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Informal Institutions and Intergenerational Contracts: Evidence from Schooling and Remittances in Rural Tanzania

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Abstract

This paper carries out a theoretical and empirical investigation of the role of informal institutions in facilitating intergenerational contracts governing investments in schooling and payments of pensions in the form of remittances. We show, using detailed household-level data from rural Tanzania, that informal institutions of social control, rooted in tribal affiliations, determine both the household's investment in schooling and the probability that it receives remittances from migrants. This is consistent with a framework in which households' expected returns in the form of remittances, which is determined partly by the prospects of social control over migrants, influence current investments in schooling.

Keywords: intergenerational contract, social compact, schooling, human capital, traditions, ethnicity, ethnic diversity, social capital, Tanzania, Africa
JEL codes: D130, O150.

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1 Introduction

Investment in human capital in the form of schooling is one of the primary ingredients of economic growth. In all developed countries, basic schooling is provided for free or at low cost by the state, but both historically and in contemporary less developed economies, the most common form of investment in human capital is parental, or family, investment in schooling on behalf of children. Unlike other types of investments or saving instruments, however, investing in children is characterized by a fundamental problem of intergenerational contracting: parents cannot make a legal claim for return on, or even repayment of, the investment. In some cases, this inability can make parents choose less schooling (Ben-Porath, 1967) and instead rely on other modes of savings.

The basic problem is that children are not allowed to enter contractual agreements such as promising to provide for their parents in exchange for schooling investments made by the parents on behalf of their children. Becker and Murphy (1988) and Thompson and Ruhter (1979) argue that a possible response to this time inconsistency problem is for the state to provide schooling to young people and, at the same time, enforce old-age pensions such that the working population, when making investments in schooling, would be entitled to a share of the returns in the form of pensions paid out when they are old. This political equilibrium, denoted a social compact by Becker and Murphy (1988, p. 9), separates the individual investment from the individual return and makes enforcement a non-issue as both schooling and taxation is made compulsory by the state.[1] Recent analyses by Rangel (2003) and Boldrin and Montes (2005) provide a formal analysis of the Becker-Murphy argument, the latter focusing specifically on education and pensions, the former providing a general analysis of self-sustaining agreements over intergenerational goods.

Such intertemporal social compacts require a state sufficiently strong that it can credibly both raise taxes for (future) pensions and provide adequate schooling for children. However, a defining feature of less developed economies is that the provision of many services takes place through informal institutional arrangements, rather than the formal institutions embodied in developed economies. What happens when the state is not that strong? The result may be autarchy (Thompson and Ruhter, 1979) in which children's human capital is not used for savings at all, or under some circumstances, the result may be self-enforcing family equilibria based on tit-for-tat type strategies by children towards defecting adult children (Ehrlich and Lui, 1991; Cigno, 1993; Rangel, 2003). Becker and Tomes (1985) and Becker and Murphy (1988), and many with them, point to the existence of social norms that can pressure children

[1] Given that all other children are educated and parents will receive old-age support from the state, a free-riding problem emerges since parents could be tempted to have their own children working. See Thompson and Ruhter (1979) for a complete framework that includes also compulsory schooling and child labor laws as well as school leaving laws, and Goldin and Parsons (1989) for evidence from the U.S. in the 19th century.

to support parents in exchange for investments in schooling done by the parents or extended family on behalf of the children, paving the way for investments to be made in the first place, an impression strongly supported by our field data from Tanzania; for example, one respondent recalled a story where

> "In a neighboring village the father was neglected by the well-paid son that was living in the distant city Dar [es Salaam]. The father arranged a trip to go to him, but he was still betrayed. While he was in Dar, the father got assistance from others and visited the son's employer and he was granted a monthly lump sum that was deducted from the son's salary." [C13, Q8, translated].[2]

The case where the social compact is not enforced by the state is important, both historically and in the contemporary developing world, and the role of social norms – and, more generally, informal institutions and the larger civil society – in enforcing the intergenerational contract is, while frequently referred to, to our knowledge largely unexplored.[3] In this paper, we provide a theoretical framework for and an empirical investigation of the relationship between the informal social setting and the fulfillment of the intergenerational contract.

The key idea of our paper is simple: Parents invest in schooling for their children, partly with the aim of receiving a return on their investment. The expected return on the investment depends on the probability of receiving remittances from migrant children. If remittances are not paid, the child faces social sanctions from violating the norm of repayment. Such sanctions are more likely to be carried out in villages characterized by strong informal institutions. Thus, strong informal institutions increase the probability of receiving remittances, which increases the expected return on education. This, in turn, increases current investment in schooling.

To measure the strength of informal institutions, we start from the recent conceptualization of social capital. While social capital has come to mean many different things and is operationalized in many different ways, we follow Coleman (1988, 1990) in seeing social capital as different entities that "all consist of some aspect of social structures, and [...] facilitate certain actions of actors [...] within the structure." (Coleman, 1988, S98). As noted by Bates (1999, 2000), ethnicity is one such structure. Ethnic or tribal affiliation, like kinship, carries with it promises and obligations and provides, through traditions and social norms, what Coleman calls a structure.

To operationalize the role of ethnicity in informal institutions, we use a tribal fragmentation index to capture the degree of population heterogeneity along tribal lines at the village

[2] Cluster 13, item 8, translated from notes in Swahili, as are following quotes.

[3] For example, The Department for Economic and Social Affairs of the United Nations note in their 2005 Annual Report on the social situation of the world "[t]he manner in which the intergenerational contract is currently honoured varies across societies. In most developing countries, intergenerational support is sustained within a wide kinship network and sometimes through community interaction, while in developed countries the State mediates and/or supports the contract to varying degrees." (UN 2005, p. 82)

level. There is considerable evidence that such heterogeneity is associated with less success in overcoming collective action problems and providing public goods (Alesina and La Ferrara, 2005). In our setting of sub-Saharan Africa, this is an appropriate measure of informal institution strength, as insurance and the provision of services with a public element typically are organized through informal institutions grounded in kinship or tribal associations rather than in the weak or developing state. Based on this, we make one key assumption: informal institutions guiding and enforcing the set of social norms governing intergenerational exchange function better when a village is characterized by a higher degree of tribal homogeneity. This assumption, discussed in detail below, is widely supported in experimental and empirical work on the role of identity in overcoming collective action problems.

We investigate the effect of village level tribal fragmentation on schooling and remittances using two different data sets from Tanzania, both collected in the early 1990s. One covers the entire of Tanzania, another, with very detailed data on migrants and remittances, covers the Kagera region, a rural region by Lake Victoria in the Northwestern part of the country. We find that village level tribal homogeneity is associated with both more schooling and, conditional on schooling, a higher probability of receiving remittances from relatives living elsewhere. This is consistent with the idea that informal institutions facilitate honouring the intergenerational contract. Households living in villages with a higher degree of tribal fractionalization choose less schooling for the children of the household, controlling for a wide range of household, school, and village characteristics. This is the case in both data sets. In our preferred specification on the Tanzania-wide data set, increasing tribal fractionalization by one standard deviation decreases the probability of a child being in school by approximately six percentage points. In our preferred specification on the Kagera data, increasing tribal fractionalization from its minimum to its maximum level decreases the probability of observing remittances in the past six months by eight percentage points.

We identify the effect of tribal fractionalization on investment in schooling and remittances by examining the potential endogeneity of the tribal composition of villages, the possibilities of spurious effects, which could arise if tribal fractionalization is correlated with other between-village differences, and the selectivity of youngsters migrating to different places. Ethnic land settlement in East Africa is largely determined by stable historical patterns (Miguel and Gugerty, 2005; Miguel, 2004) and we show that residential mobility in and out of the villages in our sample is very limited and unrelated to tribal fractionalization and school characteristics, and that results are independent of mobility issues. Further, we compare a wide range of socioeconomic, demographic, and school quality variables across homogenous and diverse villages, both for the entire distribution of tribal fractionalization and for villages in the lowest and highest quintile of fractionalization, respectively, and find tribal fractionalization to be orthorgonal to all potentially confounding variables. Finally, we compare migrants residing

in similar environments to each other, rather than migrants in the major cities with migrants in nearby villages.

We examine several possible, and possibly coexisting, explanations for the finding that tribal fractionalization is associated with less schooling. To discriminate among these, which include the role of urban networks, credit constraints, land availability and school characteristics, we rely on several additional sources of data. In addition to the Tanzania-wide data set, we use supplementary data on social capital and inequality available for a subset of the sampled households. As a supplement to the detailed Kagera region data, in order to learn more about the causal path from tribal fractionalization to schooling and remittance, we use our own data from group interviews in Kagera villages, collected partly for this reason. Finally, we rely on the large anthropological and economic literature on tribes and kinship, and migration, respectively.

The paper links with several entwined strands of literature. As noted above, a number of papers examine implicit intergenerational contracts. Thompson and Ruhter (1979), Parsons (1984), Becker and Murphy (1988), and Ehrlich and Lui (1991) all consider some variant of the intrafamily intergenerational contract. Thompson and Ruhter (1979) and Becker and Murphy (1988) focus on the role of the state in facilitating intergenerational contracts in the absence of binding contracts with children, Parsons (1984) analyzes intergenerational transfers within the economic framework of the family, and Ehrlich and Lui (1991) consider self-enforcing agreements in an overlapping generations framework, though with a focus on fertility. Two recent papers, Rangel (2003) and Boldrin and Montes (2005) provide the game-theoretic foundations for the discussion in Becker and Murphy (1988). Rangel analyzes the general case of (as he calls them) forward and backward intergenerational goods, while Boldrin and Montes provide a focused analysis of the role of the state in providing both education and pensions. We know of only one paper that explicitly links tribal affiliation to the obligations to remit: Based on field work in the Luapula province in Zambia (Bates, 1976), Bates (2000) argues that ethnicity empowers the elders with political control over land rights that are of crucial importance for migrants wishing to return, but he does not consider the investment motive in education.

