the probability of males migrating out between wave 1 and 5, while controlling for their baseline characteristics. However, the exercise did not provide strong support for the hypothesis that the migration rate is significantly affected by the land reform.

¹⁷However, it should be noted that excluding migrants from the analysis yielded the same implications as those obtained from the analysis including them.

¹⁸Of the 30 control villages, 23 allowed for a widow's land inheritance in both wave 1 and wave 5; 5 prohibited the inheritance in both waves; and 2 became regressive regarding a widow's inheritance right from wave 1 to 5.

Unfortunately, as the data prior to wave 1 was not available for analysis, it is difficult to ascertain the marriage probability of young adult males during the pre-reform periods. However, it is still possible to examine the proportion of married respondents in old age cohorts in wave 1, most of whom are likely to have married before wave 1. Figure 1 (left-hand panel) plots the fraction of married males aged 21 years or above in wave 1 for the treatment and control villages. While this proportion is influenced not just by marital formation, but also the dissolution, this exercise may still provide some indication about the pre-reform trends in the marriage probability among young generation. As a matter of fact, similar pattern of marriage probability was observed across age cohorts between the treatment and control villages.

Another check was also performed regarding the pre-reform trend. Given the background information provided in Section 2, the first four waves of the KHDS seem to correspond to the pre-reform periods. Thus, in Figure 2 (left-hand panel), the fraction of married males aged 19 to 30 years in each wave is depicted. A remarkably similar trend was observed between the treatment and control villages in the first four waves. Interestingly, the figure also shows that, in the first four waves of the survey, there was a greater proportion of married males in the control villages compared to the treatment villages, whereas in wave 5, the proportion was higher in the treatment villages.¹⁹ While these checks undoubtedly fall short of providing evidence that rules out the possibility that the DID estimates capture the differences in the pre-reform trend of the marriage probability between those villages, this study may still obtain some comfort from the similarity regarding this issue.

On the other hand, if compared to the control villages, the socio-economic structure in the treatment villages noticeably changed at the time of or after the reform, the estimated α_2 may capture both the treatment effect of interest and the effect of structural changes in the economy. To mitigate this concern, a number of time-varying village-level characteristics were included in \mathbf{x}_{ijt} , relevant to demography (three items of population, ethnicity, religion), mortality (seven items), refugee inflows from Burundi and Rwanda (seven items), natural disasters (three items), and an economy (17 items) (See Appendix B for the details).

The mortality information is crucial because, during the sample periods, the treatment villages might have experienced a greater loss of males relative to females than the control villages did.

¹⁹Figure 2 also shows a substantial increase in the marriage probability from wave 1 to 5. This is primarily due to the difference in the age distribution within the studied population between wave 1 and wave 5. In wave 1, the mean and median values of the age of males aged 19 to 30 years were 23.41 and 23, respectively, whereas the corresponding figures were 24.79 and 25 in wave 5. For females aged 16 to 30 years, those values were 21.38 and 20 in wave 1, increasing to 22.85 and 23 in wave 5. As the sample of KHDS respondents drawn from wave 5 is more skewed towards the age of 30 than those from wave 1, the wave 5 sample is more likely to contain married respondents than the wave 1 sample.

This possibility may contribute to the increase in the marriage probability of the remaining males in the treatment villages by decreasing the male-to-female ratio (relative to the corresponding ratio in the control villages) (Becker, 1981).²⁰ In addition, Kagera has historically been one of the regions most seriously affected by HIV/AIDS in Tanzania. Partly to address these concerns, the analysis uses as regressors a dummy for a village that referred to HIV/AIDS as the most important health problem; the number of people who died in a village in the past 12 months (classified into three age groups - under 15, 15 to 49, and over 50); and the number of children under the age of 15 that did not have their natural parents in a village (grouped according to the parent they lost, i.e., mother only, father only, and both).

During the sample periods, Kagera experienced a great influx of refugees from Burundi (1993) and Rwanda (1994) (e.g., Alix-Garcia and Saah, 2009; Maystadt and Verwimp, forthcoming; Whitaker, 2002). The significant population inflow and all the subsequent events - such as establishment of refugee camps, provision of food aid, implementation of development projects, improvement of health services - and the associated price changes (e.g., food prices, local wages) might have changed the economic advancement prospects among the sample respondents as well as their attractiveness in a marriage market. In order to control for these issues to some extent, the regressors included a dummy for a village that experienced net inflow of population in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5); dummy variables for the presence of dispensary, health center, hospital and daycare center/feeding post; and indicator variables for a village to which people temporarily come from Burundi and Rwanda during certain periods of year to look for jobs.

Despite the evident significance of the refugee settlements, in wave 5, only two of the 51 KHDS villages referred to 'refugees' as the first or second most important disaster that they experienced in the last 10 years. Alternatively, the analysis maintained in the regressors a set of dummy variables for a village that underwent other disasters (flood, drought, epidemic) that were relatively common in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5).

The treatment villages might have experienced economic expansion between 1991 and 2004. As this raises the value of males living in these villages in a marriage market, this economic fluctuation could also be one source of an increase in marital probability of males residing in the treatment villages. Somewhat related to this point, in the period from wave 1 to 5, the treatment villages might also have been better connected with other villages due to an improvement of the

²⁰It is certainly possible that the decrease in the sex-ratio associated with the mortality shocks enabled widows in the treatment villages to obtain a right of land inheritance by increasing women's bargaining power in a village, as females had to control land due to a greater number of male deaths.

village infrastructure (e.g., transportation system), which expanded the marriage market beyond the village borders. This improvement of the village facilities may also result in a greater number of marital matches in the treatment villages compared to the control villages. As potential factors reflecting these perspectives, several village-level characteristics were also included in \mathbf{x}_{ijt} , such as indicator variables for the existence of a drinking bar/restaurant; a daily market; motorable roads; electricity/generators; pipe-borne water; a post office/public phone; a bank; and whether public transportation passed by a village.

While the concern of the parallel trend is clearly a limitation to be admitted, the assumption may find some consolation in controlling for these time-varying characteristics in each village.

[Here, Figures 1 and 2]

4 DATA

The KHDS was initiated in the rural region in northwest Tanzania, Kagera, as a part of a research project on adult mortality in Sub-Saharan Africa, launched by the World Bank in 1991. With 912 households drawn from the 1988 Tanzanian Census, whereby stratification was based on geography and mortality risk, the first four surveys were conducted between 1991 and 1994 with 6- or 7-month intervals between consecutive waves.^{21,22} In 2004, about 10 years after completion of wave 4, approximately 91% of those 912 baseline households were recontacted (wave 5). In addition to the contact with the original households, when the previously surveyed family members resided outside their original households or villages, their new households were also traced. Contacting both the original and new households resulted in 2719 household surveys in wave 5, arising from successfully recontacting 832 of the 912 original households. Only half of these 2719 households remained in the village they resided in 10 years previously, suggesting a substantial demographic mobility in this region during one decade.

While the KHDS is a household panel survey, it facilitated constructing unbalanced panel data

²¹Applying the stratification based on geography and mortality risk, the KHDS sample households were randomly selected in two stages, whereby village selection was followed by the selection of households. In the first stage, 550 geographical areas delineated by the 1988 Tanzanian Census were initially classified into eight strata defined over four agronomic zones and the level of adult mortality (high and low) in each zone. Next, six or seven villages were selected from each stratum. See *User's Guide to the Kagera Health and Development Survey Datasets* (2004) and *Kagera Health and Development Survey 2004 – Basic Information Document* (2006) for more detailed description of the sampling design. As this sampling strategy caused households classified as at a high risk of adult death to be over-represented, the results of the subsequent analysis should be treated with caution when attempting to generalize them.

²²As the sample KHDS villages are located a great distance from each other, the KHDS covered the entire region of Kagera. More specifically, the average distance between any two of the KHDS villages is approximately 88 kilometers, with the standard deviation of 68. See also *User's Guide to the Kagera Health and Development Survey Datasets* (2004, p. 9) for the visual identification.

from wave 1 to 5 at the individual level, as it provided the information for all household members in all waves. The attrition rate in the KHDS is very low even on an individual basis. Based upon the careful examination of sample attrition by Beegle et al. (2011), excluding individuals that died, approximately 82% of the 5394 original respondents that were interviewed in the first four waves were successfully recontacted in wave 5. This significantly high recontact rate is one of many successes and contributions of this long-term panel survey. In addition, as throughout the waves, a standardized survey questionnaire was used (although several changes were made in wave 5), the information obtained is highly comparable across the waves. Moreover, the data contains a variety of information related to a household, its members, and a village from which sample households were chosen, making the KHDS highly valuable resource for an empirical study.

4.1 Marriage and migration

Before providing summary statistics, the relationship between marriage and migration was overviewed by gender. Firstly, the reason for migration is reported in Table 1, where the first two columns represent data pertaining to migration that took place between wave 1 and wave 5, and the last two columns indicate individuals that moved into a surveyed village prior to wave 1. In accordance with the preconception that women typically relocate at marriage in most of the Sub-Saharan Africa region, almost half of female migration in this sample was driven by marriage. On the other hand, male migration was hardly related to marriage. Next, Table 2 reports marital status in wave 5 of men and women that were single in wave 1, in order to establish whether their status varies by relocation. While about 64% of females that migrated out between since wave 1 were married in wave 5, the corresponding figure for female non-migrants was just 19%. This discrepancy between migrants and non-migrants confirms presence of strong correlation between women's marriage and migration. On the other hand, there is almost no difference in the proportion of married male migrants and non-migrants in wave 5, as in both groups approximately 37% were married in wave 5. This difference in the relationship between marriage and migration by gender is formally evaluated by estimating the linear probability of being married in wave 5, using a model that includes a migration dummy between wave 1 and wave 5 by OLS in Table A.1. The results indicate that, whilst female marital status in wave 5 positively and significantly correlates with migration, the correlation is insignificantly different from zero for males.

