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Social Interactions and Aspirations Formation in Rural Ethiopia

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Abstract

The recent literature postulates that aspirations are one of the key determinants of economic decision making, and that aspirations are formed socially through observations and by learning from 'relevant others' (or the 'reference group'). This study empirically examines the latter using survey data collected from sample households in rural Ethiopia. Specifically, the study examines the effect of social interactions on aspirations. Based on several definitions of a 'reference group', we find that aspirations are indeed socially determined through observations as well as social interactions. Results also indicate that the social network size is an important determinant of aspirations, attesting to the importance of widening the aspirations window – a person's cognitive world that shapes their aspirations. Across gender, results indicate that the effect of social interactions on aspirations is larger for females.

Keywords: Social interactions, aspirations, Ethiopia

JEL codes: D03, D62, Z1

Table of Content

1 Introduction

Despite progress, poverty persists across the developing world. A synthesis of several studies across continents finds that poor households frequently underinvest even when returns are high (Banerjee and Duflo, 2011). This puzzle has inspired recent studies to increasingly explore the use of multidisciplinary tools to better understand poverty and other development challenges. The World Bank's flagship publication, "world development report 2015", entitled Mind, Society, and Behavior is a recent evidence of attempts broadly exploring the issue using a multidisciplinary approach. Earlier studies in social psychology such as Bandura (1977) and Bandura et al. (1977) show how might behavioral changes be effected by changing the level and strength of self-efficacy. These and related literature in other social sciences lend conceptual tools for the study of poverty and well-being outcomes.

One of the concepts that has gained recent attention in development economics is the aspirations failure framework, following Appadurai (2004) and Ray (2006), which links the situation of the poor and their investment behavior to low aspirations (or aspirations failure). According to Appadurai (2004), Dalton et al. (2014) and Ray (2006), "internal" constraints such as low aspirations and other psychological factors could reinforce "external" constraints (or material deprivation) and this may lead to a self-sustaining trap of poverty and the lack of proactive behavior. Further, some empirical studies such as Dercon and Singh (2013) find that aspirations could pass on intergenerationally. These imply that finding ways of enhancing the aspirations of the poor could be a powerful tool to break cyclical poverty traps and other development challenges. This paper contributes to the literature by empirically examining the determinants of aspirations with a special focus on the social drivers of aspirations. The remainder of this study is organized as follows. The next Section presents review of the related literature followed by Section 3 which presents the data and descriptive statistics. Section 4 presents the empirical strategy of the study. Results are discussed in Section 5, and Section 6 concludes.

2 Literature review

The existing literature argues that individual 'beliefs, preferences and decisions' are influenced by the social environment which may also be referred to as 'culture' – a set of shared beliefs, symbols and customs (Goodenough, 1999). According to Goodenough (1999), culture consists of cumulated knowledge and experience involving participant observation and interactions. This in turn may affect behavior, for example by expanding the participant's 'capacity to aspire' for the "ideas of the future, as much as of those about the past, are embedded and nurtured" in it (Appadurai, 2004, p.59). In other words, the social environment shapes behavior because people compare their outcomes and achievements not only to their own past level, but also the average achievements of relevant others – in what Ray (2006) referred to as the aspirations window – "an individual's cognitive world, her zone of 'similar', 'attainable' individuals (in terms of their life styles, their social and political norms, and their economic well-being), and from which the individual draws her aspirations" (p.2). Consequently, individuals react by investing in own self-improvement (Genicot & Ray, 2014). This is because people have the tendency to conform with others for the behavior of others conveys information (Easley and Kleinberg, 2010). In this regard, Ray (2006) discusses three pathways in which group action may influence individual behavior, by acting as: internal conveyors of information (e.g. motivation drawn from education experience of neighbors), external conveyors of information (e.g. as lobbying force), and coordination devices (e.g. savings group in which peers' savings behavior may motivate individuals to save) (pp.10-11). Relatedly, Thaler and Sunstain (2009) summarize social influences into three groups: information, peer pressure, and priming – "mysterious workings of the automatic system of the brain…and uses… certain information that immediately comes to mind" (p. 69). Thus, according to Thaler and Sunstain, the power of social influences can help promote policy using nudges. This means that individual behavior can be changed by altering the behavior of others (or some) in the reference group. Social networks are the channels in which interactions occur. Next, we briefly review some empirical literature on the effect of social interactions on aspirations.

Social interactions and aspirations

The existence of various reference groups and/or networks along with the availability of information and differential economic opportunities may trigger feelings of relative deprivation, envy, or increased self-efficacy and aspirations. In this context, in India, Beaman et al. (2012) find that, even in the absence of change in labor market opportunities, exposure to female leaders in local government raised both the aspirations and educational attainment of girls. The role model effect was argued to be the most important channel in changing aspirations, which Macours and Vakis (2009) also find in poor rural areas in

Nicaragua. Using a short term training and cash transfer program aimed at increasing households' investments, Macours and Vakis (2009) find a positive impact of social interactions on aspirations. The authors find stronger results particularly where program beneficiaries lived closer to group leaders who were also recipients. Similarly, using a randomized control that varies the intensity of treatment, i.e. number of people invited to watch inspirational videos of role models, by village, Bernard et al. (2014) show that such simple interventions could help change people's behavior such as aspirations. On the other hand, based on a survey data collected from rural Nepali women, Thompson et al (2015) find evidence that peers' readily observable assets drive one's own wealth aspirations.

Empirical studies examining the social aspects of aspirations formation are quite few. The studies reviewed here, with the exception of Thompson et al (2015), rely on randomized experiments that exogenously vary group composition and/or partial interventions that directly affect only some peers within a group. These allowed the studies to account for the common problems of identification which may arise due to the endogenous formation of networks and/or simultaneity bias (Manski, 1993). The commonality of these studies is that they show the power of social interactions in influencing individual behavior such as aspirations. While this study is similar in some ways to Thompson et al. (2015) who used the same survey instrument developed by Bernard and Taffesse (2014), our approach differs in several ways. First, their survey is based only on female respondents while ours include both male and female members of the same households. This allows us to examine whether the effect of social interactions on aspirations varies by gender. Second, their analysis is based only on two dimensions of aspirations, i.e. income and wealth, while ours further include education and social status, and the aggregate aspirations index constructed from the four dimensions. This allows us to capture broader aspects of aspirations since individuals aspire to achieve various things in life which are directly or indirectly related to the four indicators used in our study. Third, our study benefits from the semi-panel nature of the data (see next section) which helps us to control for own experience in the past as well as present. This allows us to go beyond examining simple correlations, by accounting for other potential determinants of aspirations including land and asset holdings in the past, various shocks experienced in the past, and other psychological factors which all help shape aspirations. Fourth, our study benefits from the qualitative information we collected on self-reported unfulfilled aspirations along with their corresponding reasons. This helps us to justify our use of the four dimensions of aspirations in our study.

3 Data and descriptive statistics

3.1 Sampling and measurement issues

The data comes from a household survey carried out between January and March 2014 in rural Ethiopia. The survey builds upon an existing sample of agricultural households surveyed in 2006 and again in 2010 in Oromia region under an NGO project that promoted agricultural innovations and ended in 2010. The original survey used purposive and random sampling procedures to select 390 households from three study sites (Aredo, et al. 2008). The primary sampling unit consisted of a pair of neighboring districts or woredas which had been chosen based on the density of cultivation of the major crop and the presence of active farmers' cooperatives. At the second stage, kebeles (sub-districts) which had active farmers' cooperatives were selected. Using the number of participating households within a cooperative as a sampling frame, 130 households were randomly selected from each site. In the latest survey, only 379 out of the total of 390 households from the baseline were available for interview. Yet, due to missing data, four households were further excluded from the analysis. This study is based on 375 households. Nevertheless, when compared against the full sample, the households that dropped out of the analysis did not show any statistically significant baseline difference with regards to key indicators such as income, wealth, and landholdings. This implies that sample attrition is not systematic. Further, since the latest survey included individual level data (i.e. for the household head and the spouse, if married, separately), the sample size for individual level analysis is 675. The sample size at individual level is less than twice the number of households. This is because some households are single headed and in others either one of the two spouses were not available for interview.

3.1.1 Defining social networks

Earlier studies on the social drivers of individual behavior, for example in terms of technology adoption, define reference groups based on membership to a village, clan or a group defined by other social and cultural boundaries (e.g. Foster and Rosenzweig, 1995; Munshi, 2004; and Isham, 2002). One of the underlying assumptions is that the outcomes and behavior of all individuals that form the group affects the member's behavior. Yet, this may not be necessarily the case for individuals may look up and draw inspiration only from those who are doing better or from others who are outside the defined network. However, the advantage of, for example, defining the village as a reference group is that it may not only ensure the exogeneity of networks, but also help capture the influence of multiple reference groups that may exist in the village. On the other hand, more recent studies rely on individual level links reported by the respondent either in or out of a sample (e.g.

Maertens and Barrett, 2013 and Conley and Udry, 2010). While these approaches may allow respondents to name people in their cognitive window, whom they closely interact with and compare themselves with, the technique may suffer from truncation bias especially if respondents are allowed to name only a certain number of links while in fact their true networks are much wider (Maertens and Barrett, 2013).

In this study we employ both approaches, taking the village (or kebele) as a reference group, as well as individual links reported by the respondent. For the latter, we employ a 'random matching within sample' technique where each respondent is matched with six randomly drawn individuals from the sample. Then, conditional on knowing the match, we construct networks by eliciting the details of the relationships between the individual and the match. This technique could help minimize the endogeneity of networks, for the random matches listed to the respondent are exogenously determined (by the researcher). Out of the 6 people listed to the respondent, the number of matches known to the respondent ranged from 1 to 6 people, with the average of 4.3 people. Gender wise, female respondents knew 4.1 people and males knew 4.5 people, on average.

3.1.2 Measuring aspirations

Individuals may set different goals in life, which makes aspirations multidimensional. Aspirations are also dynamic that they tend to change in light of new experiences, choices and information (Leavy and Smith, 2010). Further, since aspirations are attitudinal in nature, measurement errors could easily arise due to "anchoring, wording and scale dependence; respondent role playing and instability over time or over respondents' moods" (Bernard and Taffesse, 2014. p.190). Against this backdrop, however, what is suggested in the literature is that useful information regarding individual behavior could be collected as long as extra care is taken during the design and implementation of surveys. For this study, we collect both qualitative and quantitative data. To collet qualitative information, our survey uses two simple and open ended questions which were used in Ibrahim (2011). These questions ask: (1) "What are the three most important things that you wished to achieve in life but couldn't?" (2) "Why couldn't you achieve them?" These questions are intended to capture the "aspired but unfulfilled capabilities" (Ibrahim, 2011). Further, as argued by the author, this approach not only allows the respondents to list which aspirations they had (or have), but also helps to explore why they have failed to achieve these aspirations.

We collect quantitative data on aspirations in four dimensions, using the survey instrument developed and tested for validity and reliability by Bernard and Taffesse (2014). The survey asks individuals a series of five questions regarding their income, wealth, social status and children's education. Specifically, the questions ask:

(1) “What is the level of […] you have at present?”

(2) “What is the level of […] that you would like to achieve?”

(3) “What is the level of […] that you think you will reach within ten years?”

(4) “What is the maximum level of […] that a person can have in your village?”

(5) What is the minimum level of […] that a person can have in your village?”