Second, the paper contributes to what is sometimes called the new economics of labor migration (Lucas and Stark, 1985; Stark, 1991; Lucas, 1997), by explicitly linking migration behavior and the decision to remit with schooling decisions. Lucas (1997, p. 750), summarizing the large literature on internal labor migration in developing countries, concludes that "it seems plausible that education is part of an intertemporal arrangement; the family educates members in order for them to migrate and gain urban entry, ultimately to repay the family from town."[4] As noted by Lucas, however, a difficulty with such an intertemporal arrangement

[4] A large literature has investigated the various motives for remittances. Cox and Rank (1992) find support for the exchange motive, Lee, Parish, and Willis (1994), and Lillard and Willis (1997, 2002) find support for the

is enforcement; however, "to some extent, trust, tradition and altruism make the family a natural enforcement unit." While the economic literature on migration and education has rarely looked beyond the household, Lucas (1997) notes that a third level of factors, denoted contextual effects in the demography literature (e.g. Hugo, 1981; Findley, 1987; Bilsborrow et al. 1987), comprises the influence and composition of the sending community upon migration decisions. Such contextual effects remain largely unexplored in both theoretical and empirical economics studies of migration-related issues, though some work has been done mainly in the context of migration networks (Winters et al. 2001) and on the role of relative deprivation as a cause of migration (Stark, 1991). This paper looks at how context – informal institutions and, to a lesser extent, social capital – affects education and remittances. Lucas and Stark (1985) show that the prospects for inheritance matter: for example, sons of families with larger herds remit more, as families have a better bargaining position in this case. In our empirical work, we also control for institutions governing inheritance when estimating the effect of informal institutions on remittances.[5]

Third, as ethnicity is part of the broader concept of social capital, the paper contributes, from a developing country perspective, to the mainly U.S.-centered literature on the effects of social capital on schooling decisions. Coleman (1988, 1990), who shares credit for introducing the term 'social capital,' examined the role of social networks (or fabric) in lowering the risk of high school dropout, and Goldin and Katz (1999) argue that the expansion of higher secondary education in the United States before WWII was influenced to a considerable extent by social capital. They measure social capital by the resources allocated by local communities to primary schooling. As such, they consider only one part of the intergenerational contract, as do Miguel and Gugerty (2005) in their careful analysis of how ethnic diversity hinders voluntary school financing in Kenya.

Finally, the paper contributes, though from a different angle, to the literature on the effects of ethnic diversity on public policy outcomes.[6] Easterly and Levine (1997) note, examining a cross-section of countries, that economic growth is negatively related to the degree of ethnolinguistic fractionalization. Alesina, Baqir and Easterly (1999) find that less funds are allocated to local public goods provision in more racially diverse municipalities in the U.S., and Miguel and Gugerty (2005) argue that it is the relative inability to impose sanctions across ethnic groups

repayment of implicit loan-hypothesis in South-East Asia, while Raut and Tran (2005) reject the loan motive in favor of a reciprocity motive. Cox and Fafchamps (2008) provide a recent survey.

[5] Collier and Gunning (1999, p.78-9) notes on the African experience that "[l]ineage rules of inheritance enforced intergeneration transfer payments. The kin group was able to enforce adherence to each particular rule through the threat of exclusion from the entire package of benefits." Bates (1999, 2000) provides a general overview; see for example Snyder (1997) for specific evidence on the *Iraqw* of northern Tanzania, and Gulliver (1971) for an in-depth study of how kinship and tribal affiliation shaped interaction in Tanzania before independence.

[6] A separate literature has considered the effects of ethnic diversity on the risk of conflict and internal warfare. Bates (1999) provides an introduction to both topics.

that can hinder cooperation and voluntary contributions to local public goods, illustrating their point by a careful analysis of primary school funding in rural Kenya. While the existing literature has examined the effect of ethnic diversity on cooperative or public outcomes, such as public goods provision, we consider the effects of fractionalization on a seemingly 'private' decision: Investment in children's schooling.

The next section introduces the Tanzanian setting, including impressions from our group discussions, and section three sets up a simple model for how tribal fractionalization influences household decisions on schooling through its effects on the efficacy of social sanctions. Section four presents the data, and section five considers empirical issues related to analysis, including identification. Section six reports results and section seven examines alternative explanations. Section eight concludes.

2 Schooling and pensions in Tanzania: The setting

2.1 Education and Pensions in Tanzania

In the 1970s, under then-President Nyerere's Education for Self-Reliance program, official estimates put gross school enrolment rates for 7-13 olds at 95 %. By 1993, following years of economic decline, the official estimate was 70 %, well above our estimate of 55 %, based on data from rural areas only.[7] Compulsory schooling was re-introduced in 2001 by then-President Mkapa, and free primary schooling, funded mainly by donor agencies, has boosted enrolment rates; some concerns persist, however, about the quality of primary education.[8] The first wide-spread funded pension system was introduced in 1997 as part of a comprehensive social insurance legislation, but pension payments remain low and most people are reliant on the family in old-age and in case of economic hardship.

2.2 Impressions from group discussions

Our empirical observation that tribal fractionalization, through informal institutions and social norms, affects schooling can, as noted above, have many different explanations. To help us identify potential alternative explanations for the observed association between tribal fractionalization and schooling, to distinguish among hypotheses that are observationally equivalent in the reduced form econometric work and, if possible, to assist us in evaluating the relative merit of these hypotheses, we conducted a series of group discussions and semi-structured interviews in twelve KHDS villages in the Kagera District in Northwestern Tanzania in 2005, working

[7] See Buchert (1994) on the education in Tanzania. Numbers are from Gibbon and Raikes (1995).

[8] Milton Nkosi: "Tanzania looks beyond free schooling." BBC News Africa, July 15, 2005.

with the team that collected a new round of KHDS data in 2004.[9]

The quantitative data employed in the empirical analysis dates back to the early 1990s, while the group discussions were conducted in 2005. The main change in the intervening period is the re-introduction of compulsory schooling noted above, and all groups invariably stated that primary schooling has become common for everyone, which was not the case before. Respondents also argued that this to some extent also has diminished the value of primary schooling, and increased the need for secondary schooling.

When asked to discuss the value of schooling, a standard reply was that schooling is for the benefit and development of the child, but a frequent additional explanation was often given: one man argued that "if you sow maize, you don't only want to look at the flower, you also want to harvest" [Cluster 19, item 2]. Generally, (primary) schooling is seen as a better investment than giving the child land, as "it is better to give education than to give a shamba, with education a child can buy himself many shambas." [Cluster 4, item 2]. A major motivation for schooling is to make the child self-reliant and thus no longer a financial burden to the parents, but there was also a clear expectation in the villages that formal education, in particular secondary schooling, leads to migration and, not least, remittances. When asked to rank profiles of children with different educational levels, less educated children and children staying nearby were expected to help with household chores (washing clothes, field work) while educated children, in particular those with secondary schooling, were expected to remit cash.

In general, (older) boys would receive priority in schooling investments, as girls by Tanzanian custom become part of their husband's family, and returns on education, as a result, will not accrue to the household; there was some disagreement about the latter point, though. In particular, girls were portrayed as more caring for their family, and examples were given of daughters favouring their parents over her husband's parents. At the same time, pregnancy was often mentioned as a reason both for girls dropping out of school and, as a result thereof,

[9] Documentation is found in Lassen and Lilleør (2008). Discussions were carried out in twelve villages, selected among the KHDS villages to achieve a balance between high and low fractionalization villages. We did two rounds of pre-testing of the focus group discussion (FGD) questionnaire, one in a high TF village and one in a low TF village, with subsequent adjustments to the questionnaire. The final questionnaire (available in Lassen and Lilleør, 2008) is a mixture of open-ended and exploratory questions, group assessments of likelihoods (e.g. for migrating and remitting for types of children), and closed form factual questions. In addition to the questionnaire, a roster of participants was taken as they arrived. We also set up procedures for reporting of the results so as to ensure a uniform reporting across villages

A typical session had a duration of three and a half hours including a break and included approximately ten villagers with some knowledge of schooling, comprising all adult age groups and both men and women, selected in cooperation with the village leader (an elected local) and the village executive officer (appointed by the central government, not local). In high TF villages selection was done so as to have members from more than one tribe present in the FGD (in Kagera, one tribe villages almost always means Haya villages, and the Hayas are often the majority tribe in more mixed villages as well; see Reining, 1967, for an in-depth study of the Haya.) All sessions were conducted with the same facilitator and the same note taker. Following each session, a subjective evaluation of the degree of overall participation, the degree of equal participation and the degree of knowledge of the participants was carried out.

for not investing in secondary schooling for girls in the first place.

According to the participants of the group discussions, the degree of sanctions or 'measures' (as they were invariably called by respondents) which can be taken against children failing to remit or help out as they are expected to varies considerably. Sanctions range from having the clan reprimand the non-remitting child [e.g. cluster 2, item 8] over imposing fines, or cursing children, to reducing the amount or the quality of land to be inherited. The most serious, and most common, sanction is to deny non-remitting children inheritance in the form of land, including access to burial grounds. In one group discussion, a respondent provided an example of a parent selling off his land when his children in Dar Es Salaam did not send remittances; as a result, the children began remitting [cluster 23, item 8]. Is such a threat credible, given that major inheritance decisions are taken after the parents' deaths? Respondents in one village agreed with the statement by one man that "the community may [...] intervene if the father can say it before his death" [cluster 4, item 8 and field notes]. When asked whether it would make a difference if a non-remitting child comes from a good cooperation village (associated by respondents primarily with homogeneous villages) as opposed to a poor cooperation village (associated with heterogeneous villages), the general response was that children from good cooperation villages should expect stronger measures: "those from villages with good cooperation will get stronger measures, because it is easy for the members to sit and discuss on the measures to be taken, while it is difficult for the village without good cooperation because it is difficult to reach the consensus." [cluster 8, item 8]. In another village, respondents stated that "all the measures depend on how the parent decides with blessings of the clan, in case they belong to the strong one" [cluster 7, item 8]. These statements support the notion that social sanctions can indeed be used as an enforcement tool by parents, especially with the help of their fellow clan/tribe members, and that this is likely to be more pronounced in tribally homogenous villages.

