

**Ethiopian Youth in Agriculture: Relative Deprivation,
Well-being and Occupational Choices**

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Abstract

Africa has the highest share of young people in the world relative to the total population, with the median age of the population under 25 years old, which is not expected to change in the coming decades. This high proportion of young people, combined with other factors, has prompted a sharp rise in youth unemployment in many Sub-Saharan African countries, including Ethiopia, with implications for Africa's social and economic future. This thesis examines the current dynamics of youth employment, occupational choices, and factors driving these dynamics within the agricultural sector in Ethiopia across space, time, and gender.

Using gender and age-specific values of agricultural labor return from farm-level panel data collected from a sample of youth and households in rural Ethiopia, the second chapter econometrically investigates the effect of marginal products of labor (or shadow wages) on youth agricultural labor supply across gender, time and farm locations. Evidence from fixed effects and fixed effects instrumental variables (FE-IV) models show that changes in economic incentives (or shadow wages) matter for youth's involvement in agriculture, but their impact differs for young men and women. Results suggest that it is necessary to enhance labor productivity and employment opportunities, as well as structural transformation addressing the imperfections and rigidities in labor and other input markets, to make agriculture more attractive to youth.

Recent empirical work provides evidence that people take actions out of a concern for relative standing, suggesting that more can be explained if we move beyond the standard choice theory and recognize relative concerns. Incorporating relative deprivation (RD) in youth occupational choices helps to provide a complementary explanation, if not an alternative explanation, to better understand occupational choices of rural youth and the causes of rural under-development in Ethiopia. Relative concerns (or positional income concerns) are one mechanism through which income or wealth inequality is hypothesized to affect human behavior such as occupational choices, with consequences on well-being. Employing survey experimental methods and a socio-demographic survey, the third chapter finds that positional concerns for income vary across household members (youth, mothers and fathers) impacting on the youth's well-being. Chapter four extends the analysis of relative concerns from income *per se* to consider social as well as assets (non-monetary) RD, using objective and subjective measures. The evidence suggests that while income RD has a motivational impact (resulting from a "positive externality"), assets and social capital RD have deterrent impacts (resulting from a "status effect") on the well-being of youth, though this varies across young men and women.

The thesis aids understanding of the implications of different forms of relative deprivations by examining their interactions with both the underlying drivers of occupational choices of young people and the occupational choices themselves. Using different estimation techniques, chapter five finds that RD is a strong predictor of occupational choices of the rural youth and their engagement in agriculture (irrespective of the RD and occupational choice indicators employed), together with an influence of the preferences and attributes of the parents.

This thesis argues that confining RD to the monetary sphere may be misleading and doing so does not capture the real effects of RD on the well-being or occupational choices. In addition, the use of multiple reference groups and measures suggest possible areas of intervention to enhance the positive externalities arising from economic gains to peers, not captured using conventional approaches. The thesis indicates that controlling for both father and mother attributes simultaneously crucially interacts with the impacts of RD and that indicators of realized and intended occupational choices vary greatly. Studies using such data for the labor market, poverty and/or migration policy analysis should be mindful of such variations.

Zusammenfassung

Afrika hat weltweit den höchsten Anteil junger Leute an der Gesamtbevölkerung; der Altersmedian der Gesamtbevölkerung liegt bei unter 25 Jahren. An diesem Trend dürfte sich laut aktuellen Prognosen auch in den nächsten Jahrzehnten nichts ändern. Dieser hohe Anteil an jungen Leuten hat, zusammen mit anderen Faktoren, zu einem starken Anstieg der Jugendarbeitslosigkeit in zahlreichen Ländern südlich der Sahara, so auch in Äthiopien, geführt – mit Folgen für Afrikas soziale und ökonomische Zukunft. Diese Arbeit untersucht die aktuelle Dynamik in der Beschäftigungssituation der Jugend, ihre Berufswahl sowie die Treiber und Bedeutung dieser Entwicklung für die Landwirtschaft in Äthiopien, und zwar im Hinblick auf Raum, Zeit und Geschlecht.

Das zweite Kapitel untersucht ökonometrisch die Auswirkungen von *Grenzprodukten der Arbeit* (Schattenlöhnen) auf das Arbeitsangebot junger Menschen in der Landwirtschaft, und zwar unter Berücksichtigung von Geschlecht, Zeit und des Orts der einzelnen Bauernhöfe. Dabei legen wir geschlechts- und altersspezifische Werte des Ertrags landwirtschaftlicher Arbeit (Schattenlöhne) zugrunde, die aus einer Panelerhebung unter Jugendlichen und Haushalten auf Bauernhof-Ebene im ländlichen Äthiopien stammen.