The questions regarding own current level, village maximum and village minimum are intended to serve as a benchmark against which respondents would state their aspired level. The question on the expected level is intended to guide respondents in differentiating their aspirations from their expectations. To ensure that respondents understood the questions and did not state their simple wishes when asked about their aspirations, special care was applied during interviews, including by probing and checking for consistency across responses. For example, after further clarification of the concept and definitions, respondents were allowed to change their responses if they thought that they had given “incorrect” responses.

In addition, since each dimension of aspirations may mean different things for different people (Leavy and Smith, 2010), the weight or relative importance respondents place on each of the four dimensions was captured as explained next. First, respondents were given 20 beans and a piece of paper that pictured four squares. Each square is labelled with one of the four dimensions of the aspirations measures (i.e. income, wealth, social status or children’s education). Then, respondents were asked to distribute all the 20 beans in the four squares according to their own assessment of the dimension’s significance for them. The instructions were clear. For example, it was explained that no bean in a square means the respondent does not attach any importance to that particular indicator and, many beans in a square means the respondent attaches a significant importance to it. In what follows, we explain how the subjective weights given by the respondents are used in the calculation of an aggregate aspirations index.

As noted before, individuals aspire to achieve different things depending on their experiences and information set. Hence, relying on any single indicator may not suffice to measure aspirations. Yet, these four indicators are believed to be strongly correlated to each other and to many other targets a person might want to achieve in their lives. In this context, an aggregate index constructed from the four dimensions is believed to capture a broad array of life targets and serve as a strong proxy to aspirations. Hence, we calculate an aggregate index following Beaman et al. (2012) and Bernard and Taffesse (2014). The index is constructed by first normalizing each dimension (i.e. by removing the average level for individuals in the same district, and then dividing this difference by the standard deviation for individuals in the same district) and multiplying the result by the weight each individual

gives to each of the four indicators. Summing across the weighted average of the four normalized outcomes provides an aggregate aspirations index.

The calculation of the aggregate aspirations index (A_i) can be represented as:

$$A_i = \sum_{n=1}^{4} \left(\frac{a_n^i - \mu_n^d}{\sigma_n^d} \right) . w_n^i \qquad (1)$$

Where:

a_n^i is the aspired outcome of individual i on dimension n (income, assets, education, or social status).

μ_n^d is the average aspired outcome in district d for outcome n.

σ_n^d is the standard deviation of aspired outcomes in district d for outcome n.

w_n^i is the weight individual i places on dimension n.

3.2 Descriptive statistics

3.2.1 Aspirations

Table 1 presents summary statistics of the qualitative interviews regarding respondents' unfulfilled aspirations and their corresponding reasons. According to Table 1, the top three (about 87% of the responses) unfulfilled aspirations listed by the respondents are associated with wealth and education, and the major one reason (about 61%) for the unfulfilled aspirations is lack of money or income. Other important factors respondents listed as a reason for their unfulfilled aspirations include the absence of institutions nearby (including schools, hospitals), limited access to utilities (such as clean water, electricity,...), lack of access to land and credit facilities, and illness or death of family member. While these qualitative responses may confirm the multidimensionality of the concept of aspirations, the summary statistics also vindicate at least three of the four quantitative indicators which Bernard and Taffesse (2014) proposed and this study employed.

Table 1: Unfulfilled aspirations and the major reasons

	Q.1. What are the three most important things that you wished to achieve in life but couldn't?	**Share**
1	Expand productive asset holdings (including livestock, agricultural tools and machinery, access to more farm land)	30%
2	Improve living standard, own more consumer durables (such as non-productive assets such as modern housing, furniture, television, cell phone….transport vehicle)	39%
3	Improve own level of education or that of children or other family members	17%
4	Start or expand own business, engage in other non-farm income generating activities (such as kiosk, trading, restaurant business…)	5%
5	Use more farm inputs such as fertilizer, chemicals, improved seed; increase yield; use irrigation,	4%
6	Move to towns, migrate to foreign countries for better opportunities	1%
7	Use modern care to maintain own health or that of other household members,	1%
8	Keep savings at the bank	1%
9	Others (throwing a party when a child marries, becoming an athlete, maintain marriage, obtain a civil service position, hire labor)	2%
	Q.2. Why couldn't you achieve them?	
1	Lack of money, high cost of living,	61%
2	Lack of institutions nearby such as schools, hospitals,	14%
3	Lack of education, lack of knowledge, lack of interest	6%
4	Poor governance, lack of support, lack of access to utilities (such as clean water, electricity,...)	7%
5	Illness or death of family member, lack of medical treatment, death of cattle	4%
6	Lack of access to resources such as land, credit facility, fear of incurring loss	4%
7	Lack of time, load of family responsibilities	2%
8	Adverse change in climatic conditions	1%
9	Others (will of God, marriage at early age, lack of labor, lack of market)	2%

Based on the quantitative data, Table 2 presents the level of aspirations by gender of the respondent along with the corresponding mean comparison tests. According to the descriptive statistics, in general, males reveal higher level of aspirations in all four dimensions and the mean differences are statistically significant.

Table 2: Aspirations level the respondent would like to achieve

	Male (N=329)		Female(N=346)		diff = mean(Males') - mean(Females')
	mean	sd	mean	sd	P-value
Income	202,325	277,956	125,833	210,791	0.0001
Assets	495,930	731,861	240,052	458,001	0.0000
Social status	94	15	87	20	0.0000
Children's education	15	3	14	3	0.0048

Note: Income and Wealth are measured in terms of Ethiopian Birr, Children's Education in terms of grades/years of education; and, Social Status in terms of the percentage of people in that village that ask for the individual's advice on some important decisions

Table 3 presents the descriptive statistics on the weights respondents attach to each of the four dimensions of aspirations. In a decreasing order, the average weight respondents give is

30% to Income, 26% to Children's Education, 24% to Assets, and 20% to Social Status. In some cases, Children's Education gets the maximum possible weight and the weight also exhibits the highest dispersion in the data followed by the weight respondents attach to Income. We use these weights to calculate the aggregate aspirations index which along with individual indices is presented in Table 4. Across gender, males reveal statistically significantly higher aspirations than females. Descriptive statistics further suggest that aspirations increase with the increase in age, education, and wealth status. This is also true for the individual aspiration indices for most of these socio-economic groups.

Table 3: Mean of relative importance (or weights) respondents attach to the four dimensions of aspirations (Out of the total score of 20), (N=675)

Variable	Mean	Std. Dev.	Min	Max
Income	6.00	2.10	0	15
Assets	4.71	1.43	0	10
Social Status	4.09	1.59	0	11
Children's Education	5.23	2.18	0	20

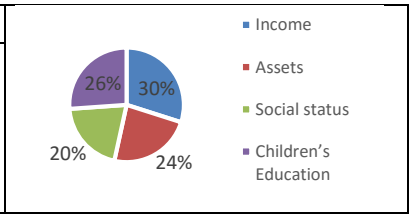

Table 4: Average aspirations[1] index and its components by socio-economic groups

(N=675)	Aggregate aspirations index (mean)	Normalized aspirations (mean), unweighted			
		Income	Asset	Social Status	Children's Education
Whole sample	.021	0.0003	0.0001	-0.0005	0.0033
(Std. dev. in parenthesis)	(0.613)	(0.050)	(0.050)	(0.05)	(0.042)
By Sex					
Female (Std. dev. in parenthesis)	-0.147 (0.571)	-0.007 (0.043)	-0.010 (0.036)	-0.009 (0.056)	-0.003 (0.045)
Male (Std. dev. in parenthesis)	0.198 (0.606)	0.008 (0.056)	0.011 (0.059)	0.009 (0.041)	0.010 (0.039)
diff = mean(Male) - mean(Female), (P value)	*(0.0000)*	*(0.0001)*	*(0.0000)*	*(0.0000)*	*(0.0001)*
Age group					
15-35	-0.16	-0.004	-0.005	-0.009	-0.014
36-55	0.078	0.003	0.002	0.001	0.01
>55	0.081	0.000	0.001	0.006	0.006
Grade of education completed					
0	-0.101	-0.005	-0.008	-0.006	-0.002
1-4	-0.054	-0.004	-0.008	-0.004	0.002
5-8	0.108	0.003	0.005	0.006	0.008
>8	0.307	0.015	0.026	0.008	0.01
Wealth quintile					
Q1	-0.222	-0.010	-0.016	-0.017	-0.005
Q2	-0.067	-0.012	-0.006	0.004	0.004
Q3	0.028	-0.002	0.000	0.004	0.002
Q4	0.062	0.006	0.002	-0.003	0.005
Q5	0.274	0.018	0.019	0.008	0.009

1 Negative sign indicates that the average outcome of a certain group for a specific indicator is below the average outcome of that indicator for the total sample in the same district

As we recall, the *aspirations window* shapes aspirations and this window enlarges with the finding of new information and experience. This may happen, for example, when individuals are exposed to media and information, and experienced some travel and living outside of residence. According to Table 5, on average, males have statistically significantly larger exposure to media and information, and have more travel and living experience outside of residence.[2] This might be one of the reasons on why males demonstrate higher aspirations than females.

Table 5: The aspirations window: average exposure to media and average mobility indices (Mean, N=675)

	Full sample				Mean by gender		t-test: mean(Male)-mean(Female) (P-value)
	Mean	Std. Dev.	Min	Max	Male	Female	
Exposure to media index	11.74	2.78	3	15	12.57	10.94	0.0000
Mobility index	11.65	1.87	5	17	11.98	11.33	0.0000

3.2.2. Other descriptive statistics

Table 6 presents the general overview of sample households on their socio-economic and demographic characteristics. The data suggest that nearly half of the respondents were males. The average age and schooling attainment of respondents was about 47 years and 3.75 years, respectively. The average family size was about 7 people with a 0.37 dependency ratio. The total value of asset holdings, on average, has grown between 2006 and 2014 but the agricultural land holdings has decreased during the same period. Further, during the 12 months prior to the survey, about 9 percent of the households, on average, had experienced negative shocks related to weather, price, or illness of family members or livestock. Households are located at a radius of around 20 minutes' walk to the nearest asphalt road or to the farmers' training center. Other service centers such as the output market, the cooperative office, the nearest input dealer, the district town and the nearest micro finance institution are all located in the range of, on average, 33 to 90 minutes of walk one way trip.

[2] Average exposure to media is calculated by summing over the responses for three questions that ask: "How often do you listen to the radio?", "How often do you watch television?", "How often do you use a mobile/cell phone?" Responses were coded as follows: 5=every day, 4=At least once a week, 3=At least once a month, 2=At least once a year, 1= Never. Similarly, average mobility or travel and living experience outside residence is calculated based on responses for five questions that ask: "How often do you go to nearest town?", "How often do you travel outside the *kebele* within the *woreda*?", "How often do you travel outside the *woreda*?" Responses were coded similar to exposure to media. Yet, the two more questions include: "Have you ever lived for more than 6 months outside this kebele?" and "Have you ever lived for more than 6 months outside this woreda?" Responses were coded as 1=Yes, 0 otherwise.