[Here, Tables 1 and 2]

4.2 Summary statistics

To assess whether males in the control villages are a suitable control group for those in the treatment villages, the equality of the mean between these two groups was assessed in each wave, with the key variables summarized in Table 3. The mean values are reported at the individual and village-level in the panel (A) and (B), respectively. Table A.2 also reports on the checks performed in order to test whether changes in the mean value of those variables from wave 1 to 5 were statistically equal between the treatment and control villages (i.e., DID estimates). Moreover, a similar comparison of those variables between the progressive and regressive villages in each wave was also made, and the results are presented in Table A.3.

A few observations are worth noting here before proceeding with further analysis. Firstly, a great number of villages altered the rule of land inheritance between 1991 and 2004 (see Table A.3). While only half of the sample villages allowed widows to inherit land in wave 1, approximately 86% of them did so in wave 5.

Secondly, the number of observations at the individual level considerably increased from wave 1 to 5. Given that male study participants aged 19 to 30 years in each wave were analyzed here, this may be consistent with the growth of population observed in the surveyed villages.

As seen in Table 3, both the individual and village-level characteristics were relatively well-balanced between the treatment and control villages in both waves (1 and 5). However, the DID estimates shown in Table A.2 revealed significant differences in the changes noted in several variables. For example, consistent with the hypothesis guiding this study, the marriage probability of males aged 19 to 30 years increased in the treatment villages more prominently than that in the control villages. In addition, some mortality shocks that might have been associated with the spread of HIV/AIDS affected the treatment and control villages differently, although the interpretation of this variation could not be clearly established from the estimates. In order to give the identification assumption more credibility, all these village-level characteristics were considered in the estimation with a control of the village-fixed effects, as well as a time-trend that equally affected the marital probability between these villages over time.²³

²³In contrast to the well-balanced observed characteristics between the treatment and control villages in particular waves, it appears that the progressive villages were significantly different from the regressive villages. For instance, based on Table A.3, in wave 1, in comparison to the regressive villages, the progressive villages were more likely to have had a drinking bar/restaurant, a daily market, electricity/generators, pipe-borne water, and a bank, although not all the differences were statistically significant. On the other hand, as seen in Table 3, only a few significant differences arose from the observed characteristics between the treatment and control villages in wave 1. This observation - combined with the fact that the control villages (30 villages) in the current analysis contain villages that were already progressive in wave 1 (25 villages) as well as those that were regressive throughout all the waves (5 villages) - indicates that the treatment villages (21 villages) might have been more developed and modernized at baseline, compared to the five control villages that were regressive in wave 1.

[Here, Table 3]

5 ESTIMATION RESULTS

5.1 Main results

Pooling sample villages into six districts (Biharamulo, Bukoba Rural, Bukoba Urban, Muleba, Ngara, and Karagwe), column (a) in Table 4 reports the OLS estimation results of the equation (1) with the district-fixed effects. While having the rule of land inheritance in favor of widows was positively correlated with the marriage probability of males aged 19 to 30 years in a village, the impact was small and insignificantly different from zero. However, the estimate may be biased towards zero, because, for example, it is certainly possible that males living in a village located in close proximity to cities are supportive of women’s rights, and may choose to marry late due to their exposure to the urban culture. In line with this conjecture, replacing the district-fixed effects with village-fixed effects in column (b) considerably raised the magnitude of the treatment effect that was statistically significant at a one percent level. This contrast between the results of the analyses exploiting the district- and village-fixed effects provides an indication that controlling for unobserved time-invariant village characteristics is indeed crucial for the identification of interest. The probit estimation result presented in column (c) revealed similar implication to that obtained in column (b). These findings suggest that allowing for a widow’s land inheritance in a village increased the probability of males in the age cohort marrying in the village by approximately 20 percentage points.

5.2 Robustness checks

5.2.1 Land or something else?

One potential concern for the results is that a widow’s land inheritance right may, in fact, be a proxy for an improvement of women’s access to other properties, which makes it difficult to attribute an increase in the marital probability of males in the treatment villages solely to the improvement of a widow’s land rights. This issue is further discussed below.

It is beneficial that the KHDS collected information on a village custom regarding a widow’s inheritance right to house and other property that could additionally be included in regressors. However, the inheritance rules of land and house revealed extremely high positive correlation (see

Table A.4). In fact, of the 51 KHDS villages, only two (three) villages applied different inheritance rules to land and house in wave 1 (5).²⁴ From theoretical perspective, exploiting an additional regressor that is highly correlated with a variable that is already included in the estimation reduces the precision of point estimates (as long as the additional inclusion does not increase explanatory power of the empirical model) without changing the consistency. However, a rule of thumb provides the informal guidance that, when regressors include two highly and positively correlated variables, one tends to overestimate one parameter as well as underestimate the other (Williams, 2013). In order to avoid this issue, in this study, no attempt was made to segregate the effects of land inheritance and house inheritance. Instead, the analysis presented in column (d) of Table 4 that estimated equation (1) exploited a dummy for a village that allowed for a widow’s house inheritance as an alternative measure for a widow’s land inheritance. Further proxies for the rule of land inheritance were used in columns (e) and (f) of Table 4. More specifically, an indicator was set to the value of one if a village allowed widows to inherit (e) both land and house, and (f) either land or house. The estimated impacts of the legal reform in all these cases revealed a similar pattern to that obtained in column (b). Finally, the analysis presented in column (g) simultaneously used the inheritance rules pertaining to both land and house. Compared to the results in columns (b) and (d), the estimated land effect was overestimated, whereas the house effect was underestimated (and negative). The standard errors also increased with the R-squared kept constant. These observations were indeed consistent with the aforementioned statistical guidelines.

In contrast to the rule of house inheritance, that pertaining to other property (not specifically identified in the questionnaire) revealed weak correlation with the rule of land inheritance (see Table A.4). Thus, in the current analysis, the rules of land and other property were simultaneously controlled for. The finding is reported in column (h) of Table 4. Somewhat unexpectedly, the inheritance rule of other property had no significant association with the marital probability, although the land effect was still significant, maintaining similar magnitude to that presented in the previous columns.

5.2.2 Measurement concern

However, it should also be noted that these rules were recorded based on the responses to community questionnaires that were distributed only to a group of leaders in a village. More specifically, these answers pertained to the question of whether a wife could customarily inherit these assets in

²⁴It is surprising that the rule of house inheritance did not perfectly coincide with that governing land inheritance, as houses and (banana-producing) land are usually on the same premises in most households in this region.

the event of her husband’s death. As this information was used in this study as an indication of the applicability of these rules, the measured customary rules may be subject to noise. This concern may also arise from the fact that the leaders in several villages changed their answers several times within the first four waves.²⁵ While Peterman (2011) provides support for the view that observed variation in inheritance rules in the KHDS data is informative for an empirical analysis, the measurement concern still deserves examining more carefully.²⁶

Regarding this issue, the KHDS provided data (age, gender, years in a village) on the person who was responsible for answering the question pertaining to the inheritance custom.²⁷ In the analysis reported in columns (i) and (j) of Table 4, this information was incorporated as additional regressors, with or without the inheritance rule of other property. Firstly, the estimated impacts of land inheritance were unaffected by the implementation. Secondly, and in contrast to the result given in column (h), the estimation presented in column (j) now identified positive and (weakly) significant effect of other property, which is an intuitive finding. Interestingly, including the additional rule of other property in column (j) eliminated the significance of several characteristics of the responsible person identified in column (i). These observations may suggest that the survey response regarding other property was sensitive to who was responsible for answering the question.

5.2.3 Refugees from Burundi and Rwanda

While several time-varying village-level controls were included in the estimations, the refugee settlements from Burundi and Rwanda that were described in subsection 3.2 may be worth more consideration due to the evident significance of the event. The KHDS project provided information on a village’s distance from the major 13 refugee camps that were constructed in those days.²⁸ In this study, the number of the camps that were situated within the 25 km radius from each KHDS village was recorded and used as one measure that might reflect the influence of the event. In the analysis presented in column (k) of Table 4, equation (1) was estimated by OLS, including the aforementioned number interacted with the inheritance rule of land. While the fact

²⁵This inconsistency may be attributed to measurement noise that is associated with misunderstanding the question and/or need to provide socially desirable response. Alternatively, it may be due to the irresponsibility of the respondent in answering the question. On the other hand, it is also possible that the answer might contain elements of the leaders’ anticipation and uncertainty with respect to the upcoming changes in the inheritance rule under the land tenure reforms. Furthermore, the inconsistency in responses between the consecutive waves might have been due to different village leaders partaking in the community survey in the consecutive waves.

²⁶By using the same information as the current study, Peterman investigated the effects of a widow’s property and inheritance rights on labor force participation and earnings of women aged 15 to 55 years at baseline. In her preferred model that controls for an individual’s fixed effects and sample attrition, Peterman found that securing widows’ rights resulted in an increase in women’s employment opportunities outside home, as well as their earnings.