3 Schooling, remittances, and informal institutions

Our approach is to follow the literature on the economics of labor migration in looking at household, or broader family, strategies in devising implicit intertemporal agreements that govern the allocation of resources towards investment in education, and the link to migration and payment of remittances to the household when the migrant begins earning money in town.[10] We begin from a standard model of educational choice (e.g. Baland and Robinson,

[10] Thus, we focus on one particular set of strategies within a broader set of possible family strategies. Lucas (1997) provides an overview of studies linking migration with fertility, marriage, and risk spreading, issues we do not consider here. Regarding fertility, we find below that household sizes across homogenous and heterogenous villages are essentially identical, suggesting that it is not fertility as an omitted variable that is the cause of our findings.

2000) without any altruism. Parents make a choice between child labor and schooling in the first period, when the child is a part of the household. In our model, formal education in the form of schooling increases the probability of getting a high wage job in the urban sector. In the second period, the child, now called the migrant, enjoys consumption on its own and can choose whether or not to remit a share of its labor income to the household, which makes economic decisions in the second period. As noted by Lucas and Stark (1985), when remittances are not based on altruism alone, or at all, enforcement of the implicit intertemporal contract becomes a key issue. This enforcement is provided through the family, the tribe and the urban network (Ben-Porath, 1985) by appealing to norms, traditions and trust as well as to promises for inheritance, possibilities of land allocations upon returning to their rural home, and access to burial grounds.

In the model, the impact of informal institutions on remitters' behavior is thus based on two key assumptions: First, that non-remitters are subject to social sanctions and, second, that the efficacy of these sanctions decreases in the degree of tribal fractionalization. The first part of the argument is widely supported by anthropological and recent economic studies. Migrants are expected to remit and those who do not face sanctions upon returning to their village, for example by being denied access to land or access to burial grounds (Gugler, 1968; Connell et al., 1976; Bates, 1976, 1990, 1999; Collier and Gunning, 1999) or by receiving a reduced or no inheritance (Lucas and Stark, 1985; Bernheim et al. (1985), La Ferrara, 2007); while the exact sanctions used can differ between regions and among tribes, inheritance and access to family burial grounds was mentioned repeatedly in the group discussions as the primary instrument available to families for controlling migrants' behavior. We model such measures or sanctions as being applied without cost, which is a good approximation to the situation in rural East Africa, where disputes are often over burial rights or access to land and sanctions are relatively low-cost actions. Further, as is well known from the experimental literature, people readily apply sanctions in e.g. public goods games even if dispensing such sanctions are costly to them.

The second assumption also has support from a wide range of studies. Bates and Shepsle (1997) investigate the impact of ostracism on non-contributers to public goods in games featuring overlapping generations, and argue that such ostracism functions better within than across ethnic groups. In a similar way, Bates (1999) argues that identity generally, and ethnicity specifically, serves to facilitate beneficial economic interactions that would otherwise not have taken place and he argues that it is precisely the ability of clans or tribes to levy and uphold social sanctions that sometimes makes ethnicity a creative force in sub-Saharan Africa. Miguel and Gugerty (2005) and Miguel (2004) present empirical evidence from East Africa that more tribally fractionalized communities are less able to secure voluntary payments for local public goods, and they attribute this to the fact that social sanctions function less effectively across

tribal groups.[11]

More direct evidence comes from Miguel and Posner (2006) who, based on cross-country evidence, suggest that ethnic salience is higher in more homogenous places. If this is true also within countries, it confirms why ethnic homogeneity is important for facilitating social sanctions: if tribal or ethnic salience is low in heterogenous places, upholding norms and social sanctions related to remittances is difficult, while tribal affiliations are very much a part of daily lives in homogenous places. In a similar spirit, Ross and Weisner (1977) argue that the strength of networks in the sending community affects the scope for sanctions. Recent experimental evidence also supports the idea that the detrimental effect of ethnic diversity on public goods provision is through a lack of shared social norms and an inability to carry out social sanctions. Habyarimana et al. (2007) experimentally test competing explanations for the lack of success in providing public goods in heterogenous groups. They carry out the test in a heterogenous community in Kampala, and find no support for preference-based and team-work explanations, but conclude that ethnically homogenous communities "possess both norms and networks that facilitate the sanctioning of community members who fail to contribute to collective endeavors." (Habyarimana et al. 2007, p. 722). Further, they find that players cooperate more under the threat of sanctioning, that enforcers punish players when enforcement is costly, that they punish defecting co-ethnics more than defecting non-co-ethnics and that this is particularly true when a co-ethnic defects in a game with another co-ethnic. This supports our assumption that villagers of another tribe are less likely to participate in the sanctioning of a non-remitter.

Finally, this assumption is also supported in our own data, to which we return in more detail below: Survey evidence from 69 villages reveals that a village-level average of 'trust in family members' is negatively correlated with tribal fractionalization, as is a village-level average of 'trust in fellow tribesmen'.[12] This supports our measure of lack of cooperation potential, the validity of which could be weakened if intragroup relations strengthen as inter-group differences become more pronounced.

[11] In formal models of these issues, the relation between ethnicity and punishment strategies in the forms of social sanctions is rarely modelled directly but rather assumed, as we do below. In a related setting, however, La Ferrara (2003) considers a microfounded model of credit in a dynastic environment, where punishments for failure to repay loans are levied on dynastic descendants, endogenously making repayment an equilibrium response.

[12] p-values for the correlations are .006 and .154, respectively. Data from the SCPS, described in the section on data below. We also find 'unity of the village', 'spirit of participation in the village' and 'group functioning' to be significantly negatively correlated with tribal fractionalization across the 69 villages, findings which are confirmed in our group interviews where participants generally agreed that villages with one tribe (homogenous villages) had better cooperation than mixed tribe villages, and that villages with good cooperation were generally thought to be better able to 'sit down and discuss' appropriate measures to be taken against non-remitters (field notes, cluster 19).

3.1 The model

The household lives for two periods, 1 and 2, and receives exogenous income A in each period. The household H has a life time utility function, with a concave Bernoulli utility function v over income. The household has a representative child, and we model the choice of schooling as a continuous variable $b \in [0,1]$, where $b = 1$ is full time schooling, for example through to a completed secondary school degree, and $b = 0$ implies no schooling.[13] The costs of education, and subsequent migration, including uniform costs, school fees and relocation expenses, are denoted e. Schooling increases the chance of getting a formal sector job. Denote by $p(b)$ the probability of getting a formal sector job as a function of human capital accumulation; we assume that the probability of becoming employed depends positively on the level of schooling such that $p' > 0$. Child labor yields a wage w^T per efficiency unit. This wage is normalized to one.

The household wishes to maximize expected lifetime utility, subject to the costs of educating children and subject to the determination of the level of remittances taking place in the second period. Hence, the household's maximization problem is

$$\max_{b \geq 0} v(A + (1-b) - be) + Ev(A, R; b) \tag{1}$$

$$Ev(A, R; b) = p(b)\, v(A + R) + (1 - p(b))\, v(A)$$

where R is the level of remittances determined by the migrant in the second period.

In the second period, the migrant M gets a formal sector job, with wages w^H, with probability $p(b)$, or an informal sector job, with wages $w^L < w^H$, with probability $1 - p(b)$. If he gets a formal sector job or other employment with high wages, he is expected to remit a part of his earnings to the household. If he does not obtain a high income, he is not expected to remit. We model this in the following simple way: Expected sanctions are a function of remittances $R \geq 0$ and carry a utility cost to the migrant, denoted $\psi\left(\bar{R} - R\right)$, where $\psi(0) = 0$ (if remittances equal $\bar{R}$), $\psi' > 0$. This is the first assumption referred to above. However, in practice the ability of the rural community to 'sit down and discuss appropriate measures' depends in part on the civil society of the rural village. We model this by including the term $q(TF)$, where q is the probability that such measures are implemented and $q' < 0$ captures that this probability decreases in the degree of tribal fractionalization; hence, with probability $1 - q$ measures are not implemented and utility cost is zero, and if no measures are taken, expected utility cost is zero. This is the second assumption referred to above.

[13] We abstract from the household's choice of education for the *group* of children; modelling this empirically using a count data model yields similar results. In practice, there is wide variation in the years of completed schooling. In the Kagera data, migrant children report years of completed schooling and there is positive support for the full range of school years from 1 to 11.

Based on this, the migrant solves

$$\max_{R\geq 0} p(b)\left[u\left(w^H - R\right) - q(TF)\,\psi\left(\bar{R} - R\right)\right] + (1 - p(b))\,u\left(w^L\right)$$

In that case, the first order condition[14] for an interior solution R^* becomes

$$u'\left(w^H - R^*\right) = q(TF)\,\psi'\left(\bar{R} - R^*\right) \text{ if } R^* > 0 \tag{2}$$

and for the corner

$$u'\left(w^H\right) > q(TF)\,\psi'\left(\bar{R}\right) \text{ if } R^* = 0. \tag{3}$$

The first order condition implicitly defines optimal remittances R^* as a function of tribal fractionalization, TF. Knowing the level of remittances in the second period given a high wage income, parents now solve (1). We assume that there is an interior solution to this problem, characterized by the first order condition[15]

$$v'(A + 1 - b(1+e))(1+e) = p'(b)\left[v(A+R) - v(A)\right]. \tag{4}$$

We can now determine the effect of the community's ability to sanction non-remitters, characterized by the tribal fractionalization of the village, on the amount on schooling as

$$\frac{db}{dTF} = \frac{db}{dR}\frac{dR}{dTF}. \tag{5}$$

Straightforward differentiation of (2) and (4) yields[16]

$$\frac{db}{dR} > 0 \text{ and } \frac{dR}{dTF} < 0$$

[14] The second order condition for a maximum is

$$u''\left(w^H - R^*\right) - q(TF)\,\psi''\left(\bar{R} - R^*\right) < 0$$

which is satisfied if $\psi'' > 0$ or not too negative. We assume this to be the case.