Table 6: Descriptive statistics on demographics and household endowments

Variable	Obs	Mean	Std. Dev.	Min	Max
Male (dummy)	674	0.49	0.50	0	1
Age (years)	674	46.27	13.15	20	88
Education (level/grade)	674	3.75	3.90	0	16
Household size	375	6.76	2.36	1	16
Dependency ratio	375	0.39	0.21	0	1
Land size in ha (2006)	373	2.87	1.77	0.02	13.06
Value of assets (2006) in ETB	375	11681	11858	21	160809
Land size in ha (2014)	373	2.18	1.43	0	8.25
Value of assets (2014) in ETB at 2006 prices	375	19651	20999	69	209660
Too much rain or flood (dummy)	375	0.09	0.29	0	1
Livestock diseases (dummy)	375	0.08	0.27	0	1
Large increases in input prices (dummy)	375	0.11	0.31	0	1
Death or loss of livestock (dummy)	375	0.09	0.29	0	1
Illness of head/spouse (dummy)	375	0.09	0.29	0	1
Illness of other family member (dummy)	375	0.10	0.29	0	1
Average distance (in minutes) to:					
Market	375	64.42	47.81	1	270
Cooperative office	375	33.44	31.91	1	240
Input dealer	375	72.10	51.44	2	270
Farmer training center	375	22.55	23.01	1	250
Asphalt road	375	18.79	18.46	0	120
Micro finance institution	375	89.95	48.63	5	300

4 Empirical strategy

This section outlines the estimation strategies used to examine the social interactions effect on aspirations. The basic regression model is specified as follows:

$$A_{ij} = \beta\overline{y}_{-ij} + x_{ij}\lambda + \delta_j + \varepsilon_{ij} \qquad (2)$$

Where A_{ij} denotes the aspirations outcome for individual i whose reference group is j; $\overline{y}_{-ij}$ denotes the average outcome of i's reference group j and proxies for the effect of social interactions; x_{ij} denotes a vector of i's observable characteristics including the size of the social network individual i belongs to; δ_j denotes location fixed effects and controls for unobservables common to all at the village and/or district level; and ε_{ij} is a time-variant unobserved component of individual i. We estimate various versions of this model. According to the theory, an individual's aspiration to dimension n is determined by the current average outcome of their reference group in that dimension, given other factors. For example, if A_{ij} represents person i's aspirations to income, then $\overline{y}_{-ij}$ denotes the current average income of the reference group j. The basic equation can be rewritten as follows:

$$A^n_{ij} = \beta\overline{y}^n_{-ij} + x_{ij}\lambda + \delta_j + \varepsilon_{ij} \qquad (3)$$

The basic assumption behind this specification is that the outcomes of all individuals that form the reference group are relevant to drive the aspirations of any given individual in that group, regardless of their relative status compared to the individual. But this may not be necessarily the case for individuals may draw their aspirations rather from those who are richer than themselves, which is referred to as *upward looking aspirations* (Genicot and Ray, 2014). Hence, we re-specify the model considering the average outcome of only those in the reference group who are doing better. The equation takes the following form:

$$A^n_{ij} = \beta\overline{y}^{n(\text{above i})}_{-ij} + x_{ij}\lambda + \delta_j + \varepsilon_{ij} \qquad (4)$$

We estimate both equations 3 and 4 based on different definitions of the "reference group" as well as various measures of aspirations. Reference groups may include individual level social networks, or more broadly all people who live in the same village (see more details in the results section). Yet, recall that, as discussed in the literature review, one's aspirations are determined by own outcome in the past as well as present, the average outcomes of the reference group, access to information and the overall institutional environment. We control for these factors in the regressions. To minimize concerns related to reverse causality that the aspirations of the individual may also affect the aspirations of the reference group, we mainly use lagged values of those explanatory variables which are suspect to drive aspirations, for past outcomes affect present level aspirations but not the other way round. Further, since the respondent and individuals in the reference group may have similar characteristics, the residuals are likely to be correlated. Thus, we cluster the standard errors

at both the household and village level (i.e. two-way clustering) (Cameron et al., 2011 and Petersen, 2009).

Further, when $\overline{y}_{-ij}$ is defined as the aggregate aspirations index of the reference group, it presents more identification challenges for the same variable enters as a regressor and a regressand. The basic equation takes the following form:

$$A_{ij} = \beta\overline{A}_{-ij} + x_{ij}\lambda + \delta_j + \varepsilon_{ij} \qquad (5)$$

This specification may suffer from simultaneity bias or a *reflection problem* (Manski, 1993) for the behavior of the individual also affects the mean behavior of their reference group. According to Manski, (1993), a *reflection problem* arises wherein the propensity of an individual to behave in some way varies with: the mean behavior of the group (*peer effects*); the exogenous characteristics of the group (*contextual effects*); and, *correlated effects* wherein individuals in the same group tend to behave similarly because they have similar individual characteristics or face similar institutional environments. The characteristics of the reference group which are exogenous to the individual could include their income, wealth and other outcomes excluding their aspirations. However, these characteristics of the reference group are essentially the ones from which the individual draws own aspirations. Thus, the effect of these factors could be measured jointly with the behavior of the group (i.e through β). The *correlated effects* could be picked up by the location dummies (i.e. through δ).

As a solution to the *reflection problem*, Manski (2000) suggests several strategies along with their corresponding conditions. We use one of the suggested strategies that satisfy the corresponding condition; instrumental variables estimation technique. Hence, we estimate the reduced form of equation (5), which can be represented as:

$$A_{ij} = \beta\overline{\mathbb{A}}_{-ij} + x_{ij}\lambda + \delta_j + \upsilon_i \qquad (6)$$

Where $\overline{\mathbb{A}}_{-ij}$ denotes the predicted value of $\overline{A}_{-ij}$. We provide relevant discussion regarding the validity of the IVs in the results section.

5 Results and discussion

5.1 The effect of social interactions on aspirations

We examine the social interactions effect on aspirations in two ways. First, we define the *aspirations window* (or the reference group) as social networks which we construct using "random matching within sample" technique. Individuals who belong to a network interact with their counterparts, for instance by sharing information and advice, or supporting each other when needed. These interactions may help shape individual behavior. In this context we examine the social interactions effect on aspirations from a "very close cognitive window" or in what Genicot and Ray (2014) referred to as "local aspirations with population neighborhoods" (p.6). In reality, however, each individual's networks are much broader and the literature also suggests the existence of multiple reference groups. Since it may not be possible to know all the relevant reference groups for each individual, treating residents of a certain geographic location as a reference group may help capture more than one reference group. Hence, in our second approach, we define village as a reference group even though individuals who belong to the same village may not necessarily know each other or may not have close relationships. Yet, lack of acquaintance or individual relationships amongst each villager does not necessarily lead to the exclusion of some from their cognitive windows. This is because, individuals could still compare their status even from the distance by observing tangible wealth indicators such as livestock holdings, housing structure, etc - which all would help shape one's aspirations.

5.1.1 Social networks as a reference group

We begin by looking at the effect of social interactions on aspirations using each dimensions of aspirations (i.e. income, wealth, social status and children's education) separately. Results in Table 7, columns 1 to 8, show that, after controlling for own socio-economic characteristics, the experience of various shocks and the location fixed effects, there does not seem to be a statistically significant relationship between a person's aspirations and the average present outcome of their reference group in any of the four dimensions of aspirations. The basic assumption behind this specification (equation 3) is that the present outcomes of all individuals that form the reference group are relevant to drive one's aspirations, regardless of their relative status compared to the individual. Yet, this may not be necessarily the case for individuals may draw their aspirations rather from those who are richer or who are doing better, which is referred to as "upward looking aspirations" (Genicot and Ray, 2014, p.6). Hence, we re-estimate the model (equation 4) considering the average outcomes of only those in the reference group who are doing better. As Table 8, columns 1, 3, 5 and 7 suggest, indeed there is a positive and statistically significant relationship between

an individual's aspirations (in all dimensions) and the corresponding average outcome of the reference group. Yet, when we control for the self-reported present outcomes (columns 2, 4, 6 and 8), some of the coefficients that proxy for the social interactions effect lose their statistical significance or in some cases become negative. This lack of robustness may come about for many reasons, including measurement error the effect of which could be minimized through standardisation of the individual dimensions of aspirations and hence by using the aggregate aspirations index.

Table 7: The effect of social interactions on each dimension of aspirations (Using the average outcome of all in the reference group)

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Peers' Ave. income(ln)	0.00	-0.02						
	(0.07)	(0.04)						
Peers' Ave. V.assets (ln)			-0.01	-0.05				
			(0.06)	(0.04)				
Peers' Ave. S.status (ln)					0.15	0.10		
					(0.11)	(0.08)		
Peers' Ave. ch.education							0.02	0.00
							(0.05)	(0.04)
Network size	0.09***	0.03*	0.03	0.01	0.02***	0.01**	0.10*	0.12**
	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.06)	(0.06)
Own outcome (perceived)	No	Yes	No	Yes	No	Yes	No	Yes
Other internal factors*	No	Yes	No	Yes	No	Yes	No	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	635	633	635	633	635	633	635	633
R-squared	0.213	0.579	0.263	0.586	0.092	0.393	0.13	0.262

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.
Note: Other internal factors include: Internal locus of control, Self-esteem, Discount factor, and Risk aversion. For full results, see the appendix, Table A1.

Table 8: The effect of social interactions on each dimension of aspirations (Using the average outcome of those who are richer than the respondent)

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Ave. of Peers' above Ave. income(ln)	0.606***	0.082**						
	(0.048)	(0.035)						
Ave. of Peers' above Ave. V.assets (ln)			0.493***	0.000				
			(0.085)	(0.075)				
Ave. of Peers' above Ave. S.status (ln)					0.586***	-0.033		
					(0.154)	(0.112)		
Ave. of Peers' above Ave. ch.education							0.266***	-0.198**
							(0.077)	(0.078)
Network size	0.047	0.008	0.033	0.019	0.018***	0.013*	0.190	0.135
	(0.029)	(0.019)	(0.031)	(0.024)	(0.006)	(0.007)	(0.120)	(0.102)
Own outcome (perceived)	No	Yes	No	Yes	No	Yes	No	Yes
Other internal factors*	No	Yes	No	Yes	No	Yes	No	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	510	508	481	481	476	474	456	455
R-squared	0.309	0.496	0.303	0.518	0.177	0.380	0.166	0.297

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: Other internal factors include Internal locus of control, Self-esteem, Discount factor, and Risk aversion. For full results, see the appendix, Table A2.

Next, we regress the aggregate aspirations index on the average aspirations index (equation 5) of the reference group and other controls mentioned earlier. As before, results in Table 9, columns 1 to 3, suggest there is no evidence of a statistically significant social interactions effect when the group average outcome is calculated by including all individuals in a network regardless of their relative position to the individual. However, when we consider only those who have higher aspirations index than the individual, we find evidence of a positive and statistically significant social interactions effect of aspirations (columns 4 to 6). The results are robust to different specifications and this perhaps suggests that using the aggregate aspirations index may better proxy for one's overall aspirations than using the individual dimensions of aspirations. This may also reflect the secondary effect of social interactions (e.g. conformism) on aspirations besides those derived from the pure observation of peers' outcomes. Nonetheless, these results could still suffer from a reflection problem (Manski, 1993) for the behavior of the individual could also affect the mean behavior of the reference group or network that the individual belongs to. The analysis that may solve for a reflection problem and the discussion of other results including by gender group are deferred to the next section.

Further, notice that the coefficient that indicates network size (or size of the reference group) is positive and statistically significant in most of the specifications (see Table 7, Table

8, and Table 9). This perhaps highlights the importance of having a wider reference group for a stronger social interactions effect. This will be checked in the next section by examining the effect of social interactions on aspirations after defining village as a reference group.