²⁷The name and occupation of this individual was not provided as a part of this public record.

²⁸The 13 refugee camps are Benaco, Burigi, Chabalisa, Kagenyi, Keza, Kitalli, Lukole A, Lukole B, Mbuba, Musuhura, Mwisa, Omukariro, and Rubwera. The information on the distance is available from <http://www.edi-africa.com/research/khds/introduction.htm> due to contribution made by Jean-François Maystadt.

that the number is time-invariant prevents the current analysis from segregating the level effect (of the existence of the camps) from the village-fixed effects, it is still possible to examine whether the land right effect varies with the influence of the refugee inflow. The finding, however, did not support the presence of such heterogeneity. Using 50 km radius instead of 25, as the alternative criterion, did not alter the implication.

5.2.4 Bride prices

An increase in marital prospects of males originating from the treatment villages is likely to be associated with the reduction in the cost of marriage incurred by those males. One such cost is bride wealth payment from a man to a woman's family.

The KHDS wave 6 conducted in 2010 collected detailed information on the transactions of both cash and in-kind payments made by a groom, his family and other relatives to a bride's family. Restricting the sample to males that were married in wave 5, the analysis in column (1) to (n) in Table 4 regressed the amount on covariates evaluated at the point of wave 5. As the information on the bride prices was provided only by panel respondents who were less than 17 years old at baseline, the age of the respondents used in those estimations ranged from 18 to 30 years in wave 5. Indeed, this group is the main target of the current study.

Before providing a description of the results, several caveats must be expressed with respect to their interpretation. Firstly, as the analysis focused solely on the cross-sectional variation in the data, it was impossible to control for the village-fixed effects. In a developed and modernized village that had adopted the favorable inheritance system, for example, the bride wealth payment might have been a relatively outdated custom. In this case, the inability to control for the unobserved village-level characteristics may generate negative bias on the influence of the inheritance rule on the payment amount. Secondly, while the reduction in the cost of marriage indicates negative relationship between the payment and the inheritance rule, the correlation is also consistent with an issue of sample selection. Removing discrimination against widows might have enabled males who had not previously been particularly attractive marriage candidates to obtain a wife by offering a right to inherit land to women. If those males were less appealing before because they could not afford to make the bride wealth payments, the estimated married sample in the progressive villages may include a greater proportion of males that were financially constrained than the corresponding sample in the regressive villages. For these reasons, these exercises should be interpreted as providing only suggestive evidence.

As anticipated, the result presented in column (1) revealed a negative association between the

rule of land inheritance and the bride wealth payment at a 14% significance level. The analysis given in column (m) additionally included the inheritance rule applicable to other property. In the KHDS 2004 (wave 5), the village leaders were also asked to provide information on whether it was common for a widow to be inherited as a wife by the brother or other male relative of the deceased. This practice is called wife/widow inheritance that may be a social safety net provided for widows. An indicator for the presence of this practice was also exploited in the estimation in column (n). As expected, the estimated impacts of these rules were negative. In column (n), for example, having the rule of land inheritance in favor of widows in a village was, with one percent significance, associated with the reduction in bride prices by 99000 Tanzanian shilling (TZS) - equivalent to about 66 US dollars, based on the exchange rate in December, 2010. As the mean value of the payment in the estimated sample was approximately 114000 TZS, the reduction is remarkably large.

[Here, Table 4]

6 IMPLICATIONS FOR WOMEN

Thus far, the current study findings have shown that allowing women living in a village to inherit land upon their husband's death increases the marital probability of males living in the village. While the findings regarding the amount of bride prices are only suggestive, these are also likely to be lower in progressive villages than in those that do not allow for a widow's land inheritance. One interpretation of these findings is that, given female relocation at marriage, a 'decision maker' on the bride's side (whether the bride, her parents, or other relevant parties) would likely prefer her to 'marry into' the progressive villages, as the decision maker would benefit from the land-related (expected) 'utility gains'. However, given that the previous analysis focused solely on the male respondents' data, interpreting the findings in this way may be overly simplistic. This section thus provides some discussions relevant to these aspects.

6.1 Who made a decision?

As explained before, though it was not based on random sampling, the author conducted a short questionnaire-based survey in Karagwe in 2012 (see Appendix A for the details). The information provided by the female respondents that entered into marriage between 1991 and 2004 revealed several interesting observations about the process of marital formation in the surveyed area. Firstly,

marriages formally arranged by a groom and a bride's parents hardly existed during the KHDS sample periods. Secondly, while 17 of the 36 female respondents asked for an approval from several family members before accepting the marriage proposal, it appeared that those members rarely prevented women from choosing a husband that they liked.²⁹ In addition, in those days, women would often receive many proposals - the interviewed women reported minimum of two and maximum exceeding 20 - from both the neighboring and distant villages. Thus, it was usual for females to refuse an unwanted offer of marriage.

Based on the KHDS 2010 (wave 6), approximately 75% of all marriage cases reported by the panel respondents under the age of 17 at baseline were identified as 'informal', whereby a couple would start living together and, after a certain period of time, would approach the relevant family members to formalize the marital arrangement. In this type of marriage, it was common for grooms to pay a 'fine' for taking a bride without her family's consent, which was considered as one type of bride wealth payments in the analysis made in subsection 5.2.4.

All these observations suggest that a couple (and a bride herself) had a certain degree of power and autonomy in spouse selection. However, this is only suggestive, and it is still possible that her relatives, particularly close ones such as parents, uncle/aunt, and brother/sister, had some influence on the marital decision.

6.2 Impacts on female marriage

The interpretation of the female relocation to the progressive villages is based on the presumption that, upon marriage, a rural woman typically leaves her kin to reside with her husband living outside her natal village. Given this consideration, if all women marry out of their natal village and their decision to marry is primarily affected by living conditions at the *destination*, altering the rule of land inheritance in their *original* village may not influence their marital probability at all. On the other hand, if not all women marry out of their natal village, allowing a widow to inherit land in a village may intensify competition in the local marriage market by attracting single females from outside the village. Consequently, local women may experience difficulty in marrying in their natal village. The aforementioned arguments suggest that allowing a widow to inherit land in a village would have non-positive impacts on female marriage prospects in the village.

Given that the minimum legal age of marriage for females is 15, the analysis presented in columns (a) and (b) of Table 5 estimated equation (1) for female respondents aged 16 to 30 years,

²⁹Based on the 17 answers, the members that were commonly consulted were mother, father, biological brother, aunt, and uncle.

by using either linear probability or probit models. Again, the DID approach needs to assume that the treatment and control villages experienced a similar pre-reform trend in the marital probability, which was, similarly to the case of the male sample, confirmed in Figures 1 and 2 (right-hand panels). As anticipated, the results showed that the effect of removing discrimination against widows regarding land inheritance in a village, while negative, was statistically insignificant.

6.3 Does the rule matter before or after a husband's death?

Utility gains associated with the favorable inheritance rule at the destination may be realized while a husband is alive, as well as after his death. For example, even in the presence of a husband, women in the progressive villages may be able to enjoy a greater part of agricultural income than that acquired by those residing in the regressive villages.³⁰ However, it may be relatively straightforward to anticipate that the gains become more apparent after the husband's death, because the legal system particularly allows *widows* to inherit land. For instance, given the historical vulnerability of a widow's social position described in subsection 2.2, in the progressive villages, females might have obtained social protection in their widowhood.³¹

In order to verify that the utility gains emerge (at least, in part) after a husband's death, one informal check was performed, by noting that, in such a case, the inheritance rule may play a more important role when a husband is more likely to die. The exercise interacted the inheritance rule with several pieces of mortality-related information in columns (c) to (e) of Table 5. Based on the result presented in column (c), an increase in the marriage probability of young males resulting from the legal reform was more evident in a village that referred to HIV/AIDS as the most important health problem.³² This finding is consistent with the expectation because the prevalence of HIV/AIDS seemed to be associated with the likelihood of a husband's death (Beegle, 2005; Beegle

³⁰Moreover, in the progressive villages, it may also be possible for women to leave land to their daughter in their will. As women are likely concerned with the welfare of their daughters, this future benefit pertaining to their daughters' welfare may motivate women to marry into the progressive villages.

³¹Figure A.1 presents the proportion of wedded population by age and sex, based upon data sourced from Tanzania Population and Housing Census 2002. For example, approximately 24% of females aged 15-19 years were formally married or cohabiting with their partners, in contrast to the corresponding figure of 3% for males, suggesting that women marry younger than males do. However, there were fewer females aged 35 years or above that were in the wedded relationship compared to males, indicating that women's separation from their husbands starts around that age and may partly be driven by a husband's early death (often due to age differences between spouses and/or sexually transmitted diseases (STDs)). In 1996, in Tanzania, a husband was typically older than his wife by 8-10 years (Westoff, 2003). Combining these findings with women's life expectancy at birth, which was 51.04 years in 2002 (National Bureau of Statistics, 2006), and the median age at first marriage among women aged 20-49 years, 18.3 years in 2004-2005 (National Bureau of Statistics and ORC Macro, 2005), it appears that women must anticipate relatively long periods of widowhood when they marry.