[15] Again, the second order condition for a maximum is that $v''(A+1-b(1+e))(1+e)^2 + p''(b)\left[v(A+R) - v(A)\right] < 0$ which is the case for example if $p'' \leq 0$.

[16] The expressions are, respectively,

$$\frac{db}{dR} = \frac{-p'(b)\,v'(A+R)}{v''(A+1-b(1+e))(1+e)^2 + p''(b)\left[v(A+R) - v(A)\right]} > 0$$

and

$$\frac{dR^*}{dTF} = \frac{-q'(TF)\,\psi'\left(\bar{R} - R^*\right)}{u''\left(w^H - R^*\right) - q(TF)\,\psi''\left(\bar{R} - R^*\right)} < 0.$$

which yields

$$\frac{db}{dTF} = \frac{db}{dR}\frac{dR}{dTF} < 0. \tag{6}$$

Thus, increasing tribal fractionalization decreases the risk of being sanctioned by the community, which decreases remittances sent. Households, recognizing this, respond by spending less on education in the first period. If $R = 0$ in the corner solution, there is no return on the investment b and, in the absence of altruism and schooling laws, the optimal choice of b is zero.[17]

In sum, this simple model predicts a reduced form causal relationship between village level tribal fractionalization and schooling decisions. However, as noted in the introduction, there exists a number of potential explanations that could account for such an empirical relationship between tribal fractionalization and schooling. To discriminate between these competing explanations, we utilize the additional structure provided by the model in the decomposition (5) to test the hypothesis that the causal relation from tribal fractionalization to schooling is based on the intergenerational contract, whereby social norms and the scope for social sanctions govern payment of remittances, which in turn influences the household's decision to invest in schooling in the first place. We defer the investigation of alternative explanations to section six, below.

4 Data

We employ several data sets from Tanzania to investigate the hypothesis that tribal fractionalization affects schooling decisions, and that it does so through the intergenerational contract. This section describes the quantitative data, which consists of several large-scale household surveys.

4.1 Quantitative data sources

Our main sources of data are two large-scale household data sets from Tanzania, both collected in the early 1990s. One is a nationally representative cross-sectional survey of 5184 households from 1993-94, the Human Resource Development Survey (HRDS); the other is a detailed regional four wave panel survey of over 800 households in 51 clusters, the Kagera Health and Development Survey (KHDS), carried out in the Kagera region of Northwestern Tanzania from 1991-1994 at six month intervals.[18,19] Both data sets sample rural households with school-aged

[17] Compulsory schooling laws were considerably strengthened in Tanzania in the late 1990's, after the period from which our data stems. Our group interviews confirm much more widespread education than 10 years before.

[18] Both data sets are collected by the World Bank as Living Standards Measurement Surveys (LSMS). They can be downloaded from http://www.worldbank.org/lsms/

[19] Kagera borders on Rwanda and experienced a large inflow of Rwandan refugees following the 1994 genocide (see Center for the Study of Forced Migration, 2003). Our village-level measures are based on the first wave of the survey, carried out in 1991-92, and are not affected by the mid-1990s refugee situation in Tanzania.

children, but only the KHDS includes information on migrant children. We use the HRDS data set whenever feasible, as it is both a much larger data set and nationally representative.

Our main empirical investigation is based on the HRDS, and this data set also allows us to test three out of four alternative explanations referred to in the introduction. However, when investigating our hypothesized causal path, that the negative effect of TF on schooling stem from lower levels of remittances and weaker intergenerational contracts between migrant children and their parents, we have to use the more detailed regional survey as well as our qualitative data, both from Kagera. In the KHDS, extraordinary care was devoted to collecting data on children of the household living elsewhere. This includes their geographical location, level of education, employment status and, not least, their level of remittances. This is unusual for household surveys, which typically collects information only on current household members.

Finally, we also make use of a third data set, the Social Capital and Poverty Survey (SCPS) collected in 1994-95 in most of the rural HRDS clusters.[20] It is therefore possible to merge HRDS and SCPS data at the village level, although the households surveyed are not identical. We use the SCPS data for analyzing and testing some of our alternative explanations.

4.1.1 Sampling

The sampling in the HRDS is based on the sampling frame of the National Master Sample collected by the Tanzanian Bureau of Statistics. It uses all the 222 clusters of the National Master Sample, 100 of which are rural villages while 122 are enumeration areas in urban settings. Within each cluster, 20-25 households were sampled at random, see Ferreira and Griffin (1996).

KHDS was originally collected to measure the impact of adult mortality and morbidity on the welfare of individuals and households. Kagera was chosen mainly because it was the epicenter of the East African AIDS epidemic. The sampling of KHDS therefore focused on oversampling households with high probability of adult mortality. This resulted in a two-stage stratified random sample, where the stratification was done over agronomic zones at the cluster level and over joint morbidity and mortality status at the household level. This resulted in 51 clusters of 16 households in each, out of which 14 households were characterized as 'sick' and 2 households as 'well' during the enumeration. Such a heavy stratification calls for careful consideration in any estimation analysis. However, if the stratification is based on variables exogenous to the question of interest, it can be ignored in the sense that any M-estimator will produce consistent estimates and allow for valid inference (Wooldridge, 2002). We test for differences in results between 'well' and 'sick' households when using the KHDS data and find no effects.

[20] SCPS was also collected by the World Bank, but not as part of the LSMS set-up.

4.1.2 Tribal fractionalization measure

We measure the strength of informal institutions by the degree of tribal fractionalization. We focus on tribal affiliation rather than clan membership, as we have no data on the latter and recognizing, with Horowitz (1985, p.60), that "[t]here is no bright line to be drawn between kinship and ethnicity, especially in societies where the range of recognized family relationships is wide and the importance of kinship ties is great." For a village k, the value of the tribal fractionalization index TF is given by

$$TF_k = 1 - \sum_{h \in H_k} \theta_{hk}^2$$

where θ_{hk} is the population share of tribe h in village k, and H_k is a partition of tribes in village k such that the tribal shares sum to one in each village. The tribal shares θ_{hk} are village level estimates based on individual household responses in HRDS; while the empirical analysis below concentrates on households with school age children, the estimates of the tribal shares are based on the entire, substantially larger, HRDS sample. Figure 1 shows the distribution of villages with respect to the fractionalization measure, both in total and for rural and urban areas separately.

< Figure 1 here >

In the empirical specification below, we follow the recommendation by Vigdor (2002) by including also tribal population shares on their own. Excluding tribal shares would imply the behavioral restriction that all tribes have the same propensity to invest in education, regardless of the tribal composition of their village. It could be the case that some tribes, possible for reasons of tradition or degree of modernization, are more prone to investing in formal education, and we capture this by including the individual shares.[21] As we note below, the individual tribal shares are jointly strongly significant, also if we include the TF index.

5 Empirical specification and identification

The simple model above yields several testable empirical predictions, two of which stem directly from the first order conditions for schooling (4) and for remittances (2), respectively. These first order conditions can be directly translated into reduced form regressions.

Empirically, we model the household's choice of education based on (4) as a binary variable, which equals one if a school-aged child is enrolled in or has completed primary school, zero

[21] Some tribes have more traditions for migration, a necessary part of education paying off (Connell et al. 1976, ch. 2) while there are also differences between tribes in their propensity to carry out punishments (McElreath, 2004).

otherwise.[22] The reduced form is estimated as a standard logit model, where a child is enrolled if the optimal b from equation (4) is greater than or equal to the equivalent of seven years of primary schooling, $\underline{b}$. We know from the first order condition that b can be characterized as a function of direct and indirect schooling costs, household income in period 1 and period 2, the urban employment probability function and tribal fractionalization through future remittances. To the extent possible, these variables, or their close proxies, are included in the regression model, along with a range of control variables, $\mathbf{X}$, which have been found to affect the choice of schooling or might control for some of the unobserved future variables. Our main estimating equation, the schooling regression, is given by

$$prob(b \geq \underline{b}) = \Lambda(\alpha_0 + \alpha_1 e + \alpha_2 w^T + \alpha_3 A_1 + \alpha_4 TF + \boldsymbol{\beta}\mathbf{X}). \tag{7}$$

Based on the model, our hypothesis is that $\alpha_4 < 0$. The estimation of (7) is based on a sample of all children of household heads between 7-17 years of age[23] drawn from the Tanzania-wide HRDS data set. Households base their schooling decision on their expectations about future remittances. This implies that there are two underlying conditions which must hold for the schooling first order condition, and thus the reduced form regression above, to be valid. First, an underlying assumption of the model is that the probability of formal employment must be increasing in b, i.e. $p'(b) > 0$. Second, the degree of tribal fractionalization must have a negative effect on remittances, $\frac{dR}{dTF} < 0$. Both of these conditions relate to second period variables for the migrant child. These are necessary, but not sufficient, conditions to identify the model. To investigate these second period relations, we turn to the KHDS data with its detailed information about migrant children.

We investigate the assumption that $p'(b) > 0$ by simply regressing the probability of formal employment on the level of schooling of the migrant along with controls for age, gender, and geographical location, $\mathbf{W}$. We focus on formal employment which guarantees the migrant a monthly wage as the distinction between unemployment and self-employment (e.g. as petty-trader) or informal jobs is often very blurred in developing countries. We find this to be the case – primary schooling increases the chances for formal sector employment in a strongly significant way, as does secondary schooling.[24]

The second condition which must be satisfied for our main regression to be a valid reduced form of the model relates remittances to the degree of tribal fractionalization; the migrant's

[22] School enrolment reflects the long run decision of the parents, whereas recent school attendance is subject to temporary fluctuations in household resources. Enrolment is also preferred over school attainment to ensure a reasonable link between schooling decisions and current income levels.

[23] Since school enrolment is often delayed, we widen the official school age with two years from 7-17 rather than 7-17 years. We are not including foster children, or other children not directly related to the household head, as their intergenerational contracts will be different. The sample is drawn from the Tanzania-wide data set, HRDS. Results are replicated using the KHDS data with the same sample selection.