Table 9: The effect of social interactions on aspirations (Based on the aggregate aspirations index)

	(1) Asp. Av.	(2) Asp. Av.	(3) Asp. Av.	(4) Asp. ab. Av.	(5) Asp. ab. Av.	(6) Asp. ab. Av.
Peers' Ave. Asp.index	-0.030	-0.025	-0.047			
	(0.090)	(0.083)	(0.075)			
Av. of Peers' above av.Aspindex				0.436***	0.425***	0.370***
				(0.058)	(0.054)	(0.043)
Network size	0.048***	0.044***	0.027*	0.045***	0.044***	0.039***
	(0.016)	(0.016)	(0.016)	(0.009)	(0.009)	(0.010)
Cognitive indicators	No	Yes	Yes	No	Yes	Yes
Own outcome (perceived), (inc., asset, edu., social status)	No	No	Yes	No	No	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	635	633	633	519	518	518
R-squared	0.196	0.238	0.328	0.418	0.431	0.492

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A3.

5.1.2 Village as a reference group

Following the same procedure as in the preceding section, we regress each dimension of aspirations on the corresponding village level (average) outcome and other controls. As columns 1 to 8 in Table 10 show, we find a positive and statistically significant social interactions effect in all but the aspirations to education. These results seem to confirm what has been implied toward the end of the previous section that having a wider reference group could provide stronger social interactions effect. In order to check for evidence of upward looking aspirations, we re-estimate the model considering the average outcomes of only those who are doing better than the village average (as a reference group). As results in Table 11 (columns 1 to 8) show, the magnitude of the estimated coefficients that indicate the effect of social interactions has increased in all four dimensions of aspirations. In contrast, we find a negative but not statistically significant social interactions effect on aspirations to education. While this evidence of a negative social interactions effect on aspirations to education may well be interpreted in terms of frustration (or envy) when the gap between the aspired and current level of children's education is very large, it may also be associated with other factors such as measurement error. Further, since these individual dimensions of aspirations may mean differently across people, the aggregate aspirations

index may be preferred for better inference since it accounts for the weight each individual attaches to each of the four indicators.

Hence, we re-estimate the model (equation 5) using the aggregate aspirations index on the village level aggregate aspirations index and other controls. Surprisingly, as Table 12 (columns 1 to 3) show, there seems to be no statistically significant social interactions effect of aspirations. Yet, when we consider only those people with aspirations index greater than the village average as a reference group, we find a positive and statistically significant social interactions effect, showing evidence of upward looking aspirations (columns 4 to 6). Nevertheless, as pointed out before, this specification may suffer from a *reflection problem* for the same indicator enters regressions both as a dependent and explanatory variable. Hence, to correct for the potential endogeneity bias that might arise due to this simultaneity, we re-estimate the model (equation 6) using two-stage least squares estimation (2SLS) (or instrumental variables estimation) technique. Yet, finding instruments which are related to the endogenous variable, i.e. the average level of aspirations of other people in the village, but which are exogenous to the outcome (the individual's aspirations level) is not easy. After extensive search in the data, we find three instrumental variables which pass the statistical tests for a valid instrument (i.e. relevance and exogeneity)[3]. Apart from satisfying the requirements of statistical tests, however, instruments should also be theoretically plausible. The three instruments we use are two indicators of subjective well-being measured in the past (i.e. during 2006 survey) and the level of the father's involvement in different local institutions in the past. Next we discuss how these instruments were measured and also their theoretical relevance in some detail.

[3] Several tests were conducted. The Stock and Yogo (2005) test of weak instruments was used for various specifications. The null hypothesis of weak instrument was rejected using either a minimum value of 10 as a rule of thumb for *F* statistic, or the minimum eigenvalue statistic to tolerate distortion for a 5% Wald test based on the 2SLS and LIML estimators. Instruments also satisfy Hansen's test of over identification. See appendix for various tests of instrument validity including relevance and falsification test

Table 10: The effect of social interactions on each dimension of aspirations (Using average outcome of all in the reference group)

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Vill. ave. income(ln)	0.000***	0.000**						
	(0.00)	(0.00)						
Present income(ln)		0.890***						
		(0.04)						
Vill. ave. v.assets(ln)			0.000**	0.000*				
			(0.00)	(0.00)				
Present v.assets(ln)				0.724***				
				(0.05)				
Vill. ave. s.status(ln)					0.010***	0.007***		
					(0.00)	(0.00)		
Present s.status(ln)						0.355***		
						(0.08)		
Vill. ave. ch.education							0.131	0.130
							(0.15)	(0.16)
Present ch.education								0.329***
								(0.07)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.222	0.592	0.285	0.604	0.081	0.390	0.121	0.248
Observations	665	663	665	663	665	663	665	663

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A4.

Table 11: The effect of social interactions on each dimension of aspirations (Using average outcome of those who are richer than the village average)

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Mean outcome above village average								
Income(ln)	0.566***	0.204**						
	(0.09)	(0.08)						
Present income(ln)		0.887***						
		(0.04)						
V.assets(ln)			0.338***	0.145*				
			(0.09)	(0.08)				
Present v.assets(ln)				0.721***				
				(0.05)				
S.status(ln)					0.502**	0.075		
					(0.25)	(0.20)		
Present s.status(ln)						0.356***		
						(0.09)		
Ch.education							-2.991	-5.946
							(4.07)	(4.92)
Present ch.education								0.339***
								(0.08)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	665	663	665	663	665	663	665	663
R-squared	0.231	0.593	0.290	0.604	0.079	0.386	0.122	0.252

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A5.

Table 12: The effect of social interactions on aspirations (Based on the aggregate aspirations index; and, based on average outcome of all in the reference group as well as those with more than village average)

	(1) AvAsp1	(2) AvAsp2	(3) AvAsp3	(4) AbovAv1	(5) AbovAv2	(6) AbovAv3
Vill. ave. Asp. Index	0.32	0.24	0.08			
	(0.29)	(0.33)	(0.30)			
Mean Aspindex Above village av				0.54***	0.46***	0.40***
				(0.10)	(0.14)	(0.13)
Present income(ln)			0.24***			0.23***
			(0.02)			(0.02)
Present v.assets(ln)			0.04			0.04
			(0.03)			(0.03)
Present s.status(ln)			0.20***			0.19***
			(0.04)			(0.04)
Present ch.education			0.02***			0.02***
			(0.01)			(0.01)
Cognitive indicators	No	Yes	Yes	No	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	665	663	663	665	663	663
R-squared	0.193	0.236	0.331	0.208	0.247	0.340

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A6.

The two subjective well-being indicators were measured as follows. Fist, respondents were asked: "How does your household's welfare compare with that of other households in the village?" The choices were "1=better than others", "2=worse than others", "3=not different from others." We recode the values for "Not different from others" from "3" to "0" so that it could serve as a reference for individuals in that position may not be motivated to aspire for lack of a reference group with higher achievements. We recode the values for "worse than others" from "2" to "-1" so that it would have a distinct effect from those who think they are "better than others." The resulting values are -1, 0 and 1. The second subjective well-being indicator asks, "On a ten scale life ladder where 0 represents the worst possible life and 9 represents the best possible life, where on the ladder do you feel you personally stand at present?" Responses were coded from 0 to 9. Now, since an individual may aspire for a better outcome or may fail to do so depending on their own perception about their well-being in comparison to others, subjective well-being contributes to aspirations formation. Hence, it is relevant. But again, since subjective well-being is a perception which is internal to the individual, it is unlikely to be known by other people and hence this cannot directly influence the aspirations of other people. In this case, subjective well-being can be considered exogenous not to mention that it was measured sometime in the past.

The third instrumental variable is the father's role in the past in five different local groups or institutions such as religious group, village committee, parental committee at school, *iddir* (funeral societies), *iqqub* (savings group), and cooperative. The question asks the level of the

father's involvement in terms of being "not a member", "inactive member", "active member" and "official leader" which were given values from 1 to 4, respectively. Summation of the values from the five groups gives an index, a summary measure of a father's involvement in institutions. The level of involvement (e.g. membership or leadership position) in different institutions, particularly in the rural setting of a developing country, determines the level of exposure one may have to various pieces of information, ideas and opportunities which all would help shape one's forward-looking behavior. Since parental behavior very much affects children's behavior, we argue that the identifying variable is relevant but also satisfies the exogeneity assumption. Of course one may think of a scenario where the exogeneity assumption may collapse given that aspirations are socially determined. Nonetheless, we argue that the social effect of parental involvement in institutions on aspirations is theoretically weak due to decay, for the study subjects are adults whose average age is 46 years. Further, the social effect of parental involvement in institutions on aspirations would also require a very strong assumption that people live in the same place since birth. Next we discuss results from the 2SLS estimations.

Results in Table 13 show that there is a positive and statistically significant social interactions effect on aspirations and this finding is robust to different specifications (columns 1 to 6). According to the results a standard deviation increase in the average aspirations index in the village is associated with a (0.59 × 0.078) = 0.046 to (0.98 × 0.078) = 0.076 point increase in the individual's aspirations index.[4] This is a (0.046/0.613) = 0.075 to (0.076/0.613) = 0.124 standard deviations increase in aspirations. Notice that the magnitude of the social interactions coefficient increases when we include more controls such as indicators of shocks experienced in the past that negatively affected the individual, and when we control for indicators of other internal factors such as internal locus of control, trust in others, risk and time preferences (columns 1-4). This perhaps suggests that the effect of social interactions on aspirations is larger for people with strong personality traits. Further, the magnitude of the coefficient estimates is very much relevant for policy as it shows the power of social interactions in raising aspirations. In what follows, we provide a brief discussion regarding other factors that determine aspirations. In the interest of space, we restrict the discussion of results to the full sample and from the IV estimations technique.

[4] The mean and standard deviation of the aspirations index of the individual are (0.021 and 0.613) and that of others' in the village are (0.021 and 0.078).

Table 13: The effect of social interactions on aspirations (Based on the aggregate aspirations index; and, using average outcome of all in the reference group (IV estimates))

	(1)	(2)	(3)	(4)	(5)	(6)
Vill. ave. Asp. Index	0.70*	0.76*	0.79**	0.98***	0.81**	0.59*
	(0.38)	(0.39)	(0.34)	(0.29)	(0.34)	(0.34)
Male	0.23***	0.23***	0.22***	0.18***	0.19***	0.11*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Education level	0.03***	0.04***	0.04***	0.03***	0.03***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HH size	0.28***	0.29***	0.30***	0.29***	0.31***	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
V.of assets_2006 (ln)	0.08***	0.08***	0.08***	0.07***	0.04*	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Dist. coop office (minutes)(ln)		0.03	0.04*	0.04*	0.04**	0.05**
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Illness of other family			-0.13***	-0.10**	-0.10**	-0.09**
			(0.04)	(0.05)	(0.04)	(0.04)
Locus of control				0.18***	0.16***	0.11*
				(0.06)	(0.06)	(0.06)
Trust index				0.03**	0.04***	0.03*
				(0.01)	(0.01)	(0.02)
Real PC expenditure2014(ln)					0.14***	
					(0.03)	
Present income(ln)						0.22***
						(0.02)
Present social status(ln)						0.20***
						(0.04)
Present child education						0.02**
						(0.01)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	649	649	649	647	647	647
r2	0.20	0.21	0.22	0.24	0.26	0.32

Standard errors (clustered at village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A7.