³²When interpreting these findings, it should be noted that the HIV/AIDS-related measure may include some noise. This noise may arise from the possibility that taking the incubation period for AIDS into account, the HIV prevalence in the past (e.g., ten years ago) might have been a more appropriate consideration of the current marriage candidates than the recent prevalence. However, if those measurement errors are classical, they would not seriously alter the implications, because in that case, the estimated impact may solely be attenuated.

et al., 2008).³³ The analysis presented in column (d) replaced the HIV/AIDS information with more direct measures of the adult mortality, i.e., the number of individuals aged 15 to 49 years, or aged 50 years or above, who died in the past 12 months in a village. The finding indicates that the land right effect was indeed sensitive to the adult mortality. Interestingly, in this column, the coefficient associated with the level effect of the legal reform was reduced by more than half, compared to that given in column (b) of Table 4 (0.178 to 0.072). Including the mortality information of all the age groups as well as of the HIV/AIDS in column (e) made the previously identified impact of HIV/AIDS (interacted with the rule of land inheritance) insignificant, suggesting the effectiveness of the direct measures. The finding not only yielded similar implication to that obtained in the column (d) but also suggested that the (particularly, prime-age) adult mortality, rather than the child one, at the destination was an important consideration of female relocation at marriage in responding to the legal reform.

In addition to these findings, the prevalence of HIV/AIDS was significantly negatively correlated with the probability of males getting married. Similar to the study that Ueyama and Yamauchi (2009) conducted in the context of Malawi, it may be possible to interpret this finding as women's selective marriage-motivated relocation to avoid HIV infection at the destination.³⁵ However, as opposed to this interpretation, the direct measures of the mortality had significant and positive relationship with the probability. As this relationship was observed conditional on the prevalence of HIV/AIDS, this finding may reflect demand for females that compensate for the lack of physical labor that takes care of ill household members, as well as makes agricultural production.

While all these results are only suggestive due to the potential endogeneity of the mortality information, it appears that the utility gains resulting from the legal reform are, in part, associated with the concern over a husband's death.

[Here, Table 5]

³³Beegle (2005) used the data drawn from the first four waves of the KHDS to investigate how prime-age (15-50) adult mortality (past and future) affected the time allocation of household members. In a similar vein, the impact of adult mortality shocks on the consumption growth of household members was also investigated by using the full KHDS dataset (Beegle et al., 2008).

³⁴Another interpretation for the positive impact of the interaction term between HIV/AIDS and the rule of land inheritance may also be possible. For example, males that survived in areas seriously affected by HIV/AIDS might have seemingly been 'safe' as marital and sexual partners, because they were alive despite the prevalence. In such cases, both the favorable inheritance rule at the destination and the expected low infection risk might have contributed to the increase in the marriage probability. However, in this case, the HIV prevalence itself (i.e., level effect) is also likely to increase the marriage probability. As explained in the next paragraph, however, this was not the case.

³⁵Ueyama and Yamauchi (2009) showed that, in Malawi, an increase in mortality among prime-age adult population lowered women's age at marriage and authors interpreted this finding as women's attempt to avoid HIV infection associated with pre-marital sexual intercourse.

7 CONCLUSION

By focusing on the implications of the land reform implemented in rural Tanzania for local marriage practices, this study investigated whether female relocation at marriage was responsive to the institutional heterogeneity across spaces. More specifically, given the female relocation characterized by clan exogamy and patrilocality, it was expected that females attempted to marry into villages that had a land tenure system in favor of widows. Since such female relocation might have prompted competition among local females that, in turn, might have reduced the cost of marriage incurred by males living in the progressive villages (e.g., search cost, bride prices, etc.), analyses were performed in order to ascertain whether the marital probability of males residing in the progressive villages was higher, compared to those living in the regressive villages.

Controlling for the endogeneity associated with the rule of land inheritance was the hardest empirical task, because the rule appeared not to be randomly assigned across villages. This research exploited a unique setting, based on the data drawn for the 1991-2004 period, during which several villages that initially banned widows from inheriting land eliminated this discrimination. Taking the DID approach, this study provided evidence in support of the hypothesis that making it possible for widows to inherit land in a village increased the marital probability of local males.³⁶

The findings reported here may provide one policy implication relevant to the practitioners challenging several traditional marital practices (e.g., early marriage, polygamy) often observed in Sub-Saharan Africa. As the current study showed that a marriage market operated across neighboring villages, any potential policy interventions aimed at addressing those issues should be spatially extensive, although an optimal geographical scope of those interventions could not be established in this study.

On the other hand, a few reservations should also be expressed with respect to the findings reported here. The DID approach relies on the assumption that changes of village-level characteristics, other than the legal reform, similarly affected the marital probability of males in both the treatment and control villages during both the pre- and post-reform periods. However, it might have been possible that some time-varying shocks affected those villages asymmetrically. While an attempt was made to control for such potential socio-economic shocks, it may still be doubtful

³⁶However, several adjustments in a marriage market may eventually eliminate (or might have eliminated) differences in the marital probability of males between the progressive and regressive villages. For example, males in the regressive villages may try to attract single females by offering additional resources (e.g., bride prices), or credibly promising to allocate more of (divisible) marital outputs to potential spouses in a marriage market (transferable utility model). Similarly, if such resource transfer is not feasible (non-transferable utility model), those males in the regressive villages may attempt to invest in themselves in order to be perceived as more attractive in a marriage market (Peters and Siow, 2002). Furthermore, the regressive villages might have removed discrimination against widows after wave 5.

that the empirical results are entirely free from endogeneity bias. In addition, the extremely high correlation between inheritance rules applicable to land and house made it difficult for the current study to segregate their impacts. Consequently, its findings will have to be interpreted with these qualifications in mind. However, this investigation still sheds light on the issue of women's marriage migration that might have been long out of the headlines of migration studies. Combining this evidence with the qualitative information the author collected in the surveyed area specifically for the purpose of this study, it may be surmised that women's relocation at marriage is quite strategic.

A APPENDIX: FINDINGS FROM A QUALITATIVE SURVEY

For the hypothesis tested in this paper to be plausible, it must be assumed that the characteristics of destination villages are well known to women that are about to marry. This subsection reports on checks performed in order to verify the assumption.³⁷

With a support from one of the supervisors of the KHDS project (wave 5) and a local NGO advocating with and for the rights of older people, in 2012, the author conducted a short questionnaire-based survey in Karagwe - one district in Kagera region. After stratifying the district into five groups of wards by characteristics of population (ethnicity, wealth, etc.), based upon conversations with the NGO, this survey selected at least one village from the respective group, resulting in seven villages, randomly drawn from a list of 114 villages existing in the district.³⁸ In each village, the author asked 5 or 6 females aged 30 to 40 years about the manner in which their marriages were formed and conducted, spending half an hour to one hour on interviewing each woman in an environment where the respondent was alone with the author and the research assistant (for translation to Swahili), thus ensuring confidentiality and increasing data reliability. Almost all these women entered into marriage between 1991 and 2004. While this survey eventually resulted in approximately 40 interviews in all selected villages, the interviewed women were not randomly selected because of the author's limited resources (i.e., convenience sampling). Although this non-random nature makes it difficult for the current study to generalize the findings from this survey, the obtained data still revealed a common picture about the process of marital formation in the surveyed area in those days of interest.

Based upon those interviews, marriages formally arranged by a groom's and a bride's parents hardly existed during the sample periods of the KHDS.³⁹ Commonly, a groom would be introduced to a bride at a church, a market, or his relatives' residence, and would initiate a process of marriage by proposing to her. In those days, a woman would often receive many proposals - the interviewed women reported minimum of 2 and maximum exceeding 20 - from both her neighboring and distant villages; thus, it was common for females to refuse an unwanted offer of marriage. Most women selected their husband despite not having many opportunities to meet or talk with him. For

³⁷One may think that it must also be assumed that in rural areas, women have limited access to formal insurance of protecting them as well as that women are strategically able or willing to choose their husbands by themselves. However, these assumptions are not necessary. The first assumption, although it seems true (Mboghoina and Osberg, 2010), is not required because the possibility of inheriting a late husband's land must be women's interest, even when they have access to formal insurance. The second assumption may also be redundant because it is certainly possible that parents caring about their daughter's welfare strategically choose her husband.

³⁸Consequently, the sampled villages were located a great distance from each other, thus covering the entire district.

³⁹This was consistent with views of researchers and the NGO staff members residing in Dar es Salaam and Kagera that the author interviewed prior to the questionnaire survey.

example, about 70% of the interviewed women said that, before getting married, they had met their husband fewer than 10 times or had known him for less than 3 months. When choosing a partner, instead, a woman carefully investigated a groom's family through her friends and relatives living in the groom's village.⁴⁰ In some cases, a bride herself visited a groom's natal village and explored the groom's family by talking to his neighbors.

In this survey, the author asked respondents whether each item displayed in Table A.5 was an important consideration when choosing a husband. For example, 91% of the interviewed women preferred a husband belonging to a different clan, suggesting the significance of clan exogamy, which is associated with local preferences to avoid marrying somebody that has close blood relationship, and women's marriage-related migration in this region.⁴¹ While the most important consideration, as indicated by questionnaire responses, was whether a husband's family was 'good' - in the sense that it did not practice witchcraft and had no criminals or sick members - interestingly, approximately 63% of the interviewed women agreed that whether a husband's family was considerate enough to allow them to inherit a husband's properties in case of the husband's death was one of their considerations. While the author does not intend to place much emphasis on this answer because of potential response bias, it seems true that a bride did have a way of collecting information about a groom's family living in a village different from her natal village and that she strategically chose the best partner. These findings provide a justification for the above assumption.