[24] Results are enclosed as table A.3.

first order condition (2) implies that $\frac{dR}{dTF} < 0$. This translates into a regression of the level of remittances on employment status, and the probability that sanctions for non-remitting migrants are invoked, which depends on the time invariant variable TF. We estimate this as a censored (or corner-solution) Tobit model, since we frequently observe remittances equal to zero. The censored Tobit is set up in terms of a latent variable, where the optimal amount of remittances for each individual is

$$R_i^* = \delta_0 + \delta_1 w_i^H + \delta_2 TF + \boldsymbol{\gamma}\mathbf{Z}_i + u_i,$$

where $\mathbf{Z}$ is a set of control variables, including individual, household and village characteristics. The model predicts that $\delta_1 > 0$ and that $\delta_2 < 0$. A necessary identification condition of the model is thus that we do not reject $\delta_2 < 0$. In principle, R_i^* can be negative if the migrant would like to receive remittances from the family, but since this is not the migrant's decision to make and we do not observe such wishes, R_i^* is censored at the corner solution zero; in the data, we observe $R_i = \max(0, R_i^*)$. The conditional expectation of R given our explanatory variables is then a composite measure of the probability of remitting and the expected value of remittances, given that the migrant child is remitting.

$$E(R|w^H, TF, \mathbf{Z}) = prob(R > 0|w^H, TF, \mathbf{Z})E(R|w^H, TF, \mathbf{Z}, R > 0) \tag{8}$$

We will primarily model the level of remittances as a Tobit model, which assumes homogeneity and normality about the error term u_i for the δ-estimates to be consistent. To get additional insights into the nature of remittances, we use a hurdle model, which is a decomposition that essentially corresponds to a joint result of a probit model of the probability of remitting and a linear regression of the conditional expectation of the level of remittances in the uncensored part of the sample.

5.1 Identification

In the regression analysis below, we estimate investment in schooling and payment of remittances on tribal fractionalization. For the resulting estimates to be interpreted as causal effects, we need to consider identification of the empirical model. First, the tribal fractionalization of a village could be endogenous to school quality or variables related to this. Second, estimates of α_4 in (7) could represent effects of other slow-moving village level variables on schooling and remittances rather than TF having an effect of its own.

Regarding the first concern, we can rely on the historical fact that there has been relatively stable tribal settlement patterns in rural Tanzania since the mid-1970's. Most villages in rural Tanzania were established well before colonial rule ended, and from the mid-1970's up to the

early 1990's, which is when the surveys that we employ were collected, mobility was limited in Tanzania, though not non-existent, as has been the case in neighboring Kenya (see Miguel, 2003). The villagization program, *Ujamaa*, carried out in the mid-1970's, forced some rural residents to move to other, often newly constructed, villages and in the following period rural mobility has been severely restricted, to have increased only recently. This, in itself, suggests that migration into *rural* communities, which are the focus of our investigation, has been limited.

This is confirmed by data from the SCPS, where respondents were asked to rate whether they perceived migration into their community as high. We code a village to have high frequency of migration if more than a third of the respondents in the village think so. Even with this generous definition, only nine percent of villages were classified as having a high frequency of migration. There is no significant difference in the migration pattern across more and less heterogenous villages, and excluding the high frequency villages from the analysis below does not change results, see bottom panel of table 1 below.

Regarding the second concern, which is also related to possible alternative explanations to which we return in section seven, we include a wide range of village level controls in the estimating equations. As a more direct and transparent preliminary investigation, in table 1 we compare the most homogenous quintile of HRDS/SCPS villages with the most heterogenous quintile across a number of variables that could be related to tribal fractionalization. Correlations across the full sample yields similar results, but the comparison in table 1 facilitates interpretation. The table reports mean values for the characteristics for the two groups of villages, as well as the difference and the resulting t-test values.

< Table 1 here >

The table suggests a well-balanced sample for household expenditure and hectares of land owned with respect to tribal homogeneity, but household size (and thus fertility) is significantly higher in low TF villages. As for our alternative explanations, there is also support for some of these. There is no direct evidence that perceived school quality is consistently higher in low fractionalization villages, nor are there any significant differences in term of schooling expenditure or school distance between high and low TF villages. Only among school supplies do we find a very marginal difference in favour of low TF villages. This is as expected and found by Miguel and Gugerty (2005) for Kenya. There is more support for the informal credit and land scarcity explanations. In low TF villages, 21 per cent of the households report that if they faced a sudden credit need of approximately 100 USD, then they would first ask their family, friends or relatives for assistance, as opposed to pawn shops, local traders, banks or credit cooperatives. This is almost 10 percentage points higher than in high TF villages and the one sided t-test is also clearly significant with a p-value of 0.04. Likewise, 43 per cent of

households in low TF villages report that land is very difficult to obtain (although there is no significant difference in number of ha of land owned), and 26 per cent of households that it is mainly acquired through inheritance.[25] These numbers are also significantly higher than in low TF villages. This shows the importance of also testing the significance of these different variables in the schooling regression along with TF. Including these variables as controls will ensure that their effects on schooling are captured separately from any effect of TF.

6 Results

6.1 Schooling, informal institutions and tribal fractionalization

The results from the estimation of the relationship between school enrollment and tribal fractionalization (equation (7)) is shown in table two, with standard errors corrected for clustering at the village level in parentheses. Model 1 includes a constant, the tribal fractionalization index, TF, and controls for the tribal population shares at the village level. This simple model shows that there is a significantly negative effect of TF on the probability of a child being enrolled in school; model 2 adds regional controls, which does not affect the estimated effect of TF; in any case, the magnitude of this estimated effect is likely to be biased due to omitted variables.[26]

Model 3 includes a set of key explanatory variables, some originating from the theoretical discussion above, some being standard controls in the literature on school enrolment. These include the household expenditure level as a measure of the household's resources,[27] and measures of direct and opportunity costs of schooling. The latter are present if a household owns land, has direct agricultural income, or has a herd, in which case the need for (possibly, part time) child labor is higher, increasing the opportunity cost of educating children formally.[28] Additionally, distance to school matters as children who spend more time travelling to school are less available for part-time work, such as fetching water or caring for younger siblings. Furthermore, we include prospects of non-agricultural employment (measured by the proportion of the adult village population in formal or informal employment).

[25] As several group discussants noted, parents have an obligation to give their children either a shamba (a plot of land) or an education (and sometimes both). If land is scarce, the only possiblity for giving your children a piece of land is by subdividing your own shamba, which would show up in the data as a smaller average shamba size.

[26] The corresponding summary statistics are shown in Table A1 in the appendix

[27] The effect of household incomes on the child labor vs. schooling choice is not unambiguous. See Baland and Robinson (2000) and Rogers and Swinnerton (2004).

[28] Land and herd ownership can influence the choice of education in other ways as well. As noted by Lucas and Stark (1985), households with inheritable assets receive more remittances. In our framework, household assets can be used in the bargaining over remittances to increase the flow of funds from migrants to parents, increasing the expected return on schooling.

< Table 2 here >

Finally, model 4 includes school quality indicator variables to control for the effects identified by Miguel and Gugerty (2004) that ethnically diverse communities in Kenya are less successful in securing voluntary contributions for funding primary schools, which could conceivably affect perceived quality of such schools. In our case, however, including school quality variables affects the estimated effect of TF only marginally, echoing the small differences across homogenous and heterogenous villages observed in table 1.

The estimated coefficients on tribal fractionalization are reasonably stable across the specifications, and the TF coefficient is negative and significant at the 5 % level throughout. Based on model 4 in table 2, the marginal effect of increasing tribal fractionalization equals -0.23; thus, increasing tribal fractionalization by one standard deviation (.26 in our sample) lowers the probability of being in school by 6 percentage points. The remaining explanatory variables all have the expected sign, but a few are insignificant. The level of household expenditures has a positive significant impact on the schooling decision, but it is reduced when the main income source is agricultural and children thus are needed for help; a similar conclusion comes from the negative effect of the household having a herd. Furthermore, girls are enrolled in school more often than are boys, while a greater distance to school, measured as the average at the cluster level, decreases school enrollment.

Table 3 shows results divided by gender. The effect of TF on schooling is larger for girls than for boys, as there is more variation in the schooling of girls, but both estimated effects are significant and sizeable. Additionally, we see that it is the education of girls that drives the result on income. The education of girls thus seem to be somewhat more of a luxury decision, made when there are funds for it. This is confirmed by the group interviews, where the education of boys is always preferred over the education of girls, partly because the education of girls is perceived to be associated with more risk for two reasons: first, girls might get pregnant when attending school (especially secondary school) and subsequently drop out; second, once married, the obligations of a woman lie primarily with her husband's family and not her own. Her parents can therefore not expect or demand assistance from her, but only hope for it.

< Table 3 here >

As for the marginal effects of TF on the schooling probability of girls and boys, the effects remain significantly negative and of the same order of magnitude; the probability of school attendance of girls is reduced by almost 25 percentage points and of boys by 20 percentage points when moving from a complete homogenous village to a heterogenous village. The results are thus robust to choice of specification.

The result that increasing tribal fractionalization decreases the probability of school enrollment is the first step in showing how informal institutions influence the intergenerational

contract. We now turn to the second step, examining in more detail the more specific partial derivatives predicted by the decomposition of the reduced form relationship.

6.2 Remittances and tribal fractionalization

Out of the 714 rural households observed in the first wave of KHDS, 76% of all households received remittances within the past 12 months of the interview, and 52% of all households have received remittances from Children Living Elsewhere (CLE), i.e. individuals about whom we have additional information such as educational background and economic activity. There is a significant positive difference between remittances sent from children with primary education or more and children without education, confirming that households are rational when expecting remittances to increase with education; we return to this below.

We also find that there are significant positive differences in the proportion of households receiving remittances in low TF villages compared to high TF villages; this is the case both for all remittances received and for remittances from children. In the most homogenous villages, the average proportion of households receiving remittances is 76%, and 53% of households receive remittances from their children, compared to average proportions of 69% receiving from anyone and 47% receiving from children in the most heterogenous villages. This is supportive of our second assumption, and is confirmed in the regression analysis below.