According to Table 13, gender of the respondent is statistically significantly associated with high aspirations implying that being male is associated with aspirations that are about (0.11/0.613) = 0.18 to (0.23/0.613) = 0.38 standard deviations higher than those of women (columns 1 to 6). Perhaps this is because existing customs and traditions could be more supportive of males to explore different opportunities including during childhood such as attending school, making travels to bigger cities, engaging in more interactions outside the household, etc. The cumulative effect of all these would help broaden their *aspirations window* and hence their aspirations. We also find that a standard deviation increase in the level of education would lead to an increase in the aspirations index by (0.02 × 3.96) = 0.078 to (0.04 × 3.96) = 0.158 points (columns 1 to 6). This is about (0.078/0.613) = 0.13 to (0.158/0.613)= 0.26 standard deviations increase in aspirations. The magnitude of the effect is large given that the average aspirations index in the sample is 0.021. The reason could be that having some level of education may help in seeking out for new information and utilizing it, and increasing one's analytical skills and ultimately their aspirations. In fact, since the average level of education in the study households is 3.75 years, this identified effect of

having some more years of education on aspirations is in line with the wider evidence on the importance of primary education for various outcomes in developing countries (e.g. Banerjee and Duflo, 2011), and more specifically in Ethiopia on - farm productivity (e.g. Weir, 1999) and fertilizer adoption (Asfaw and Admassie, 2004).

Household size is also positively and statistically significantly associated with an increased aspirations index. This could be because, having larger family size may avail more labor power, a critical input to do farming which is a labor intensive sector and the main stay of the study households. In addition, having larger family size could also help diversify household livelihood strategies for adult family members could engage in other income generating activities which in turn would have a direct benefit in terms of increased aspirations. In fact, this argument is already supported by the fact that the dependency ratio in the household is negatively associated with aspirations. Further, we also find wealth status in the past to be statistically significantly associated with the aspirations index, which is again in line with expectations. This is because, as discussed in the theoretical literature (e.g. Ray, 2006, Appadurai, 2004; and Dalton et al, 2014), poverty imposes external constraints (e.g. lack of access to information or credit to acquire skills, etc) reducing the productivity of the poor and hence their "navigational capacity to aspire." Further, this could illustrate that poverty may impede cognitive functions, as empirical evidence by Mani et al (2013) show, and this may limit their aspirations. While it is possible that aspirations might lead to higher wealth (reverse causation), it is important to note that wealth measured in the past is considered (Table 13, columns 1 to 4), which cannot be affected by present level aspirations. Yet, when we control for the perceived level of present outcomes such as income, wealth, social status and children's education as a robustness check, the social interactions effect remains positive and statistically significant, confirming the robustness of the findings (Table 13, columns 5 and 6).

As pointed out in the literature, aspirations are formed and developed in response to different environments and circumstances. In this context, out of the six types of shocks respondents experienced[5] and that we control for, we only find that illness of family members is negatively and statistically significantly associated with the aspirations index. Perhaps, while wealth status could serve as a cushion against shocks of this nature in terms of the resource requirements (e.g. Yilma et al, 2014), it may not immune one from the depressing psychological effects that are detrimental to aspirations. Further, from factors that are "internal"[6] to the individual, we find that "trust in others"[7] and "internal locus of

[5] Individuals were asked if they were negatively affected by a serious shock in the last twelve months. These specific shocks include: "Too much rain or flood, Livestock diseases, Large increases in input prices, Death or loss of livestock, Illness and disability of the breadwinner or wife, Illness of other family members." Indicators were asked as binary choice (1 if yes, 0 otherwise)

[6] We control for indicators of *internal locus of control, trust in others, time and risk preferences*. We construct an index for internal locus of control from 14 statements (Levenson, 1981), which reflect the respondent's perception that life outcomes are controlled by: (1) oneself (internality), (2) powerful people, (3) chance.

control (ILC)"[8] indicators are positively associated with the aspirations index at less than 1 percent level of statistical significance. These two results are in line with expectations. For example, *trust in others* may increase a person's openness for interaction which might expose the individual to new information and opportunities, which are again key factors in determining aspirations. Similarly, having *internal locus of control* is perhaps the necessary condition for forward-looking behavior. This is because it is only when one thinks that life outcomes are controlled by themselves that a person would aspire and put some effort to achieving them. In line with this, Ghosal et al (2013) use a randomized control trial and show that aspirations could be enhanced through less costly interventions such as the provision of psychological trainings or what the authors referred to as "dream building."

5.2 The effect of social interactions on aspirations across gender

It is possible that the analysis based on aggregated data may hide some facts, and results in this study seem to suggest just that. We examine the effect of social interactions on aspirations separately for male and female respondents. According to Table 14, the effect of social interactions is statistically significant only for female respondents. Results suggest that a standard deviation increase in the average aspirations index in the village[9] is associated with a (0.87 × 0.078) = 0.068 to a (1.45 × 0.078) = 0.113 points increase in females'

Similarly, we construct an index of "Trust in others" from 2 statements which reflect the respondent's sense of trust in the society. Risk preferences are elicited based two hypothetical decisions: (1) lottery choices with payouts determined by a coin toss, and (2) choices among selling price of a bag of maize with same structure as the lottery payouts x 100. Responses were recoded to reflect less risk aversion. Similarly, time preferences index is constructed from 4 choices. Respondents were asked to choose whether they prefer to receive a certain amount of money today or a higher amount at a later date. Responses were recoded to reflect impatience.

[7] The actual set of statements used to measure *trust* were: (1)"Most people can be trusted" (2) "I would trust my neighbors to look after my field if I had to travel for two months." The responses and corresponding scores are: 4 'strongly agree', 3 'agree', 2 'disagree', or 1 'disagree strongly'. The scores from the two responses were summed and standardized to give "Trust" index.

[8] The actual set of statements used to measure *ILC* were: (1) *Chance*: "To a great extent my life is controlled by accidental/chance happenings", "Often there is no chance of protecting my personal interests from bad luck happenings", "When I get what I want, it's usually/mostly because I'm lucky", "My experience in my life has been that what is going to happen will happen", "It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune"; (2) *Powerful others "*I feel like what happens in my life is mostly determined by powerful people", "My life is chiefly controlled by other powerful people", "People like myself have very little chance of protecting our personal interests when they conflict with those of more powerful people", "Getting what I want requires making those people above me (people with higher status) happy with me", "In order to have my plans work, I make sure that they fit in with the desires of people who have power over me"; and (3) *Internality*: "When I make plans, I am almost certain/guaranteed/sure to make them work", "I can mostly determine what will happen in my life", "I am usually able to protect my personal interests (I can usually look after what is important to me), "When I get what I want, it's usually because I worked hard for it", "My life is determined by my own actions". The choice of responses and corresponding scores were: 4 'strongly agree', 3 'agree', 2 'disagree', or 1 'disagree strongly'. Responses were coded in such a way that high scores always indicate a more internal locus of control. The scores from the 14 responses were summed and standardized to give "internal locus of control" index.

[9] The mean and standard deviation of the aspirations index of females are (-0.148 and 0.571).

aspirations index (columns 1 to 4). This is a (0.068/0.571) = 0.119 to (0.113/0.571) = 0.198 standard deviations increase in aspirations. As we showed in the descriptive statistics, males had statistically significantly larger exposure to media and information, and more travel and living experience outside their residence. This might broaden their aspirations window and hence their reference group could be wider than the village average. Thus, interactions or what happens at the village level may not substantially affect their aspirations. In contrast, females may have limited information set and less exposure outside their residence. Thus, having some form of social interactions at the village may just compensate and broaden their aspirations window and hence their aspirations.

Table 14: The effect of social interactions on aspirations across gender (IV estimates)

	Female				Male			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vill. ave. Asp. Index	1.12***	1.16***	1.45***	0.87***	0.28	0.29	0.23	0.04
	(0.37)	(0.37)	(0.39)	(0.27)	(1.00)	(0.89)	(0.91)	(0.87)
Present income(ln)				0.18***				0.24***
				(0.06)				(0.04)
Present v.assets(ln)				0.02				0.05
				(0.04)				(0.04)
Present s.status(ln)				0.19***				0.18***
				(0.05)				(0.04)
Present ch.education				0.02***				0.01
				(0.01)				(0.01)
Shocks experience	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Cognitive indicators	No	No	Yes	Yes	No	No	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	332	332	332	332	317	317	315	315
r2	0.08	0.09	0.16	0.24	0.22	0.23	0.24	0.33

Standard errors (clustered at village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01
Note: For full results, see the appendix, Table A8.

6 Conclusions

It is argued that social environment and social interactions are central in the formation of aspirations. This study empirically examines the effect of social interactions on aspirations based on two main definitions of reference group. Since individuals identify, interact and compare themselves with others in their immediate cognitive window, we use social networks as a reference group, in the first step. However, the availability of information regarding the outcomes of other people, who may not be "very close", may allow individuals to include them in their reference group (or as a separate reference group). Thus, in the second step, we account for that by defining village as a reference group for village may capture wider or multiple reference groups. Further, in both definitions of a reference group, we examine the social interactions effect based on the average outcomes of all people in the reference group, as well as based on the average outcomes of only those who are doing relatively better. We test the hypothesis using individual components of the four dimensions of aspirations as well as their aggregate index. If true, the evidence from the individual dimensions of aspirations would imply that aspirations are indeed formed by observing peers' outcomes. Similarly, the evidence from the aggregate aspirations index would imply additional source of aspirations for individuals tend to "conform" with others, as the social interactions literature suggests.

In general, results in this study suggest that there is indeed a statistically strong effect of social interactions on aspirations, confirming the theory that aspirations are socially determined. Yet, the magnitude of the coefficient estimates are larger and they are statistically stronger when people in the reference group are only those who are relatively doing better. This, in Genicot and Ray (2014) terminology, is referred to as upward looking aspirations. This is particularly true when the wider reference group (i.e. village) is considered. We find that, for example, a standard deviation increase in the average aspirations index in the village is associated with a 0.046 to 0.076 point increase in individual's aspirations index. This is a 0.075 to 0.124 standard deviations increase in aspirations. Further, we find that social network size is statistically significantly associated with aspirations, providing additional evidence that aspirations increase with the widening of the aspirations window (or the reference group). Results by gender suggest that the effect of social interactions is statistically significant only for females. In the light of the descriptive statistics, males may have aspirations windows wider than the village average and thus neither peers' observed outcomes nor interactions with peers at the village level may substantially affect their aspirations. Females, in contrast, have limited exposure to media and living and travelling experience outside of their village. Thus, observations and having some form of social interactions at the village level may just compensate and broaden their aspirations window and thus their aspirations. Lastly, while results of this study may not be

conclusive due to the absence of credible identifying instruments and the potential for measurement error, the robustness of findings across specifications is believed to offer suggestive evidence. Given these caveats, we conclude that policies aimed at raising the aspirations of the poor or their "capacity to aspire" may benefit from social interactions, and hence any such efforts may use social networks. Further, strategies that empower women and particularly that help widen their aspirations window may earn the highest impact.