In subsection 2.3, it was also argued that women's land rights movement emerged in the 1990s and the ideology has gradually penetrated through the society. As a matter of fact, approximately 58% of the interviewed females were aware of some activities (e.g., workshops, seminars) aimed at removing discrimination against women in accessing land rights when their husband proposed to them, and almost all women recognized such activities during the interviews.

⁴⁰When a groom makes a proposal and a bride responds, families on both sides commonly use go-betweens (*mushenga* in Swahili), who would often be groom's and bride's relatives (e.g., aunt). During the sample period, the go-betweens played major roles in the process of marital formation as a messenger between families, a negotiator of bride prices, and an investigator about a groom's family.

⁴¹As a matter of fact, about 65% of the currently married interviewed women were living in a village different from their natal villages, and almost all those women lived in their husband's natal village.

B APPENDIX: VILLAGE-LEVEL CONTROLS

B.1 Demography

Population: the number of residents. In wave 1 (5), one village (one village) did not report the number. For these villages, it was assumed that the number took the value of the sample average.

Ethnicity: categorical variables for the largest ethnic groups, such as hanzaza, nyambo, subi, wahaya, and other (reference group).

Religion: categorical variables for the major religions such as Catholic, Lutheran, Muslim, and other Protestant (reference group).

B.2 Mortality

HIV/AIDS: an indicator for a village that referred to HIV/AIDS as the most important health problem.

Recent deaths: the number of people who died in the past 12 months in a village (classified into three age groups - under 15, 15 to 49, and over 50). In wave 1 (5), one village (12 villages) did not report the number for all the age groups. For these villages, it was assumed that the number took the value of the sample average.

Orphans: the number of children under the age of 15 that did not have their natural parents in a village (grouped according to the parent they lost, i.e., mother only, father only, and both). In wave 1 (5), three village (10 villages) did not report the number for all the groups. For these villages, it was assumed that the number took the value of the sample average.

B.3 Refugees

More arrival: an indicator for a village that experienced net inflow of population in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5).

Dispensary: an indicator for the presence of this health-related facility.

Health center: an indicator for the presence of this health-related facility.

Hospital: an indicator for the presence of this health-related facility.

Feeding post/daycare center: an indicator for the presence of this health-related facility.

In-migration from Burundi: an indicator for a village to which people temporarily came from Burundi during certain periods of year to look for jobs.

In-migration from Rwanda: an indicator for a village to which people temporarily came from Rwanda during certain periods of year to look for jobs.

B.4 Natural disasters

Flood: an indicator for a village that referred to flood as the first or second most important disasters experienced in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5).

Drought: an indicator for a village that referred to drought as the first or second most important disasters experienced in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5).

Epidemic: an indicator for a village that referred to epidemic as the first or second most important disasters experienced in the last 5-10 years (i.e., 1985-1991 in wave 1, 1993-2004 in wave 5).

B.5 Economy

Life quality (better): an indicator for a village that experienced an improvement of life quality (subjective evaluation), compared to about 10 years ago (i.e., 1980 in wave 1, 1993 in wave 5).

Land market: an indicator for a village in which people purchased or sold land.

Drinking bar/restaurant: an indicator for the presence of this facility.

Daily market: an indicator for the presence of a daily market.

Job search (easier): an indicator for a village in which it become easier for people to find work (subjective evaluation), compared to about 5-10 years ago (i.e., 1985 in wave 1, ten years ago in wave 5).

Agricultural center: An indicator for the presence of an agricultural extension center.

Motorable road: an indicator for the presence of this facility.

Electricity/generators: an indicator for the presence of this facility.

Pipe-borne water: an indicator for the presence of this facility.

Post office/public phone: an indicator for the presence of this facility.

Bank: an indicator for the presence of a bank.

Public transportation: an indicator for a village by which public transportation passed.

Communal land: an indicator variable for the presence of this communally-owned asset.

Communal farm/fish equipment: an indicator variable for the presence of this communally-owned asset.

Communal transport: an indicator variable for the presence of this communally-owned asset.

Communal water supply: an indicator variable for the presence of this communally-owned asset.

Food crops: an indicator for a village in which one of the most major crops was either banana, bean, cassava, or maize.

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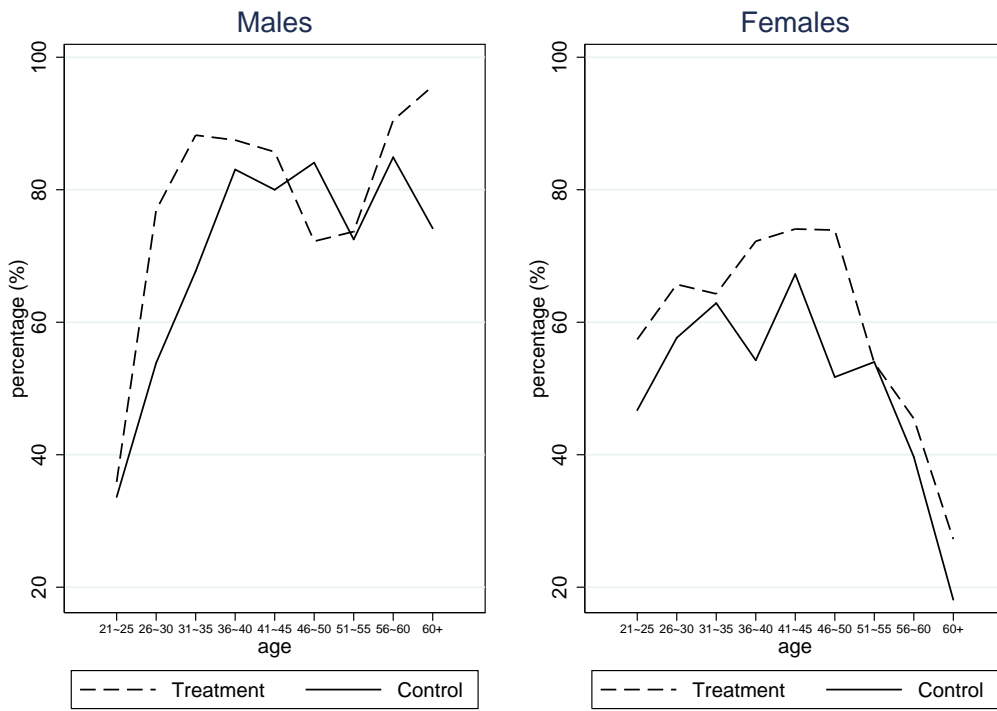


Figure 1: Percentage of wedded population among adults aged 21 years or above in wave 1