For the regression analysis, we focus on the migrant's decision to remit to a household in his or her village of origin. For sample migrants who live within the region of Kagera, 12 % ($n = 1309$) remitted in the past six months of the survey, while for migrants living outside of Kagera, 22 % ($n = 554$) remitted. However, migrants living nearby often assist families in various ways beyond, or instead of, monetary remittances, types of assistance which are substitutes for monetary transfers, but not captured by the survey used here. Thus, including nearby migrants with faraway migrants can bias results related to monetary remittances. As a consequence, we focus on the sample of migrants outside of Kagera, as they do not have the opportunity of providing in-kind assistance to the same extent. At the same time, there is ample evidence that migrants, and in particular migrants to faraway towns, are a selective sample (Stark, 1991). While we do control for available individual characteristics, it remains likely that migrants leaving Kagera are different from those staying put on a number of, possibly unobservable, dimensions. This provides another reason for focusing on the sample of migrants outside of Kagera.

Table 4 relates the payment of remittances by migrants to characteristics of the individual CLE, the recipient household, and the village of the recipient household, see equation (8) above[29]. As noted in the introduction, most of the economic literature on remittances has fo-

[29] The corresponding summary statistics are shown in table A2 in the appendix.

cused on sender and recipient characteristics, while some work in demography has also included a limited selection of village-level characteristics.[30] We base our choice of control variables on the standard of the remittances literature (see, e.g., Vanwey, 2004), but include also additional village level characteristics that can be thought to influence the intergenerational contract, including various inheritance rules and traditions.

< Table 4 here >

In the sample of migrant children living outside Kagera, 78 % choose the corner solution of no remittances in the first wave (equation (3) above). This number increases in subsequent waves due to the very short time span of six months between each wave. The censoring means that OLS estimation will produce inconsistent estimates, but the OLS results reported in table 1, model 1, nevertheless provide a benchmark for more complex models, and, furthermore, assists us in assessing the appropriateness of subsequent specifications below. For now, we simply observe that the negative estimated effect of TF is statistically significant.

In reality, remittances are either positive (interior solutions) or zero in the corner solution. Model 4.2 present results from a Tobit model, which allows for corner solutions in a natural way. In this specification, the estimate on TF is negative and strongly significant, consistent with parents in more heterogenous villages expecting remittances to be lower. The overall effect is not big: Increasing TF from the minimum to the maximum in the sample, 0 to .66, increases the (latent variable) amount paid by 1100 shillings, the equivalent of USD 2.40; note, however, that this is the amount sent within the last six months, meaning of course that the total return is much larger. The low magnitude of the (latent variable) estimate reflects the substantial mass point at zero. If we look at the two marginal effects separately, we find that the marginal effect conditional on paying is indeed quite small, while the effect of TF on the probability of receiving a positive amount (which can be calculated from the probit model, described below), as compared to zero, is reasonably large; increasing TF from 0 to .66 decreases the probability of observing positive remittances by 8 percentage points.

The results on controls are also of interest. First, we note that having a formal sector job and completed primary or secondary education strongly increases the probability of sending remittances. We obviously encounter the problem that TF can have influenced schooling in the first place, as demonstrated above, but our estimate of the direct effect is not greatly affected by the in- or exclusion of the schooling variables. The main effect of excluding the schooling variables is that TF becomes significant at the 1% level.

In addition, girls remit more than boys (but see below), and households with more land receive more remittances. Households in communities with mutual aid among farmers, possibly

[30] Denoted "contextual effects" in the demography literature, such village level characteristics often include history of migration or village level measures of economic conditions.

representing higher social capital or cooperation in general, receive more remittances. This is consistent with remittances being sent not to alleviate household idiosyncratic income shocks, but rather to be in good standing with the community. The same interpretation can be applied to the result that households in communities that have experienced inheritance disputes in the past year receive higher remittances: if inheritance rules are not fully agreed upon, it can be important to maintain a good relationship with the household (see also Lucas and Stark, 1985). Overall, remittance patterns differ somewhat between tribes, and in general remittances decrease from the first wave to the subsequent three, reflecting that in the first wave respondents were asked about receiving remittances in the past 12 months, while subsequent waves asked about remittances in the past six months.

6.3 Robustness

In model 3, table 4, we model the sending of remittances as a binary decision, equal to one if remittances are sent and zero otherwise. We estimate this using a probit model; again, TF enters in a negative and statistically significant way. This specification also allows us to assess the appropriateness of the Tobit-model. Under the assumption of normality, $\gamma \equiv \beta/\sigma$ where γ is the coefficient on TF in the probit specification, β the corresponding coefficient in the tobit specification and σ the standard error of the tobit (see, e.g., Wooldridge, 2002, p. 521). Using the estimation counterparts, we find that $\hat{\gamma} = -.98$ and that $\hat{\beta}/\hat{\sigma} = -10.48/11.10 = -.94$, which does not suggest misspecification of the tobit model. As another check, we note that the share of observations with positive remittances ($= .13$) multiplied by the tobit estimate on TF (-10.48) yields -1.36 which is quite close to the OLS estimate of -1.07, as should be the case under assumptions of joint normality under censoring from below at zero (Wooldridge, 2002).[31]

In model 4, table 4, we estimate an OLS model conditional on remittances being positive. The size of the estimated coefficient is roughly as in model 4.1, but the standard error somewhat larger as the number of observations has dropped by almost a factor of 10. Models 4.3 (probit) and 4.4 (OLS conditional on sending) together approximate a hurdle model, which allows for the effects of the explanatory variables to differ between the qualitative choice of choosing no or positive remittances, and the quantitative choice of choosing the amount of remittances.[32] We find that TF affects negatively both the decision to send remittances at all and the decision on how much to send, conditional on sending, which accords well with the corner solution structure of the model; the estimated coefficients suggest, as discussed above, that the quantitatively

[31] Additional specification checks for heteroscedasticity were carried out based on the probit model. We found little evidence of heteroscedasticity, and in the few case where some was present, notably primary education and formal sector jobs, it did not affect results.

[32] Alternatively, we could have modelled the continuous sending decision by a truncated regression model; this strengthens results on TF somewhat, but have no other effects.

important effect is on sending vs. non-sending rather than on the amount sent. While the smaller sample of the conditional OLS model requires careful comparisons, some variables are seen to affect the decisions whether to send and how much to send in different ways. In particular, girls tend to send at a much higher frequency than boys, but they send smaller amounts; thus, the sign on girls is positive in the binary sending model, while it is negative, albeit insignificant, in the model of how much to send. While beyond the scope of this paper, the hurdle model suggests that the factors affecting the act of sending remittances at all, which signals a willingness to send, can be different from the factors determining the amount sent.

7 Alternative explanations

A number of alternative explanations for the observed reduced form results exist: First, consider the role of urban networks. Urban networks can be important by helping arriving migrants get housing and work, and networks can also monitor migrants and remind them of their obligations towards those at home. Thus, strong urban networks increase the expected return on schooling and migration. If the functioning of urban networks is better when they are rooted in more homogenous villages, stronger urban networks, rather than a higher risk of sanctions, could explain the observed relationship between TF and schooling. We cannot observe the number of migrants in a city that come from a particular village, but one direct test for the influence of home village tribal fractionalization through urban networks is to model the probability of getting a formal sector, high paying job as a function of TF directly. While we find that schooling dramatically increases the probability of getting a formal sector job, as discussed above, we find no significant direct effects of TF (table A.1). Respondents in the group discussion were generally sceptical of urban networks acting on behalf of village households, arguing for example that securing remittances is not an objective of the network, and that information about individuals' behavior is generally not available [Cluster 2, item 8].

Second, from our group interviews it became clear that ethnically homogenous villages are often associated with being ancestral villages, where land is scarce, whereas heterogenous villages could be of more recent and uncertain origin and have a higher degree of land availability. Therefore, if parents are faced with the choice of either giving their child a plot of land or an education (cf. note above), the relative cost of providing children with a shamba would be lower in villages where land is available, which may happen to be where tribal fractionalization is high. We cannot observe village age in our data, but we do observe individual and average land holdings. In table 1, we saw that average shamba sizes were approximately equal across homogenous and heterogenous communities, and we control for household land holdings in regressions. For the detailed Kagera data, the bivariate relationship is in fact the opposite: more homogenous villages also have larger land holdings, which would tend toward choosing

less schooling for the children of the household.[33] Table 5 shows results from including into the main specification additional explanatory variables. While the first column reproduces our main choice of specification from table 2, columns 2 and 3 include, respectively, a measure of limited land availability and an indicator variable for land being mainly inherited. Neither of these are significant, and interactions with TF does not suggests any such effects.

< Table 5 here >

Third, living in an tribally homogenous village can increase the probability that a household hit by a negative shock receives assistance from fellow villagers, as part of an informal insurance system. At the same time, it can facilitate cooperation on sending children to school or funding migration for educated children. While a full investigation of the relationship between credit availability, insurance and tribal fractionalization is beyond the scope of this paper, we do have some evidence on (the lack of) a relationship between these. From table 1 we see that there are marginally better informal credit opportunities in the most homogenous villages compared to the most heterogenous villages, but as seen in model 4, table 5, this result does not carry over to a regression framework; the effect of informal credit availability is itself insignificant in the schooling regression, and does not affect the estimated effect of TF.[34] Furthermore, we could not find evidence to suggest that the effect of TF on schooling depends on the availability of credit opportunities; interacting TF with household expenditures (our equivalent of A_1 in the model) did not yield any results. As already mentioned, the other part of the intergenerational contract, the payment of remittances, was not affected by the existence of local insurance arrangements, measured by the availability of mutual aid among farmers in a village, even if the latter itself in some specifications did appear to be associated with higher remittances.