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Appendices

Table A1: The effect of social interactions on each dimension of aspirations (Using average outcome of all in the reference group)[#]

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets. Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Peers' Ave. income(ln)	0.00	-0.02						
	(0.07)	(0.04)						
Peers' Ave. V.assets (ln)			-0.01	-0.05				
			(0.06)	(0.04)				
Peers' Ave. S.status (ln)					0.15	0.10		
					(0.11)	(0.08)		
Peers' Ave. ch.education							0.02	0.00
							(0.05)	(0.04)
Network size	0.09***	0.03*	0.03	0.01	0.02***	0.01**	0.10*	0.12**
	(0.02)	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.06)	(0.06)
Male[+]	0.42***	0.16**	0.56***	0.32***	0.05**	0.01	0.48***	0.54**
	(0.08)	(0.08)	(0.08)	(0.07)	(0.03)	(0.02)	(0.18)	(0.23)
Age in years	0.02	0.01	-0.01	-0.01	-0.00	0.00	0.34***	0.06
	(0.01)	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)	(0.11)	(0.08)
Square of age	-0.00	-0.00	0.00	0.00	0.00	-0.00	-0.00***	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.04**	0.00	0.06***	0.01	0.01**	0.00	0.02	-0.00
	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)	(0.04)	(0.04)
Land in ha_2006 (ln)	0.21**	0.01	0.18***	0.06	0.02*	-0.00	0.61*	0.27
	(0.10)	(0.05)	(0.06)	(0.06)	(0.01)	(0.01)	(0.33)	(0.22)
Value of assets_2006 (ln)	0.20***	0.02	0.24***	0.04	0.00	0.00	0.01	-0.20
	(0.04)	(0.03)	(0.05)	(0.03)	(0.01)	(0.01)	(0.13)	(0.13)
Dist. coop office (minutes)(ln)	-0.00	0.01	-0.11	0.00	0.03***	0.01	-0.31	-0.07
	(0.05)	(0.05)	(0.07)	(0.05)	(0.01)	(0.01)	(0.20)	(0.18)
Dist. asphalt road (minutes)(ln)	0.06	0.02	-0.09**	-0.02	-0.01	-0.01	0.09	0.04
	(0.05)	(0.03)	(0.04)	(0.04)	(0.01)	(0.01)	(0.17)	(0.14)
Increased input prices[+]	0.02	-0.14*	0.08	0.09	-0.06**	0.01	0.46	0.02
	(0.15)	(0.08)	(0.14)	(0.15)	(0.03)	(0.04)	(0.43)	(0.30)
Death/ loss of livestock[+]	-0.15	-0.05	-0.43**	-0.08	0.05	0.04	0.50	0.36
	(0.13)	(0.07)	(0.19)	(0.10)	(0.03)	(0.03)	(0.50)	(0.51)
Illness of head/spouse[+]	-0.00	0.10	-0.07	0.19	-0.05	-0.04***	-0.46	-0.35
	(0.09)	(0.08)	(0.16)	(0.12)	(0.03)	(0.01)	(0.72)	(0.69)
Illness of other family[+]	-0.24**	-0.08	-0.30*	-0.09	0.00	-0.06	-0.26	0.45
	(0.10)	(0.08)	(0.17)	(0.09)	(0.03)	(0.04)	(0.36)	(0.48)
Self-esteem		0.02		0.20***		-0.03		0.03
		(0.09)		(0.05)		(0.03)		(0.34)
Subj. welbeing		-0.03		-0.06**		0.01		0.07
		(0.04)		(0.02)		(0.02)		(0.12)
Discount factor		0.02		-0.00		-0.01		0.17***
		(0.02)		(0.02)		(0.01)		(0.06)
Present income(ln) (perceived)		0.89***						
		(0.04)						
Present v.assets(ln) (perceived)				0.72***				
				(0.05)				
Present s.status(ln) (perceived)						0.35***		
						(0.09)		
Present ch.education								0.34***
								(0.08)
Hettosa-Tiyyo[+]	0.28*	-0.26**	-0.04	-0.11	-0.03	-0.02	-0.87***	-1.08***
	(0.15)	(0.10)	(0.13)	(0.09)	(0.03)	(0.02)	(0.33)	(0.26)
Adaa-Lume[+]	0.21**	-0.13	0.09	0.01	-0.07*	-0.05**	-1.75***	-1.83***
	(0.09)	(0.09)	(0.14)	(0.13)	(0.04)	(0.02)	(0.29)	(0.24)
Constant	7.87***	1.59**	10.05***	4.08***	3.77***	2.60***	4.73*	10.71***
	(0.84)	(0.69)	(1.20)	(1.20)	(0.41)	(0.62)	(2.66)	(2.04)
Observations	635	633	635	633	635	633	635	633
R-squared	0.213	0.579	0.263	0.586	0.092	0.393	0.13	0.262

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, FTC, nearest input dealer; dummies for experience of shocks including too much rain/flood, and

livestock diseases; and internal traits such as locus of control, trust in others, and two indicators of risk preferences. [+]Binary

Table A2: The effect of social interactions on each dimension of aspirations (Using average outcome of those who are richer than the respondent)[#]

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Ave. of Peers' above Ave. income(ln)	0.606***	0.082**						
	(0.048)	(0.035)						
Ave. of Peers' above Ave. V.assets (ln)			0.493***	0.000				
			(0.085)	(0.075)				
Ave. of Peers' above Ave. S.status (ln)					0.586***	-0.033		
					(0.154)	(0.112)		
Ave. of Peers' above Ave. ch.education							0.266***	-0.198**
							(0.077)	(0.078)
Network size	0.047	0.008	0.033	0.019	0.018***	0.013*	0.190	0.135
	(0.029)	(0.019)	(0.031)	(0.024)	(0.006)	(0.007)	(0.120)	(0.102)
Male[+]	0.398***	0.208**	0.578***	0.360***	0.028*	0.013	0.564**	0.665**
	(0.107)	(0.081)	(0.098)	(0.102)	(0.015)	(0.020)	(0.284)	(0.282)
Age in years	0.016	0.015	0.008	-0.002	0.001	-0.002	0.272***	0.005
	(0.011)	(0.011)	(0.022)	(0.016)	(0.004)	(0.003)	(0.103)	(0.079)
Square of age	-0.000*	-0.000	-0.000	-0.000	-0.000	0.000	-0.003***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Education level	0.016	0.001	0.028*	0.001	0.003	0.004	0.031	0.004
	(0.013)	(0.010)	(0.017)	(0.016)	(0.003)	(0.003)	(0.058)	(0.049)
Land in ha_2006 (ln)	0.186**	0.046	0.151**	0.076	0.008	-0.001	0.622	0.327
	(0.076)	(0.055)	(0.060)	(0.075)	(0.015)	(0.015)	(0.385)	(0.293)
Value of assets_2006 (ln)	0.107***	0.012	0.142***	0.043*	0.005	-0.005	-0.088	-0.246
	(0.022)	(0.027)	(0.038)	(0.025)	(0.011)	(0.015)	(0.174)	(0.184)
Dist. coop office (minutes)(ln)	0.064*	0.050	-0.062	-0.008	0.028**	0.009	-0.240	-0.062
	(0.039)	(0.047)	(0.070)	(0.056)	(0.013)	(0.021)	(0.292)	(0.265)
Death/ loss of livestock[+]	-0.233**	-0.097	-0.334*	-0.123	0.062	0.060*	0.550	0.690
	(0.098)	(0.073)	(0.189)	(0.126)	(0.045)	(0.032)	(0.703)	(0.725)
Illness of other family[+]	-0.134	-0.015	-0.268*	-0.102	-0.032	-0.047	-0.008	0.582
	(0.126)	(0.106)	(0.153)	(0.113)	(0.045)	(0.044)	(0.340)	(0.475)
Locus of control		0.196**		0.165		0.005		0.791
		(0.086)		(0.105)		(0.028)		(0.480)
Self-esteem		0.045		0.173**		-0.022		0.085
		(0.109)		(0.071)		(0.040)		(0.453)
Discount factor		0.014		0.007		-0.007		0.174**
		(0.021)		(0.022)		(0.007)		(0.084)
Risk_lottery		-0.009		0.053		-0.021*		-0.232*
		(0.019)		(0.034)		(0.011)		(0.127)
Risk_Market		0.026		-0.031		0.026		0.349*
		(0.018)		(0.040)		(0.016)		(0.199)
Present income(ln) (perceived)		0.773***						
		(0.078)						
Present v.assets(ln) (perceived)				0.723***				
				(0.061)				
Present s.status(ln) (perceived)						0.408***		
						(0.122)		
Present ch.education								0.531***
								(0.137)
Hettosa-Tiyyo[+]	-0.085	-0.264***	-0.059	-0.107	-0.026	-0.023	-1.032***	-1.355***
	(0.058)	(0.086)	(0.140)	(0.121)	(0.035)	(0.023)	(0.384)	(0.344)
Adaa-Lume[+]	-0.053	-0.157**	0.046	0.006	-0.094**	-0.053**	-2.036***	-2.187***
	(0.071)	(0.075)	(0.130)	(0.144)	(0.046)	(0.024)	(0.280)	(0.189)
Constant	2.346***	1.630**	4.315***	3.443***	1.795***	3.014***	3.969	13.663***
	(0.543)	(0.806)	(1.511)	(1.269)	(0.583)	(0.294)	(3.148)	(3.177)
Observations	510	508	481	481	476	474	456	455
R-squared	0.309	0.496	0.303	0.518	0.177	0.380	0.166	0.297

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, asphalt road, FTC, nearest input dealer; dummies for experience of shocks including too much rain/flood, increased input prices, illness of household head/spouse, and livestock diseases; and internal traits such as trust in others and subjective well-being. [+]Binary

Table A3: The effect of social interactions on aspirations (Based on the aggregate aspirations index)[#]

	(1) Asp. Av.	(2) Asp. Av.	(3) Asp. Av.	(4) Asp. ab. Av.	(5) Asp. ab. Av.	(6) Asp. ab. Av.
Peers' Ave. Asp.index	-0.030	-0.025	-0.047			
	(0.090)	(0.083)	(0.075)			
Av. of Peers' above av.Aspindex				0.436***	0.425***	0.370***
				(0.058)	(0.054)	(0.043)
Network size	0.048***	0.044***	0.027*	0.045***	0.044***	0.039***
	(0.016)	(0.016)	(0.016)	(0.009)	(0.009)	(0.010)
Male[+]	0.190***	0.151***	0.079	0.087**	0.078**	0.058
	(0.055)	(0.051)	(0.057)	(0.038)	(0.036)	(0.038)
Age in years	0.025*	0.023*	0.009	0.024***	0.025***	0.008
	(0.014)	(0.012)	(0.013)	(0.008)	(0.008)	(0.008)
Square of age	-0.000	-0.000	-0.000	-0.000***	-0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education level	0.036***	0.029***	0.019**	0.015***	0.013***	0.008**
	(0.008)	(0.009)	(0.008)	(0.004)	(0.004)	(0.004)
Land in ha_2006 (ln)	0.099**	0.084*	0.007	0.083***	0.076***	0.031
	(0.045)	(0.043)	(0.041)	(0.021)	(0.021)	(0.019)
Value of assets_2006 (ln)	0.090***	0.068***	0.012	0.026	0.016	-0.010
	(0.029)	(0.025)	(0.030)	(0.018)	(0.017)	(0.019)
Dist. coop office (minutes)(ln)	0.017	0.029	0.037	0.039**	0.044***	0.053***
	(0.027)	(0.028)	(0.030)	(0.016)	(0.016)	(0.019)
Dist. FTC (minutes)(ln)	-0.024	-0.039	-0.059	-0.050***	-0.056***	-0.071***
	(0.037)	(0.037)	(0.039)	(0.016)	(0.016)	(0.017)
Illness of head/spouse[+]	0.027	0.026	0.078	-0.094**	-0.093**	-0.055
	(0.089)	(0.085)	(0.093)	(0.046)	(0.044)	(0.042)
Illness of other family[+]	-0.169**	-0.129*	-0.102*	-0.029	-0.030	-0.002
	(0.066)	(0.078)	(0.061)	(0.055)	(0.063)	(0.062)
ILC index		0.167**	0.106*		0.094**	0.080**
		(0.067)	(0.064)		(0.041)	(0.040)
Trust index		0.039***	0.037***		0.010	0.014
		(0.013)	(0.014)		(0.020)	(0.015)
Subj. welbeing		0.077***	0.015		0.044***	-0.000
		(0.023)	(0.023)		(0.015)	(0.018)
Risk_lottery		-0.011	-0.021		-0.012	-0.015
		(0.017)	(0.016)		(0.008)	(0.010)
Risk_Market		0.016	0.026		0.013*	0.017*
		(0.021)	(0.021)		(0.008)	(0.009)
Present income(ln) (perceived)			0.230***			0.073***
			(0.020)			(0.026)
Present v.assets(ln) (perceived)			0.050*			0.034
			(0.027)			(0.022)
Present s.status(ln) (perceived)			0.181***			0.142***
			(0.037)			(0.054)
Present ch.education			0.018**			0.024***
			(0.007)			(0.007)
Hettosa-Tiyyo[+]	-0.165**	-0.190***	-0.322***	-0.060	-0.070	-0.120**
	(0.078)	(0.073)	(0.062)	(0.067)	(0.065)	(0.053)
Adaa-Lume[+]	-0.103*	-0.133***	-0.198***	-0.018	-0.028	-0.049
	(0.054)	(0.051)	(0.056)	(0.061)	(0.061)	(0.043)
Constant	-2.050***	-1.819***	-4.528***	-1.470***	-1.415***	-2.544***
	(0.310)	(0.317)	(0.567)	(0.252)	(0.275)	(0.343)
Observations	635	633	633	519	518	518
R-squared	0.196	0.238	0.328	0.418	0.431	0.492