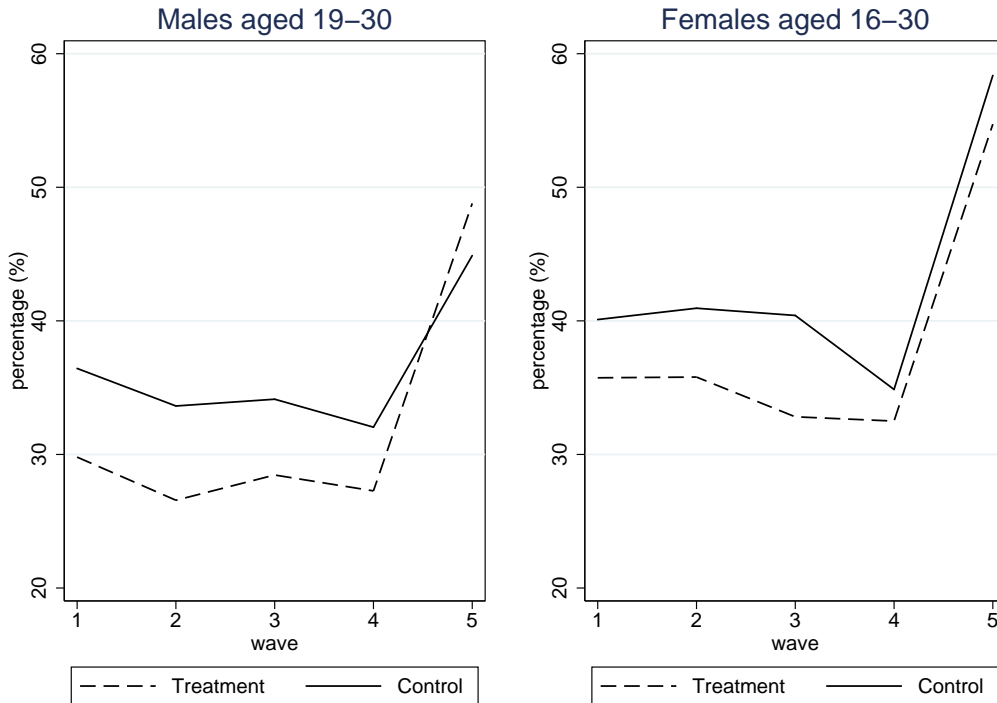


Figure 2: Percentage of wedded population among adults in all waves

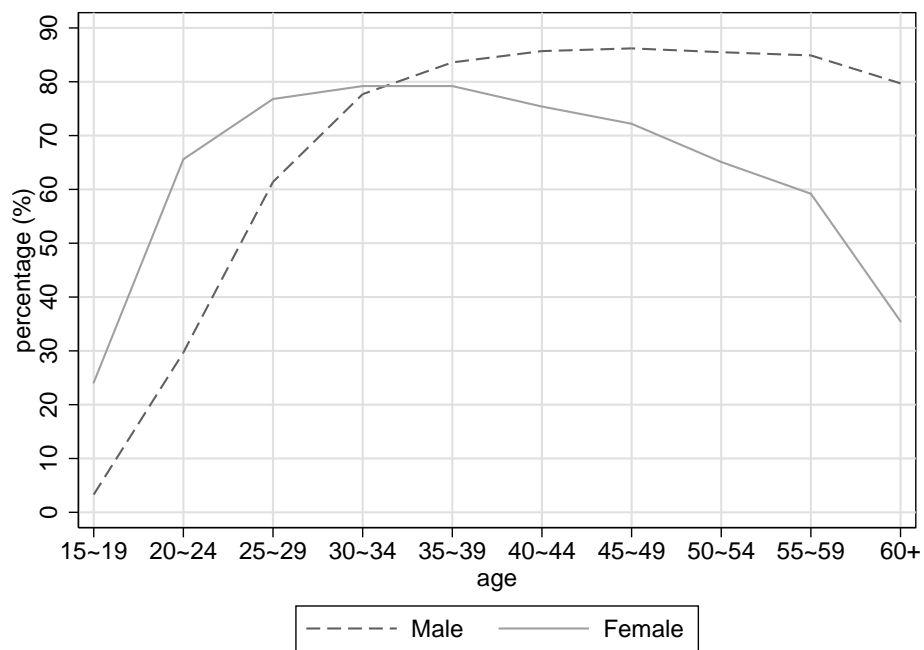


Figure A.1: Percentage of wedded population in Tanzania by age and sex

Source: 2002 Population and Housing Census

Note: Wedded population consists of not only those who are formally married irrespective of the type of marriage but those in consensual unions or socially recognized stable unions.

Table 1: Reason for migration

	Move out from wave 1 to 5		Move in by wave 1	
	Male	Female	Male	Female
(1) Economic reason				
No job / wanted better job	0.07	0.02	0.08	0.01
Business opportunities	0.21	0.04	0.02	0.00
Land not available	0.11	0.03	0.18	0.05
(2) Schooling	0.09	0.06	0.03	0.02
(3) Family-related reason				
Marriage	0.03	0.47	0.00	0.44
Divorce	0.00	0.03	0.00	0.06
Widowhood	0.05	0.02	0.00	0.02
Death of parents	0.00	0.00	0.12	0.06
Illness of household members	0.00	0.01	0.01	0.01
Other family problems	0.05	0.02	0.15	0.11
(4) Political reason				
Posted to new area	0.02	0.00	0.07	0.03
Political / economic problems	0.07	0.06	0.02	0.00
(5) Other	0.24	0.17	0.26	0.14
No. of migrants	626	955	995	1521

Notes: (1) Migrants in the first two columns are those who migrated out their original village at some point between 1991 and 2004, whereas migrants in the latter two columns are those interviewed in wave 1 who migrated into their surveyed village prior to wave 1. (2) The number is the proportion relative to the total number of migrants in each category.

Table 2: Marriage and migration by migration status

	Migrants			Non-migrants
	Total	Internal	External	
(A) Males				
Married in wave 5	0.36	0.38	0.31	0.37
No. of individuals	444	317	127	962
(B) Females				
Married in wave 5	0.64	0.67	0.51	0.19
No. of individuals	685	552	133	758

Notes: (1) Individuals are respondents who were interviewed in both waves 1 and 5 and single in wave 1. (2) Migrants can be split into those who moved out of original villages but remained within Kagera (internal) and those who left the region (external). (3) The number is the proportion relative to the total number of individuals in each gender-migration-status category.

Table 3: Summary statistics (treatment and control villages)

	Wave 1						Wave 5					
	Treatment			Control			Treatment			Control		
	Mean	Std.	N	Mean	Std.	N	Mean	Std.	N	Mean	Std.	N
(A) Individual characteristics: Males aged 19-30												
Married (dummy)	0.29	[0.45]	151	0.36	[0.48]	236	0.48	[0.50]	332	0.44	[0.49]	528
Age	23.33	[3.48]	151	23.45	[3.49]	236	24.50	[3.48]	332	24.57	[3.38]	528
Education (years)	6.52	[2.69]	151	6.61	[2.76]	236	6.43	[3.03]	330	6.31	[3.34]	523
Parents' education (years)	4.72	[3.03]	151	4.51	[3.45]	236	5.27	[3.23]	332	5.49	[3.35]	528
Father	2.82	[2.86]	151	2.96	[2.95]	236	4.53	[2.86]	332	4.38	[3.07]	528
Mother												
Parents died prior to a respondent being age 15 (one if yes)												
Father	0.11	[0.31]	100	0.14	[0.34]	163	0.32*	[0.46]	332	0.26	[0.44]	528
Mother	0.06	[0.23]	100	0.07	[0.27]	163	0.23*	[0.42]	332	0.18	[0.39]	528
(B) Village characteristics												
Demography												
Population	2494.42	[1642.03]	21	2854.91	[1519.15]	30	2879.90	[1522.01]	21	3178.68	[2284.62]	30
Wahaya (major ethnic group)	0.90**	[0.30]	21	0.63	[0.49]	30	0.80	[0.40]	21	0.63	[0.49]	30
Catholic (major religion)	0.90	[0.30]	21	0.89	[0.30]	29	0.85	[0.35]	21	0.83	[0.37]	30
Mortality												
HIV/AIDS	0.04	[0.21]	21	0.16	[0.37]	30	0.14	[0.35]	21	0.03	[0.18]	30
Recent deaths (below 15)	28.80	[34.97]	21	18.87	[13.38]	30	10.54*	[6.09]	21	14.94	[10.27]	30
Recent deaths (15 to 49)	30.90	[24.38]	21	24.65	[20.91]	30	9.27	[5.10]	21	10.37	[4.96]	30
Recent deaths (50 or above)	18.42**	[18.52]	21	9.71	[5.12]	30	9.02	[5.27]	21	9.62	[6.06]	30
Orphans (only mother)	43.42	[43.64]	21	42.24	[33.52]	30	51.62	[51.63]	21	37.57	[21.69]	30
Orphans (only father)	75.87	[87.30]	21	64.92	[39.69]	30	46.18	[47.13]	21	57.68	[43.79]	30
Orphans (both)	25.92	[32.49]	21	22.52	[14.23]	30	36.05	[46.37]	21	35.30	[31.33]	30
Refugees												
More arrival	0.38	[0.49]	21	0.46	[0.50]	30	0.61	[0.49]	21	0.53	[0.50]	30
Dispensary	0.33	[0.48]	21	0.26	[0.44]	30	0.33	[0.48]	21	0.33	[0.47]	30
Health center	0.14	[0.35]	21	0.10	[0.30]	30	0.04	[0.21]	21	0.13	[0.34]	30
Hospital	0.09	[0.30]	21	0.06	[0.25]	30	0.04	[0.21]	21	0.06	[0.25]	30
Feeding post/daycare center	0.95	[0.21]	21	0.93	[0.25]	30	0.09	[0.30]	21	0.06	[0.25]	30
In-migration from Burundi	0.14	[0.35]	21	0.16	[0.37]	30	0.00	[-]	21	0.06	[0.25]	30
In-migration from Rwanda	0.23	[0.43]	21	0.16	[0.37]	30	0.00	[-]	21	0.00	[-]	30
Natural disasters												
Flood	0.14	[0.35]	21	0.13	[0.34]	30	0.28	[0.46]	21	0.50	[0.50]	30
Drought	0.71	[0.46]	21	0.60	[0.49]	30	0.57	[0.50]	21	0.40	[0.49]	30
Epidemic	0.47	[0.51]	21	0.56	[0.50]	30	0.28	[0.46]	21	0.26	[0.44]	30
Economy												
Life quality (better)	0.04**	[0.21]	21	0.23	[0.43]	30	0.76	[0.43]	21	0.76	[0.43]	30
Land market	0.57	[0.50]	21	0.50	[0.50]	30	0.61	[0.49]	21	0.73	[0.44]	30
Restaurant/bar	0.52	[0.51]	21	0.70	[0.46]	30	0.28	[0.46]	21	0.30	[0.46]	30
Daily market	0.38	[0.49]	21	0.36	[0.49]	30	0.47	[0.51]	21	0.50	[0.50]	30
Job search (easier)	0.04	[0.21]	21	0.10	[0.30]	30	0.57	[0.50]	21	0.56	[0.50]	30
Agricultural extension center	0.04	[0.21]	21	0.06	[0.25]	30	0.23	[0.43]	21	0.10	[0.30]	30
Motorable road	1.00	[-]	21	0.93	[0.25]	30	0.90	[0.30]	21	0.96	[0.18]	30
Electricity	0.23	[0.43]	21	0.30	[0.46]	30	0.76	[0.43]	21	0.63	[0.49]	30
Pipe-borne water	0.14	[0.35]	21	0.26	[0.44]	30	0.14	[0.35]	21	0.30	[0.46]	30
Post office/public phone	0.09	[0.30]	21	0.10	[0.30]	30	0.09	[0.30]	21	0.06	[0.25]	30
Bank	0.09	[0.30]	21	0.13	[0.34]	30	0.09	[0.30]	21	0.03	[0.18]	30
Public transportation	0.33	[0.48]	21	0.20	[0.40]	30	0.71	[0.46]	21	0.70	[0.46]	30
Communal land	0.57**	[0.50]	21	0.26	[0.44]	30	0.95	[0.21]	21	0.83	[0.37]	30
Communal farm/fish equipment	0.04	[0.21]	21	0.00	[-]	30	0.09	[0.30]	21	0.03	[0.18]	30
Communal transport	0.04	[0.21]	21	0.00	[-]	30	0.00	[-]	21	0.00	[-]	30
Communal water supply	0.47	0.51	21	0.50	[0.50]	30	0.76	[0.43]	21	0.56	[0.50]	30
Food crops (major crops)	0.04	[0.21]	21	0.16	[0.37]	30	0.66	[0.48]	21	0.66	[0.47]	30

Notes: (1) Unit of observations is an individual and a village in the panel (A) and (B), respectively. In each wave, the equality of means between the treatment and control villages is examined. *** denotes significance at 1%, ** at 5%, and * at 10%.