Finally, tribal fractionalization could be correlated with school quality, as suggested by Miguel and Gugerty (2005) in the case of Kenya. Better school quality would increase the demand for schooling, due to an expectation of better schooling outcome and thus urban labour market prospects. As we noted above, tables 1 and 2 show that school quality does not appear to be associated with tribal fractionalization and, furthermore, does not affect the estimate of the effect of TF on school enrolment decisions.

[33] Gulliver (1961) suggests that rural land scarcity in colonial times provided a catalyst for change of inheritance rules. Less available land meant that sons had a harder time acquiring land on their own, which led to pressure on, and in turn change of, past inheritance norms by which brothers were the first to inherit. In turn, this created incentives for sons to influence the division of the inheritance, in part by remaining in good standing with the home village.

[34] In addition, group interview respondents in all villages strongly disagreed with the idea that families would jointly raise money for funding migration for particular children; this was simply unheard of.

8 Discussion

The intergenerational contract has two components: investment in schooling and payment of pensions. While intergenerational contracts in developed economies are generally managed by the state, in developing economies with weaker state structures and less fiscal capacity, intergenerational contracts are generally thought to be enforced by traditions and social norms, often rooted in tribal or ethnic affiliations. The analysis presented in this paper takes a comprehensive approach to analyzing intergenerational contracts in developing economies, including decisions on both schooling and pensions (in the form of remittances), joined together by and enforced through tribal identity.

Our findings are at odds with the notion that all traditional institutions are a hindrance to development. In rural Tanzania, it is exactly traditional institutions that help overcome enforcement problems inherent to the family bargaining underlying educational choice, migration, and remittances. If such traditions weaken, and social structures lose some of their power, the move towards more education and, ultimately, a higher standard of living, could be delayed or impaired if other institutions do not take their place. Therefore, while informal institutions would not necessarily be a part of the first best solution in a fully modernized state, they may be able to correct, at least partially, distortions arising from underdeveloped credit markets. insufficient social insurance systems and lack of fiscal capacity.

At the same time, the interconnection between tribal or ethnic identity and the provision of schooling and pensions suggests that successful government involvement in, say, basic schooling, can have implications for the informal provision of pensions as well as patterns of tribal affiliations. Conversely, policies directed at national identity or unity can have consequences for the provision of both schooling and pensions. This is important as the weakening of traditional institutions are sometimes an independent policy initiative of national governments. In Tanzania, in particular, there has been consistent efforts since the 1960's to create a nation state to replace tribal communities. While this effort has been successful in many ways (Miguel, 2004), including creating a strong national identity, the results of this paper suggest that tribal affiliation still has implications for the daily lives of Tanzanians, an impression strongly supported by our group interviews. A main reason for this, of course, is that existing authority structures such as tribes and elders do not simply sit around and wait for their authority to be challenged by government strategies aimed at replacing traditional allegiances. As noted by Bates (1999), in some parts of sub-Saharan Africa the notion that villagers must be buried in the place they were born is actually quite recent, dating from the 1970's when youth began to question the elders' authority and, hence, the reason to remit and stay on good terms with the rural community. Similarly, Snyder (1997) reports that the continuation of religious rituals among the Iraqw of northern Tanzania is closely linked to the legitimacy of political authority;

if the role of the religious ritual is weakened, so is the elders' authority which involves allocating land and settling disputes.

We see the results of this paper as a testimony to the fact that ethnicity, and more broadly identity, can sometimes help create and support important economic transactions which would otherwise not be realized due to weak formal institutions or underdeveloped markets. The absence of ethnic affiliation would not necessarily imply that more beneficial transactions would be undertaken; rather, as noted by Carr and Landa (1983), or Greif (1993) in the context of Mediterranean traders in fourteenth century Europe, existence of an ethnic identity can help sustain exchange where there would otherwise be none.

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Table 1: Differences across homogenous and heterogenous communities

Cluster means	Low *TF*	High *TF*	Difference	*t*-test	*p*-value
HRDS variables					
Household size	6.47	5.94	.52	1.84	.07
Hhd expenditures per a.e.	.80	.89	.09	1.05	.30
Land (ha)	12.21	10.59	1.62	0.91	.37
School expenditures	6.66	5.83	.83	0.67	.51
Distance to school	1.61	1.77	.16	0.57	.57
School quality variables					
Teachers good/adequate*	.73	.80	.07	1.40	.91
School supplies g/a*	.42	.36	.06	0.95	.17
Environment g/a*	.54	.50	.04	0.72	.23
Swahili lessons g/a*	.83	.90	.07	1.39	.91
English lessons g/a*	.56	.63	.07	1.47	.93
Math lessons g/a*	.73	.82	.09	1.88	.97
SCPS variables					
High migration freq.	.06	.10	.04	0.64	.52
Informal credit*	.21	.12	.09	1.82	.04
Limited land availability*	.43	.22	.21	2.03	.02
Land mainly inherited*	.26	.15	.11	2.01	.03

Note: Numbers may not add up due to rounding. Differences and t-test statistics are absolute numbers. The t-tests have 43 d.f. and are assumed to have equal variances. # clusters in low TF is 23 and in high TF is 22. *p-values are for one-sided hypothesis testing of better school quality, better informal credit opportunities and less access to land, respectively, in low TF villages. Sample is based on rural HRDS and SCPS clusters.

Table 2: School enrolment and tribal fractionalization

School logits	(1)	(2)	(3)	(4)
TF	-0.641***	-0.688**	-0.848**	-0.777**
	(0.238)	(0.282)	(0.343)	(0.339)
Age			2.018***	2.029***
			(0.140)	(0.140)
Age^2			-0.069***	-0.070***
			(0.006)	(0.006)
Birth order			-0.050	-0.043
			(0.036)	(0.036)
Girl			0.261***	0.262***
			(0.085)	(0.086)
Daily HH expenditure per AE ($)			1.083***	1.144***
			(0.412)	(0.427)
Agriculture is main income			0.239	0.235
			(0.320)	(0.331)
HH exp*Agricultural income			-0.771*	-0.805*
			(0.448)	(0.461)
School expenditure, cluster av.			0.000	-0.007
			(0.027)	(0.027)
School distance, cluster av.			-0.237***	-0.238***
			(0.087)	(0.088)
Household has herd			-0.332***	-0.345***
			(0.104)	(0.107)
Total number of children			0.064***	0.063***
			(0.022)	(0.022)
Land (ha)			0.008	0.009
			(0.006)	(0.007)
Land^2			-0.000	-0.000
			(0.000)	(0.000)
Tribal population shares	no	yes***	yes***	yes***
Region controls	no	yes	yes**	yes**
School quality controls	no	no	no	yes*
Observations	3826	3826	3826	3826
Pseudo R-squared	0.005	0.019	0.285	0.288

Robust standard errors in parentheses, corrected for clustering at the village level.
*** p<0.01, ** p<0.05, * p<0.1.
Results on included constant term not reported.

Table 3: School enrolment and tribal fractionalization by gender

School logits	(1) All	(2) Girls	(3) Boys
TF	-0.776**	-0.893**	-0.702**
	(0.339)	(0.413)	(0.357)
Age	2.029***	1.931***	2.162***
	(0.140)	(0.207)	(0.178)
Age^2	-0.070***	-0.066***	-0.075***
	(0.006)	(0.009)	(0.007)
Birth order	-0.038	-0.049	-0.022
	(0.036)	(0.047)	(0.047)
Girl	0.263***		
	(0.086)		
Daily HH expenditure per AE ($)	1.144***	1.254***	1.147*
	(0.427)	(0.481)	(0.646)
Agriculture is main income	0.235	0.020	0.522
	(0.331)	(0.366)	(0.545)
HH exp*Agricultural income	-0.805*	-0.911*	-0.828
	(0.461)	(0.526)	(0.708)
School expenditure, cluster av.	-0.007	-0.003	-0.010
	(0.027)	(0.036)	(0.026)
School distance, cluster av.	-0.238***	-0.256**	-0.213**
	(0.088)	(0.117)	(0.092)
Household has herd	-0.346***	-0.442***	-0.270*
	(0.107)	(0.164)	(0.138)
Total number of children	0.061***	0.064*	0.055**
	(0.022)	(0.035)	(0.026)
Land (ha)	0.009	0.015*	0.004
	(0.007)	(0.009)	(0.008)
Land^2	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Constant	-12.443***	-11.227***	-13.695***
	(0.947)	(1.228)	(1.269)
Tribal population shares	yes***	yes***	yes***
Region controls	yes**	yes	yes***
School quality controls	yes*	yes	yes*
Observations	3826	1895	1931
Pseudo R-squared	0.288	0.286	0.298

Robust standard errors in parentheses, corrected for clustering at village level. *** p<0.01, ** p<0.05, * p<0.1.

Results on included constant term not reported.