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, asphalt road, nearest input dealer; dummies for experience of shocks including too much rain/flood, increased input prices, livestock diseases, and death/ loss of livestock; and internal traits such as self-esteem and discount factor (or time preference). +Binary

Table A4: The effect of social interactions on each dimension of aspirations: Reference group – village, all (Using average outcome of all in the reference group)[#]

	(1) Inc. Asp.1	(2) Inc. Asp.2	(3) Assets Asp.1	(4) Assets Asp.2	(5) Status Asp.1	(6) Status Asp.2	(7) Educ. Asp.1	(8) Educ. Asp.2
Vill. ave. income(ln)	0.000***	0.000**						
	(0.00)	(0.00)						
Vill. ave. v.assets(ln)			0.000**	0.000*				
			(0.00)	(0.00)				
Vill. ave. s.status(ln)					0.010***	0.007***		
					(0.00)	(0.00)		
Vill. ave. ch.education							0.131	0.130
							(0.15)	(0.16)
Male[+]	0.482***	0.179**	0.598***	0.345***	0.063**	0.014	0.496***	0.510**
	(0.10)	(0.08)	(0.08)	(0.08)	(0.03)	(0.02)	(0.18)	(0.21)
Age in years	0.022	0.015	-0.000	-0.007	0.002	0.000	0.303***	0.045
	(0.02)	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)	(0.10)	(0.07)
Square of age	-0.000	-0.000	-0.000	0.000	0.000	-0.000	-0.003***	-0.001
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.040***	0.005	0.065***	0.014	0.007**	0.001	0.027	-0.006
	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)	(0.04)	(0.04)
Land in ha_2006 (ln)	0.225**	0.022	0.205***	0.071	-0.006	-0.020	0.574**	0.221
	(0.10)	(0.05)	(0.05)	(0.05)	(0.01)	(0.01)	(0.29)	(0.21)
Value of assets_2006 (ln)	0.201***	0.016	0.248***	0.045**	0.020	0.013	0.046	-0.157
	(0.04)	(0.03)	(0.06)	(0.02)	(0.02)	(0.01)	(0.13)	(0.14)
Dist. coop office (minutes)(ln)	-0.033	0.003	-0.113*	0.008	0.027***	0.013	-0.259	-0.030
	(0.05)	(0.05)	(0.07)	(0.05)	(0.01)	(0.01)	(0.19)	(0.18)
Dist. asphalt road (minutes)(ln)	0.046	0.025	-0.098**	-0.012	-0.006	-0.004	0.134	0.100
	(0.04)	(0.03)	(0.05)	(0.04)	(0.01)	(0.01)	(0.18)	(0.16)
Increased input prices[+]	0.038	-0.130*	0.040	0.074	-0.060**	0.001	0.553	0.094
	(0.14)	(0.07)	(0.16)	(0.15)	(0.03)	(0.03)	(0.46)	(0.33)
Death/ loss of livestock[+]	-0.166	-0.054	-0.431***	-0.102	0.050	0.033	0.553	0.397
	(0.12)	(0.07)	(0.17)	(0.09)	(0.03)	(0.03)	(0.49)	(0.49)
Illness of head/spouse[+]	-0.023	0.089	-0.041	0.201*	-0.058**	-0.055***	-0.469	-0.336
	(0.09)	(0.09)	(0.16)	(0.12)	(0.03)	(0.02)	(0.71)	(0.69)
Illness of other family[+]	-0.234***	-0.076	-0.260*	-0.069	-0.002	-0.053	-0.239	0.435
	(0.08)	(0.07)	(0.15)	(0.08)	(0.03)	(0.04)	(0.35)	(0.45)
Locus of control		0.122*		0.099		0.014		0.707*
		(0.06)		(0.09)		(0.03)		(0.39)
Self-esteem		0.017		0.213***		-0.016		-0.024
		(0.09)		(0.05)		(0.03)		(0.34)
Subj. welbeing		-0.041		-0.065***		0.009		0.061
		(0.04)		(0.02)		(0.01)		(0.13)
Risk_lottery		0.008		0.028		-0.016*		-0.167
		(0.02)		(0.02)		(0.01)		(0.12)
Risk_Market		-0.005		-0.018		0.019		0.254*
		(0.01)		(0.03)		(0.01)		(0.15)
Present income(ln) (perceived)		0.890***						
		(0.04)						
Present v.assets(ln) (perceived)				0.724***				
				(0.05)				
Present s.status(ln) (perceived)						0.355***		
						(0.08)		
Present ch.education								0.329***
								(0.07)
Hettosa-Tiyyo[+]	-0.020	-0.383***	-0.055	-0.141*	-0.043*	-0.031	-1.015**	-1.297***
	(0.10)	(0.09)	(0.12)	(0.08)	(0.02)	(0.02)	(0.44)	(0.36)
Adaa-Lume[+]	0.056	-0.191**	0.078	-0.007	-0.064**	-0.056***	-1.868***	-2.061***
	(0.10)	(0.09)	(0.11)	(0.10)	(0.03)	(0.02)	(0.33)	(0.32)
Constant	7.879***	1.285*	9.403***	3.179***	3.694***	2.542***	4.980*	10.399***
	(0.51)	(0.66)	(0.88)	(0.84)	(0.21)	(0.36)	(2.73)	(2.32)
Observations	665	663	665	663	665	663	665	663
R-squared	0.222	0.592	0.285	0.604	0.081	0.390	0.121	0.248

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance o- market, nearest input dealer, FTC; dummies for experience of shocks including too much rain/flood, livestock diseases; and internal traits such as trust in others, and discount factor. +Binary

Table A5: The effect of social interactions on each dimension of aspirations (Using average outcome of those who are richer than the village average)[#]

	(1) Inc1	(2) Inc2	(3) Assets1	(4) Assets2	(5) Status1	(6) Status2	(7) Educ1	(8) Educ2
Mean outcome above village average								
Income(ln)	0.566***	0.204**						
	(0.09)	(0.08)						
Value of assets(ln)			0.338***	0.145*				
			(0.09)	(0.08)				
Social status(ln)					0.502**	0.075		
					(0.25)	(0.20)		
Children's .education							-2.991	-5.946
							(4.07)	(4.92)
Male[+]	0.481***	0.182**	0.604***	0.348***	0.059**	0.013	0.499***	0.541**
	(0.10)	(0.08)	(0.08)	(0.08)	(0.03)	(0.02)	(0.18)	(0.21)
Age in years	0.021	0.015	-0.001	-0.007	0.001	0.000	0.300***	0.034
	(0.02)	(0.01)	(0.02)	(0.02)	(0.00)	(0.00)	(0.10)	(0.06)
Square of age	-0.000	-0.000	-0.000	0.000	0.000	-0.000	-0.003***	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.040***	0.005	0.064***	0.014	0.007***	0.002	0.025	-0.007
	(0.01)	(0.01)	(0.02)	(0.01)	(0.00)	(0.00)	(0.04)	(0.04)
Land in ha_2006 (ln)	0.232**	0.025	0.209***	0.072	0.001	-0.015	0.581**	0.229
	(0.10)	(0.05)	(0.06)	(0.05)	(0.01)	(0.01)	(0.29)	(0.20)
Value of assets_2006 (ln)	0.201***	0.017	0.245***	0.044**	0.017	0.011	0.050	-0.151
	(0.04)	(0.03)	(0.06)	(0.02)	(0.02)	(0.01)	(0.13)	(0.12)
Dist. coop office (minutes)(ln)	-0.026	0.005	-0.107	0.009	0.025***	0.011	-0.253	-0.016
	(0.05)	(0.05)	(0.07)	(0.05)	(0.01)	(0.01)	(0.19)	(0.18)
Dist. asphalt road (minutes)(ln)	0.037	0.022	-0.096**	-0.012	-0.004	-0.004	0.091	0.023
	(0.04)	(0.03)	(0.05)	(0.04)	(0.01)	(0.01)	(0.15)	(0.12)
Increased input prices[+]	0.043	-0.126*	0.038	0.074	-0.061**	0.001	0.573	0.138
	(0.14)	(0.07)	(0.16)	(0.15)	(0.03)	(0.03)	(0.47)	(0.33)
Death/ loss of livestock[+]	-0.189	-0.063	-0.455***	-0.110	0.052*	0.028	0.536	0.368
	(0.12)	(0.07)	(0.16)	(0.10)	(0.03)	(0.03)	(0.50)	(0.51)
Illness of head/spouse[+]	-0.025	0.088	-0.020	0.207*	-0.056*	-0.051***	-0.514	-0.409
	(0.08)	(0.09)	(0.17)	(0.12)	(0.03)	(0.02)	(0.71)	(0.67)
Illness of other family[+]	-0.197***	-0.065	-0.238*	-0.064	-0.003	-0.048	-0.168	0.542
	(0.07)	(0.07)	(0.14)	(0.08)	(0.03)	(0.03)	(0.35)	(0.46)
Self-esteem		0.010		0.213***		-0.016		-0.084
		(0.08)		(0.05)		(0.03)		(0.33)
Subj. welbeing		-0.041		-0.064***		0.010		0.044
		(0.04)		(0.02)		(0.01)		(0.13)
Risk_lottery		0.006		0.027		-0.016*		-0.175
		(0.02)		(0.02)		(0.01)		(0.11)
Risk_Market		-0.005		-0.017		0.020		0.259*
		(0.01)		(0.03)		(0.01)		(0.15)
Present income(ln) (perceived)		0.887***						
		(0.04)						
Present v.assets(ln) (perceived)				0.721***				
				(0.05)				
Present s.status(ln) (perceived)						0.356***		
						(0.09)		
Present ch.education								0.339***
								(0.08)
Hettosa-Tiyyo[+]	-0.006	-0.377***	-0.056	-0.139*	-0.039	-0.026	-0.602	-0.682
	(0.11)	(0.10)	(0.10)	(0.08)	(0.03)	(0.02)	(0.57)	(0.50)
Adaa-Lume[+]	0.042	-0.196**	0.052	-0.019	-0.083*	-0.074***	-1.592***	-1.647***
	(0.10)	(0.09)	(0.09)	(0.09)	(0.05)	(0.03)	(0.30)	(0.20)
Constant	1.958	-0.835	5.507***	1.592	2.074*	2.613***	12.902	25.298**
	(1.29)	(0.87)	(1.62)	(1.05)	(1.11)	(0.64)	(9.72)	(12.16)
Observations	665	663	665	663	665	663	665	663
R-squared	0.231	0.593	0.290	0.604	0.079	0.386	0.122	0.252