Table 4: Impacts of inheritance right to land

Dependent variables: Sample:	One if married										Bride prices (million TZS)		
	Males aged 19-30										Married males in wave 5 (under 17 in wave 1)		
	LPM	LPM	Probit (ME)	LPM	LPM	LPM	LPM	LPM	LPM	LPM	LPM	OLS	OLS
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)
Land	0.046 [0.045]	0.178*** [0.031]	0.267*** [0.063]	-	-	0.237*** [0.062]	0.187*** [0.028]	0.159*** [0.018]	0.164*** [0.015]	0.150*** [0.033]	-0.053 [0.036]	-0.061* [0.034]	-0.099*** [0.030]
House	-	0.194*** [0.037]	-	-	-	-0.075 [0.071]	-	-	-	-	-	-	-
Both land and house (Land × house)	-	-	-	0.164*** [0.029]	-	-	-	-	-	-	-	-	-
Either land or house	-	-	-	-	0.207*** [0.039]	-	-	-	-	-	-	-	-
Other property	-	-	-	-	-	-	-0.053 [0.051]	-	0.153* [0.078]	-	-	-0.029 [0.045]	-0.113** [0.047]
Wife inheritance	-	-	-	-	-	-	-	-	-	-	-	-	-0.164** [0.068]
Land × No. of refugee camps within 25km	-	-	-	-	-	-	-	-	-	0.071 [0.062]	-	-	-
The person who knows the most about cultural practices	-	-	-	-	-	-	-	-0.434*** [0.118]	-0.275*** [0.048]	-	-	-	-
Male	-	-	-	-	-	-	-	-0.040** [0.016]	0.005 [0.028]	-	-	-	-
Age (years)	-	-	-	-	-	-	-	0.000*** [0.000]	0.000 [0.000]	-	-	-	-
Age squared	-	-	-	-	-	-	-	0.025*** [0.004]	0.006 [0.009]	-	-	-	-
Years in community	-	-	-	-	-	-	-	-0.000*** [0.000]	-0.000 [0.000]	-	-	-	-
Years in com. squared	-	-	-	-	-	-	-	-	-	-	-	-	-
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Village FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
District FE	Yes	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA	NA	NA
R-squared	0.333	0.384	0.346	0.384	0.384	0.384	0.384	0.381	0.381	0.384	0.376	0.377	0.379
No. of obs.	1104	1104	1104	1104	1104	1104	1104	1077	1077	1104	238	238	238

Notes: (1) Figures [] are standard errors. *** denotes significance at 1%, ** at 5%, and * at 10%. (2) Standard errors are robust to heteroskedasticity and clustered residuals within each village. (3) Individual controls include age; education; father's education; an indicator variable for a respondent whose father died before he became 15 years old; an indicator variable for a respondent whose mother died before he became 15 years old. (4) Village controls include information on demography (three items), mortality (seven items), refugee inflows from Burundi and Rwanda (seven items), natural disasters (three items) and an economy (17 items). See Appendix B for the details. (5) The LPM and ME stand for 'linear probability model' and 'marginal effect', respectively.

Table 5: Implications for women

Dependent variable: Sample:	One if married				
	Females aged 16-30		Males aged 19-30		
	LPM	Probit (ME)	LPM	LPM	LPM
	(a)	(b)	(c)	(d)	(e)
Land	-0.038 [0.044]	-0.046 [0.058]	0.189*** [0.028]	0.072*** [0.026]	0.041 [0.121]
Land × HIV/AIDS	-	-	0.249*** [0.069]	-	-0.053 [0.068]
Recent deaths (below 15)	-	-	-	-	-0.001 [0.008]
Recent deaths (15 to 49)	-	-	-	0.005*** [0.001]	0.005*** [0.001]
Recent deaths (50 or above)	-	-	-	0.004* [0.002]	0.008 [0.021]
HIV/AIDS	0.033 [0.094]	0.006 [0.116]	-0.630*** [0.059]	-0.457*** [0.032]	-0.461*** [0.157]
Recent deaths (below 15)	-0.002 [0.002]	-0.003 [0.002]	0.003** [0.001]	0.002** [0.001]	0.002 [0.002]
Recent deaths (15 to 49)	0.000 [0.002]	0.001 [0.002]	0.004*** [0.001]	0.001** [0.001]	0.001 [0.002]
Recent deaths (50 or above)	0.000 [0.002]	0.000 [0.003]	0.006*** [0.001]	0.003*** [0.001]	0.004*** [0.001]
Individual controls	Yes	Yes	Yes	Yes	Yes
Village controls	Yes	Yes	Yes	Yes	Yes
Village FE	Yes	Yes	Yes	Yes	Yes
Time trend	Yes	Yes	Yes	Yes	Yes
R-squared	0.283	0.233	0.385	0.385	0.385
No. of obs.	1578	1578	1104	1104	1104

Notes: (1) Figures [] are standard errors. *** denotes significance at 1%, ** at 5%, and * at 10%. (2) Standard errors are robust to heteroskedasticity and clustered residuals within each village. (3) Individual controls include age; education; father's education; mother's education; an indicator variable for a respondent whose father died before s/he became 15 years old; an indicator variable for a respondent whose mother died before s/he became 15 years old. (4) Village controls include information on demography (three items), mortality (seven items), refugee inflows from Burundi and Rwanda (seven items), natural disasters (three items) and an economy (17 items). See Appendix B for the details. (5) The LPM and ME stand for 'linear probability model' and 'marginal effect', respectively.

Table A.1: Correlation between marriage and migration

Dependent variable: Sample:	One if married in wave 5			
	All		Only single at baseline	
	Male (a)	Female (b)	Male (c)	Female (d)
Migrate between waves 1 and 5 (dummy)	0.008 [0.029]	0.372*** [0.028]	0.019 [0.034]	0.462*** [0.026]
Married in wave 1 (dummy)	0.536*** [0.019]	0.376*** [0.030]	-	-
Constant	0.457*** [0.010]	0.273*** [0.018]	0.452*** [0.009]	0.268*** [0.013]
Village FE	Yes	Yes	Yes	Yes
R-squared	0.231	0.213	0.044	0.261
No. of obs.	1788	1901	1406	1443

Notes: (1) Figures [] are standard errors. *** denotes significance at 1%, ** at 5%, and * at 10%. (2) Standard errors are robust to heteroskedasticity and clustered residuals within each village. (3) Columns (a) and (b) exploit all panel individuals with a control of marital status in wave 1, whereas columns (c) and (d) limit the sample only to those who were single in wave 1.

Table A.2: Summary statistics (treatment and control villages): DID estimates

Dependent variables:	Coefficient	standard errors	No. of obs.	Unit of obs.
(A) Individual characteristics: Males aged 19-30				
Married (dummy)	0.105*	[0.60]	1247	I
Age	0.048	[0.385]	1247	I
Education (years)	0.208	[0.354]	1240	I
Parents' education (years)				
Father	-0.430	[0.431]	1247	I
Mother	0.294	[0.336]	1247	I
Parents died prior to a respondent being age 15 (one if yes)				
Father	0.093	[0.063]	1123	I
Mother	0.068	[0.053]	1123	I
(B) Village characteristics				
Demography				
Population	61.705	[345.650]	102	V
Wahaya (major ethnic group)	-0.095	[0.066]	102	V
Catholic (major religion)	0.016	[0.137]	101	V
Mortality				
HIV/AIDS	0.229**	[0.103]	102	V
Recent deaths (below 15)	-14.332*	[7.682]	102	V
Recent deaths (15 to 49)	-7.351	[6.904]	102	V
Recent deaths (50 or above)	-9.318*	[4.756]	102	V
Orphans (only mother)	12.874	[18.154]	102	V
Orphans (only father)	-22.455	[22.986]	102	V
Orphans (both)	-2.648	[14.493]	102	V
Refugees				
More arrival	0.171	[0.210]	102	V
Dispensary	-0.067	[0.128]	102	V
Health center	-0.129*	[0.074]	102	V
Hospital	-0.048	[0.048]	102	V
Feeding post/daycare center	0.010	[0.112]	102	V
In-migration from Burundi	-0.043	[0.118]	102	V
In-migration from Rwanda	-0.071	[0.118]	102	V
Natural disasters				
Flood	-0.224	[0.154]	102	V
Drought	0.057	[0.188]	102	V
Epidemic	0.110	[0.191]	102	V
Economy				
Life quality (better)	0.181	[0.154]	102	V
Land market	-0.186	[0.180]	102	V
Restaurant/bar	0.162	[0.178]	102	V
Daily market	-0.038	[0.165]	102	V
Job search (easier)	0.057	[0.153]	102	V
Agricultural extension center	0.157	[0.135]	102	V
Motorable road	-0.129*	[0.074]	102	V
Electricity	0.190	[0.150]	102	V
Pipe-borne water	-0.033	[0.133]	102	V
Post office/public phone	0.033	[0.091]	102	V
Bank	0.100	[0.089]	102	V
Public transportation	-0.119	[0.143]	102	V
Communal land	-0.186	[0.151]	102	V
Communal farm/fish equipment	0.014	[0.090]	102	V
Communal transport	-0.048	[0.048]	102	V
Communal water supply	0.219	[0.196]	102	V
Food crops (major crops)	0.119	[0.186]	102	V

Notes: (1) Figures [] are standard errors. *** denotes significance at 1%, ** at 5%, and * at 10%. (2) Standard errors are robust to heteroskedasticity and clustered residuals within each village. (3) The I and V stand for 'individual' and 'village', respectively.