Table 4: Remittances and tribal fractionalization

	1	2	3	4
	OLS	Tobit	Probit	OLS
	log(remit)	log(remit)	remit n/y	log(remit)
TF	-1.07**	-10.48**	-0.98**	-1.11
	(0.49)	(5.17)	(0.47)	(0.68)
Formal sector job	1.15***	5.73***	0.54***	0.25*
	(0.17)	(0.89)	(0.09)	(0.14)
Completed primary school	0.48***	7.41***	0.67***	0.19
	(0.13)	(1.32)	(0.12)	(0.14)
Completed secondary school	1.04***	8.38***	0.76***	0.48***
	(0.34)	(1.55)	(0.16)	(0.16)
Girl	0.36**	3.27***	0.31***	-0.18
	(0.14)	(0.94)	(0.09)	(0.15)
Age	0.08***	1.04***	0.09***	0.19***
	(0.02)	(0.23)	(0.02)	(0.06)
Age^2	-0.00***	-0.01***	-0.00***	-0.00***
	(0.00)	(0.00)	(0.00)	(0.00)
(mean) hhsize	-0.02*	-0.07	-0.01	0.02
	(0.01)	(0.10)	(0.01)	(0.02)
Daily HH expenditure per AE ($)	-0.08*	-0.89	-0.09	0.14
	(0.05)	(0.55)	(0.06)	(0.14)
Agriculture is main income	-0.04	0.98	0.11	-0.68**
	(0.13)	(0.86)	(0.09)	(0.27)
Log(Land (ha))	0.20**	1.56***	0.15***	0.11
	(0.08)	(0.57)	(0.06)	(0.10)
Household has herd	-0.01	-0.07	-0.01	-0.01
	(0.01)	(0.05)	(0.00)	(0.01)
Mutual aid among farmers	0.18	1.56*	0.14	0.02
	(0.12)	(0.89)	(0.09)	(0.16)
Community population size	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Inheritance disputes past 12m	0.22*	1.32*	0.13*	-0.01
	(0.11)	(0.76)	(0.07)	(0.18)
Can wife inherit land	0.16	1.24	0.11	0.10
	(0.12)	(0.75)	(0.07)	(0.15)
Funeral arranged by family or clan	-0.24*	-1.70*	-0.16*	-0.04
	(0.14)	(0.97)	(0.09)	(0.13)
Tribe of HH head§	0.000	0.015	0.008	0.087
Village level tribal shares§	0.000	0.000	0.000	0.005
Religion§	0.499	0.394	0.315	0.219
Survey wave§	0.006	0.002	0.001	0.350
sigma^hat		11.10***		
		(0.32)		
Sample	Full	Full	Full	remit > 0
Observations	2875	2875	2852	346
R-squared	0.161	0.116	0.219	0.290
No. of clusters	40	40	40	39
log likelihood		-1843.0	-822.9	

Robust standard errors corrected for clustering at village level in parentheses.
A constant was included but is not reported.
*** p<0.01, ** p<0.05, * p<0.1
§ Reports p-values for F-tests that all variables within category are zero.

Table 5: Alternative explanations

School logits, HRDS sample	(1)	(2)	(3)	(4)
TF	-0.776**	-0.781**	-0.786**	-0.765**
	(0.339)	(0.339)	(0.341)	(0.351)
Limited land availability		-0.186		
		(0.242)		
Land mainly inherited			-0.357	
			(0.600)	
Member of major tribe in cluster				0.015
				(0.157)
Informal credit				
Tribal population shares	yes***	yes***	yes***	yes***
Region controls	yes**	yes**	yes**	yes**
School quality controls	yes*	yes*	yes*	yes*
Observations	3826	3826	3826	3826
Pseudo R-squared	0.288	0.288	0.288	0.288

Robust standard errors in parentheses, corrected for clustering at village level. *** p<0.01, ** p<0.05, * p<0.1.

Regressions included additional control variables as in table 2, model 4: Age, Age^2, Birth-order, Gender, HH expenditure, agriculture income, school expenditure, school distance, herd, no. of children land holdings, interaction terms and a constant.

Table A1. Summary statistics for HRDS sample

Variable	Mean	SD	Min	Max
TF	0.345	0.264	0.000	0.903
Age	11.558	3.142	7.000	17.000
Birth order	2.366	1.954	0.000	16.000
Girl	0.495	0.500	0.000	1.000
Daily HH expenditure per AE ($)	0.724	0.490	0.054	5.213
Daily HH expenditure per AE, squared	0.764	1.630	0.003	27.177
Agriculture is main income	0.893	0.309	0.000	1.000
HH exp*Agricultural income	0.637	0.495	0.000	4.863
School expenditure, cluster av.	6.118	3.413	1.718	19.281
School distance, cluster av.	1.471	0.989	0.185	5.417
Household has herd	0.386	0.487	0.000	1.000
Total number of children	5.068	2.856	0.000	19.000
Land (ha)	15.203	17.916	0.000	190.000
Adequate/good teachers	0.747	0.435	0.000	1.000
Adequate/good headmaster	0.814	0.389	0.000	1.000
Adequate/good school supplies	0.383	0.486	0.000	1.000
Adequate/good environment	0.549	0.498	0.000	1.000
Adequate/good self-reliance	0.774	0.418	0.000	1.000
Adequate/good Swahili	0.865	0.342	0.000	1.000
Adequate/good English	0.573	0.495	0.000	1.000
Adequate/good mathematics	0.768	0.422	0.000	1.000
Adequate/good moral classes	0.724	0.447	0.000	1.000
Limited land availability	0.324	0.355	0.000	1.000
Land mainly inherited	0.205	0.178	0.000	0.733
Informal credit	0.183	0.172	0.000	0.600
Member of major tribe in cluster	0.777	0.416	0.000	1.000
Observations	**3826**			

Data source: HRDS

Table A2. Summary statistics KHDS sample

	mean	sd	min	max
Log(remittances)	0.969	2.655	0.000	12.553
TF	0.172	0.198	0.000	0.660
Formal sector job	0.243	0.429	0.000	1.000
Completed primary school	0.379	0.485	0.000	1.000
Completed secondary school	0.153	0.360	0.000	1.000
Girl	0.330	0.470	0.000	1.000
Age	28.741	9.354	15.000	68.000
HH size	8.398	4.841	1.000	36.000
Mutual aid among farmers	0.722	0.448	0.000	1.000
Daily HH expenditure per AE ($)	0.439	0.682	0.000	9.023
Agriculture is main income	0.793	0.405	0.000	1.000
Log(Land (ha))	0.669	0.772	-2.109	4.123
Household has herd	1.929	6.733	0.000	94.000
Community population size	3195.621	3078.783	525.000	18526.000
Catholic	0.552	0.497	0.000	1.000
Muslim	0.175	0.380	0.000	1.000
Protestant	0.183	0.387	0.000	1.000
Inheritance disputes past 12m	0.558	0.497	0.000	1.000
Can wife inherit land	0.357	0.479	0.000	1.000
Proportion of Mhaya in village	0.665	0.396	0.000	1.000
Proportion of Mnyambo in village	0.090	0.255	0.000	1.000
Proportion of Mhangaza in village	0.095	0.274	0.000	1.000
Proportion of Msubi in village	0.022	0.088	0.000	0.500
Proportion of Mzinza in village	0.007	0.024	0.000	0.150
Proportion of Other tribes in village	0.163	0.292	0.000	1.000
Proportion of Kishubi in village	0.015	0.041	0.000	0.222
Funeral arranged by family or clan	0.703	0.457	0.000	1.000
Observations	**2875**			

Table A.3. The effect of education on formal sector employment.

	1	2	3
Some primary school	0.461*	0.480**	0.394
	(0.243)	(0.243)	(0.257)
Completed primary school	1.185***	1.196***	1.074***
	(0.267)	(0.266)	(0.287)
Completed secondary school	2.288***	2.295***	2.129***
	(0.293)	(0.293)	(0.330)
Age	0.268***	0.266***	0.270***
	(0.055)	(0.054)	(0.056)
Age^2	-0.003***	-0.003***	-0.004***
	(0.001)	(0.001)	(0.001)
Girl	-0.680***	-0.681***	-0.726***
	(0.144)	(0.145)	(0.148)
TF		-0.236	0.012
		(0.463)	(0.600)
Village level tribal shares	No	No	Yes
Survey wave	Yes	Yes	Yes
Place of residence	Yes***	Yes***	Yes***
Observations	2723	2723	2723

Robust standard errors in parentheses. Constant included, but results not reported.

*** p<0.01, ** p<0.05, * p<0.1, Data source: KHDS

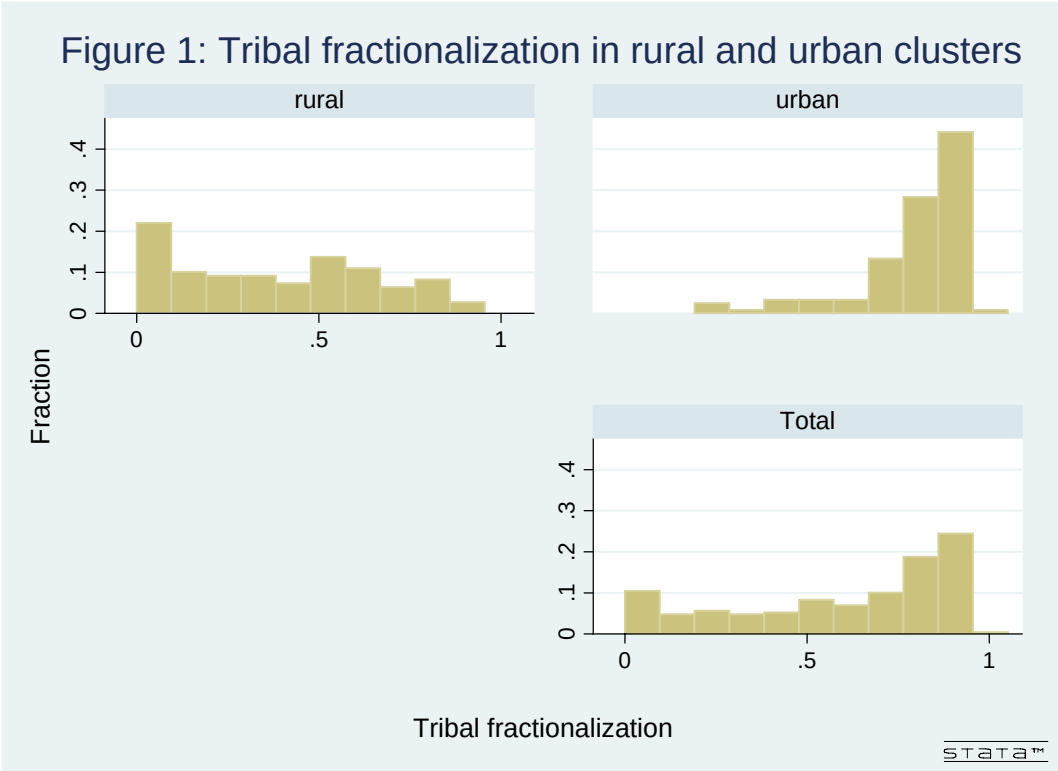
Figure 1: Tribal fractionalization in rural and urban clusters
rural
urban
Total
Fraction
0
.1
.2
.3
.4
0
.5
1
Tribal fractionalization
stata™