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, FTC, nearest input dealer; dummies for experience of shocks including too much rain/flood, livestock diseases; and internal traits such as trust in others, locus of control, discount factor. [+]Binary

Table A6: The effect of social interactions on aspirations: Reference group – village, all and richer (Based on average outcome of all in the reference group (columns 1-3) as well as those with more than village average (columns 4-6))[#]

	(1) Av.Asp1	(2) Av.Asp2	(3) Av. Asp3	(4) Abov.Av1	(5) Abov.Av2	(6) Abov.Av3
Vill. ave. Asp. Index	0.32	0.24	0.08			
	(0.29)	(0.33)	(0.30)			
Mean of Aspindex Above village av				0.54***	0.46***	0.40***
				(0.10)	(0.14)	(0.13)
Male[+]	0.22***	0.18***	0.09	0.22***	0.18***	0.10
	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)	(0.06)
Age in years	0.02**	0.02**	0.01	0.02**	0.02***	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Square of age	-0.00*	-0.00*	-0.00	-0.00*	-0.00**	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.04***	0.03***	0.02**	0.04***	0.03***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Land in ha_2006 (ln)	0.10**	0.08*	0.00	0.09**	0.08*	0.00
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Value of assets_2006 (ln)	0.09***	0.07***	0.01	0.10***	0.07***	0.02
	(0.03)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Illness of other family[+]	-0.15**	-0.12	-0.09	-0.14**	-0.11	-0.08
	(0.06)	(0.08)	(0.06)	(0.07)	(0.08)	(0.06)
Locus of control		0.18***	0.12*		0.19***	0.12*
		(0.07)	(0.07)		(0.07)	(0.07)
Trust		0.03***	0.03**		0.03**	0.03**
		(0.01)	(0.01)		(0.01)	(0.01)
Subj. welbeing		0.07***	0.01		0.07***	0.01
		(0.02)	(0.02)		(0.02)	(0.02)
Risk_lottery		-0.01	-0.02		-0.01	-0.02
		(0.02)	(0.02)		(0.02)	(0.02)
Risk_Market		0.01	0.02		0.01	0.02
		(0.02)	(0.02)		(0.02)	(0.02)
Present income(ln) (perceived)			0.24***			0.23***
			(0.02)			(0.02)
Present v.assets(ln) (perceived)			0.04			0.04
			(0.03)			(0.03)
Present s.status(ln) (perceived)			0.20***			0.19***
			(0.04)			(0.04)
Present ch.education			0.02***			0.02***
			(0.01)			(0.01)
Hettosa-Tiyyo[+]	-0.14**	-0.17***	-0.31***	-0.13***	-0.16***	-0.30***
	(0.07)	(0.06)	(0.06)	(0.04)	(0.04)	(0.02)
Adaa-Lume[+]	-0.10**	-0.13***	-0.20***	-0.12***	-0.15***	-0.21***
	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)
Constant	-1.90***	-1.67***	-4.48***	-2.12***	-1.87***	-4.54***
	(0.27)	(0.27)	(0.52)	(0.25)	(0.26)	(0.53)
Observations	665	663	663	665	663	663
R-squared	0.193	0.236	0.331	0.208	0.247	0.340

Standard errors (clustered at household and village level) in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, asphalt road, nearest input dealer, coop office, FTC; ; dummies for experience of shocks including too much rain/flood, livestock diseases; death/loss of livestock, increased input prices, illness of household head/spouse; and internal traits such as self-esteem, and discount factor. [+]Binary

Table A7: The effect of social interactions on aspirations (IV estimates): Reference group – village (Based on the aggregate aspirations index, and using average outcome of all in the reference group)[#]

	(1)	(2)	(3)	(4)	(5)	(6)
Vill. ave. Asp. Index	0.70*	0.76*	0.79**	0.98***	0.81**	0.59*
	(0.38)	(0.39)	(0.34)	(0.29)	(0.34)	(0.34)
Male	0.23***	0.23***	0.22***	0.18***	0.19***	0.11*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
Age in years	0.01	0.01	0.01	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Square of age	0.00	0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.03***	0.04***	0.04***	0.03***	0.03***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HH size	0.28***	0.29***	0.30***	0.29***	0.31***	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Dependency ratio	-0.09	-0.09	-0.07	-0.07	-0.02	0.08
	(0.12)	(0.11)	(0.12)	(0.11)	(0.11)	(0.10)
Land in ha_2006 (ln)	0.05	0.05	0.05	0.05	0.02	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Value of assets_2006 (ln)	0.08***	0.08***	0.08***	0.07***	0.04*	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Dist. coop office (minutes)(ln)		0.03	0.04*	0.04*	0.04**	0.05**
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Dist. FTC (minutes)(ln)		-0.04	-0.05	-0.05	-0.06	-0.07*
		(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Illness of other family			-0.13***	-0.10**	-0.10**	-0.09**
			(0.04)	(0.05)	(0.04)	(0.04)
Locus of control				0.18***	0.16***	0.11*
				(0.06)	(0.06)	(0.06)
Trust index				0.03**	0.04***	0.03*
				(0.01)	(0.01)	(0.02)
Risk_composite				-0.00	-0.01	-0.00
				(0.01)	(0.01)	(0.01)
Real PC expenditure2014(ln)					0.14***	
					(0.03)	
Value of assets_14(ln)					0.04	
					(0.02)	
Present level of income(ln) (perceived)						0.22***
						(0.02)
Present level of the value of assets(ln) (perceived)						0.04
						(0.02)
Present level social status(ln) (perceived)						0.20***
						(0.04)
Present level of education of the oldest child						0.02**
						(0.01)
Hettosa-Tiyyo	-0.07*	-0.10***	-0.13***	-0.15***	-0.22***	-0.29***
	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)
Adaa-Lume	0.01	-0.03	-0.07*	-0.10**	-0.16***	-0.17***
	(0.03)	(0.04)	(0.03)	(0.04)	(0.05)	(0.04)
Constant	-1.71***	-1.84***	-1.88***	-1.77***	-2.52***	-4.33***
	(0.28)	(0.32)	(0.34)	(0.33)	(0.28)	(0.54)
Observations	649	649	649	647	647	647
r2	0.20	0.21	0.22	0.24	0.26	0.32

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

#*Note*: the following indicators were controlled but the coefficients were not statistically significant: distance to- market, asphalt road, nearest input dealer, FTC; dummies for experience of shocks including too much rain/flood, livestock diseases; death/loss of livestock, increased input prices, illness of household head/spouse; and discount factor. +Binary

Table A8: The effect of social interactions on aspirations across gender (IV estimates): Reference group – village (Based on the aggregate aspirations index, using average outcome of all in the reference group)[#]

	Female				Male			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Vill. ave. Asp. Index	1.12***	1.16***	1.45***	0.87***	0.28	0.29	0.23	0.04
	(0.37)	(0.37)	(0.39)	(0.27)	(1.00)	(0.89)	(0.91)	(0.87)
Age in years	0.02**	0.02**	0.03**	0.01	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Square of age	-0.00*	-0.00**	-0.00*	-0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education level	0.03***	0.04***	0.02**	0.01	0.04***	0.04***	0.04***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HH size	0.20***	0.21***	0.16**	-0.04	0.41***	0.41***	0.44***	0.23***
	(0.06)	(0.07)	(0.08)	(0.07)	(0.08)	(0.07)	(0.06)	(0.06)
Dependency ratio	-0.07	-0.03	-0.03	0.12	-0.15*	-0.16	-0.19*	-0.07
	(0.17)	(0.17)	(0.14)	(0.15)	(0.09)	(0.11)	(0.10)	(0.09)
Land in ha_2006 (ln)	0.03	0.02	0.03	-0.01	0.06	0.07	0.06	0.03
	(0.04)	(0.04)	(0.05)	(0.05)	(0.06)	(0.07)	(0.07)	(0.06)
Value of assets_2006 (ln)	0.04*	0.04**	0.04**	0.01	0.11***	0.11***	0.11***	0.04
	(0.07)	(0.07)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
Dist. coop office (minutes)(ln)	0.03	0.03	0.03	0.04**	0.03	0.03	0.04	0.05
	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)	(0.03)	(0.04)
Dist. FTC (minutes)(ln)	-0.10*	-0.10**	-0.10**	-0.11**	0.02	0.02	0.02	-0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)
Livestock diseases[+]		0.02	0.01	-0.05		-0.16	-0.12	-0.18*
		(0.08)	(0.09)	(0.08)		(0.11)	(0.12)	(0.11)
Illness of other family[+]		-0.17**	-0.15***	-0.12**		-0.07	-0.05	-0.06
		(0.07)	(0.05)	(0.05)		(0.09)	(0.07)	(0.06)
Locus of control			0.26***	0.19**			0.02	-0.06
			(0.07)	(0.07)			(0.11)	(0.12)
Trust index			0.00	0.01			0.08**	0.07**
			(0.03)	(0.02)			(0.03)	(0.03)
Discount factor			0.05***	0.05***			-0.01	-0.01
			(0.02)	(0.02)			(0.02)	(0.02)
Risk_composite			-0.00	-0.00			0.00	0.00
			(0.01)	(0.01)			(0.01)	(0.01)
Present income(ln) (perceived)				0.18***				0.24***
				(0.06)				(0.04)
Present v.assets(ln) (perceived)				0.02				0.05
				(0.04)				(0.04)
Present s.status(ln) (perceived)				0.19***				0.18***
				(0.05)				(0.04)
Present ch.education				0.02***				0.01
				(0.01)				(0.01)
Hettosa-Tiyyo[+]	-0.02	-0.05	-0.09	-0.2***	-0.18	-0.21**	-0.22**	-0.36***
	(0.04)	(0.05)	(0.08)	(0.04)	(0.11)	(0.10)	(0.09)	(0.07)
Adaa-Lume[+]	-0.03	-0.06	-0.13*	-0.2***	-0.04	-0.07	-0.06	-0.17***
	(0.04)	(0.05)	(0.08)	(0.05)	(0.10)	(0.07)	(0.06)	(0.05)
Constant	-1.5***	-1.58***	-1.42***	-3.4***	-1.9***	-1.8***	-1.7***	-4.71***
	(0.38)	(0.37)	(0.33)	(0.53)	(0.59)	(0.60)	(0.61)	(1.01)
Observations	332	332	332	332	317	317	315	315
r2	0.08	0.09	0.16	0.24	0.22	0.23	0.24	0.33

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

[#]*Note:* the following indicators were controlled but the coefficients were not statistically significant: distance to- market, asphalt road, nearest input dealer; dummies for experience of shocks including too much rain/flood, death/loss of livestock, increased input prices, illness of household head/spouse. [+]Binary