Table A.3: Summary statistics (progressive and regressive villages)

	Wave 1						Wave 5					
	Progressive ($D_{jt} = 1$)			Regressive ($D_{jt} = 0$)			Progressive ($D_{jt} = 1$)			Regressive ($D_{jt} = 0$)		
	Mean	Std.	N	Mean	Std.	N	Mean	Std.	N	Mean	Std.	N
(A) Individual characteristics: Males aged 19-30												
Married (dummy)	0.39**	[0.49]	195	0.28	[0.45]	192	0.48***	[0.50]	725	0.33	[0.47]	135
Age	23.56	[3.49]	195	23.25	[3.48]	192	24.58	[3.45]	725	24.37	[3.24]	135
Education (years)	6.52	[2.94]	195	6.64	[2.52]	192	6.22***	[3.24]	719	7.11	[3.03]	134
Parents' education (years)												
Father	4.32	[3.49]	195	4.87	[3.06]	192	5.19***	[3.23]	725	6.55	[3.45]	135
Mother	2.82	[2.97]	195	2.99	[2.86]	192	4.22***	[2.96]	725	5.54	[2.93]	135
Parents died prior to a respondent being age 15 (one if yes)												
Father	0.15	[0.36]	134	0.10	[0.30]	129	0.27*	[0.44]	725	0.35	[0.48]	135
Mother	0.06	[0.25]	134	0.07	[0.26]	129	0.17***	[0.38]	725	0.36	[0.48]	135
(B) Village characteristics												
Demography												
Population	3037.85	[1589.52]	25	2387.84	[1502.46]	26	3250.49***	[2055.75]	44	1831.00	[904.32]	7
Wahaya (major ethnic group)	0.56***	[0.50]	25	0.92	[0.27]	26	0.65***	[0.47]	44	1.00	[-]	7
Catholic (major religion)	0.87	[0.33]	24	0.92	[0.27]	26	0.84	[0.36]	44	0.85	[0.37]	7
Mortality												
HIV/AIDS	0.08	[0.27]	25	0.15	[0.36]	26	0.09**	[0.29]	44	0.00	[-]	7
Recent deaths (below 15)	19.64	[14.42]	25	26.15	[31.83]	26	13.35	[8.91]	44	11.73	[10.09]	7
Recent deaths (15 to 49)	22.94	[21.60]	25	31.34	[22.76]	26	9.79	[4.97]	44	10.70	[5.47]	7
Recent deaths (50 or above)	9.49**	[5.51]	25	16.96	[16.88]	26	9.61	[5.70]	44	7.91	[5.91]	7
Orphans (only mother)	38.53	[34.89]	25	46.76	[40.30]	26	44.45	[38.67]	44	36.47	[28.04]	7
Orphans (only father)	60.34	[40.26]	25	78.17	[79.16]	26	49.21	[38.15]	44	76.42	[75.94]	7
Orphans (both)	20.54	[13.87]	25	27.17	[29.63]	26	33.56	[33.90]	44	48.51	[58.77]	7
Refugees												
More arrival	0.52	[0.50]	25	0.34	[0.48]	26	0.56	[0.50]	44	0.57	[0.53]	7
Dispensary	0.24	[0.43]	25	0.34	[0.48]	26	0.31	[0.47]	44	0.42	[0.53]	7
Health center	0.12	[0.33]	25	0.11	[0.32]	26	0.09	[0.29]	44	0.14	[0.37]	7
Hospital	0.08	[0.27]	25	0.07	[0.27]	26	0.06	[0.25]	44	0.00	[-]	7
Feeding post/daycare center	0.96	[0.20]	25	0.92	[0.27]	26	0.04	[0.21]	44	0.28	[0.48]	7
In-migration from Burundi	0.16	[0.37]	25	0.15	[0.36]	26	0.04	[0.21]	44	0.00	[-]	7
In-migration from Rwanda	0.16	[0.37]	25	0.23	[0.42]	26	0.00	[-]	44	0.00	[-]	7
Natural disasters												
Flood	0.16	[0.37]	25	0.11	[0.32]	26	0.45*	[0.50]	44	0.14	[0.37]	7
Drought	0.56	[0.50]	25	0.73	[0.45]	26	0.45	[0.50]	44	0.57	[0.53]	7
Epidemic	0.64	[0.48]	25	0.42	[0.50]	26	0.25	[0.43]	44	0.42	[0.53]	7
Economy												
Life quality (better)	0.28**	[0.45]	25	0.03	[0.19]	26	0.79	[0.40]	44	0.57	[0.53]	7
Land market	0.48	[0.50]	25	0.57	[0.50]	26	0.65	[0.47]	44	0.85	[0.37]	7
Bar/restaurant	0.76*	[0.43]	25	0.50	[0.50]	26	0.27	[0.45]	44	0.42	[0.53]	7
Daily market	0.40	[0.50]	25	0.34	[0.48]	26	0.40***	[0.49]	44	1.00	[-]	7
Job search (easier)	0.12	[0.33]	25	0.03	[0.19]	26	0.61	[0.49]	44	0.28	[0.48]	7
Agricultural extension center	0.04	[0.20]	25	0.07	[0.27]	26	0.18***	[0.39]	44	0.00	[-]	7
Motorable road	0.25	[0.92]	25	1.00	[-]	26	0.93*	[0.25]	44	1.00	[-]	7
Electricity/generators	0.32	[0.47]	25	0.23	[0.42]	26	0.63***	[0.48]	44	1.00	[-]	7
Pipe-borne water	0.32*	[0.47]	25	0.11	[0.32]	26	0.20	[0.40]	44	0.42	[0.53]	7
Post office/public phone	0.08	[0.27]	25	0.11	[0.32]	26	0.06	[0.25]	44	0.14	[0.37]	7
Bank	0.16	[0.37]	25	0.07	[0.27]	26	0.04	[0.21]	44	0.14	[0.37]	7
Public transportation	0.24	[0.43]	25	0.26	[0.45]	26	0.65***	[0.47]	44	1.00	[-]	7
Communal land	0.24**	[0.43]	25	0.53	[0.50]	26	0.86**	[0.34]	44	1.00	[-]	7
Communal farm/fish equipment	0.00	[-]	25	0.03	[0.19]	26	0.06*	[0.25]	44	0.00	[-]	7
Communal transport	0.00	[-]	25	0.03	[0.19]	26	0.00	[-]	44	0.00	[-]	7
Communal water supply	0.52	[0.50]	25	0.46	[0.50]	26	0.61	[0.42]	44	0.85	[0.37]	7
Food crops (major crops)	0.20*	[0.40]	25	0.03	[0.19]	26	0.63	[0.48]	44	0.85	[0.37]	7

Notes: (1) Unit of observations is an individual and a village in the panel (A) and (B), respectively. In each wave, the equality of means between the progressive and regressive villages is examined. *** denotes significance at 1%, ** at 5%, and * at 10%.

Table A.4: Correlation coefficient between inheritance rules among the 51 KHDS villages

Wave	Land and house		Land and other property	
	Coefficient	p-values	Coefficient	p-values
	1	0.924***	[0.000]	0.358***
2	0.760***	[0.000]	0.478***	[0.000]
3	0.838***	[0.000]	0.281**	[0.045]
4	0.738***	[0.000]	0.346**	[0.012]
5	0.738***	[0.000]	0.142	[0.318]

Note: *** denotes significance at 1% and ** at 5%.

Table A.5: Considerations when choosing a husband

(1) Own age (maturity)	0.91
(2) A husband's age (similarity, maturity)	0.83
(3) A husband's education	0.63
(4) A husband belongs to a different clan	0.91
(5) A husband is in the same ethnic group	0.83
(6) A husband has no other wives	0.91
(7) A husband has the same religion	0.83
(8) A husband's family is rich	0.69
(9) A husband's family allows a widow to inherit a husband's properties	0.63
(10) A husband's family is 'good' in the sense that	
No witchcraft practices	0.88
No criminals	0.88
No ill members	0.80

Notes: (1) The observations were 36 females aged 30-40 years in 2012. (2) The number is the proportion.