Die Ergebnisse, die wir mit der Fixen-Effekte-Methode und der Instrumentvariablenschätzung (IV-Schätzung) mit fixen Effekten ermittelt haben, zeigen, dass Veränderungen bei ökonomischen Anreizen – wie sie Schattenlöhne darstellen – bei der Beteiligung Jugendlicher in der Landwirtschaft durchaus eine Rolle spielen. Dabei gibt es jedoch Unterschiede zwischen jungen Männern und jungen Frauen. Die Ergebnisse legen Folgendes nahe: Wenn die Landwirtschaft für die Jugend attraktiver werden soll, müssen Arbeitsproduktivität und Arbeitsmöglichkeiten gefördert werden. Zudem ist eine strukturelle Transformation vonnöten, um die Unzulänglichkeiten und Starre des Arbeitsmarktes und anderer Märkte aufzubrechen.

Jüngere empirische Studien zeigen, dass Menschen aufgrund einer Sorge um ihre eigene Stellung in der Gesellschaft aktiv werden. Aktuelle theoretische Arbeiten führen aus, dass der Erklärungsanteil in ökonometrischen Analysen größer wird, wenn wir uns jenseits gängiger (rationaler) Entscheidungsmodelle bewegen und auch Relativinteressen berücksichtigen. Bezieht man relative Deprivation – also Entbehrungen – in die Berufswahl von Jugendlichen mit ein, erhält man einen zusätzlichen Erklärungsanteil – wenn nicht gar einen alternativen Erklärungsansatz, um die Entscheidungen für die Berufswahl von Jugendlichen im ländlichen Äthiopien sowie die Ursachen der ländlichen Unterentwicklung in Äthiopien zu verstehen. Es wird angenommen, dass relative Einkommensinteressen (oder die Position betreffende Einkommensinteressen) bei Einkommens- oder Wohlstandsungleichheit das menschliche Verhalten beeinflussen – mit allen Folgen für das Wohlbefinden der Individuen.

Kapitel 3 arbeitet mit einer soziodemografischen Umfrage sowie mit umfrage-experimentellen Methoden heraus, dass sich die Sorge um die eigene Stellung bezüglich des Einkommens unter den Haushaltsmitgliedern (Jugendliche, Mütter, Väter) unterscheidet, was sich auf das Wohlergehen der Kinder auswirkt. Kapitel 4 weitet die Analyse der relativen Interessen vom reinen Einkommensbezug aus auf Aspekte sozialer Entbehrung sowie auf nicht-monetäre Faktoren (vermögensbezogene Deprivation), wobei objektive und subjektive Maße relativer Deprivation eingesetzt werden. Die Ergebnisse legen nahe, dass einkommensbezogene Deprivation einen motivierenden Einfluss hat (der von „positiven Außeneffekten“ oder „Signaleffekten“ herrührt). Demgegenüber wirken sich Entbehrungen, die das Vermögen oder das soziale Kapital betreffen (und sich aus dem Statureffekt ergeben), eher negativ auf das Wohlbefinden der Jugend aus; dabei fallen die Aussagen nach Geschlecht unterschiedlich aus.

Ein Kanal, über den sich relative Entbehrungen im menschlichen Verhalten ausdrücken, sind menschliche Entscheidungen, zum Beispiel die Berufswahl betreffend. Das Hauptziel dieser Arbeit ist es schließlich, die Auswirkungen unterschiedlicher Formen relativer Deprivation zu verstehen, indem deren Wechselwirkungen untersucht werden – und zwar sowohl jene mit den Treibern, die der Berufswahl junger Leute zugrunde liegen, als auch solche mit den Berufswahlmöglichkeiten und Entscheidungen selbst. Kapitel 5 bezieht die tatsächlichen Berufe in die Analyse ein. Dabei stellt sich heraus, dass die relative Deprivation ein starker Prädiktor für die Berufswahl sowie das Engagement in der Landwirtschaft der ländlichen Jugend ist – und zwar unabhängig davon, welche Indikatoren relativer Deprivation und Berufswahl angewendet werden. Dabei ist ein Einfluss der Präferenzen und Merkmale der Eltern zu verzeichnen.

Diese Arbeit kommt zu dem Schluss, dass die Beschränkung relativer Deprivation auf die monetäre Ebene in die Irre führen kann. Wer dies tut, erfasst nicht die tatsächlichen Effekte, die relative Entbehrungen auf das Wohlbefinden, die Berufswahl oder auch auf Arbeitsmarktanalysen haben. Außerdem deckt die Verwendung multipler Referenzgruppen und unterschiedlicher Messmethoden bezüglich des relativen Status mögliche Interventionsfelder auf, um positive externe Effekte zu verstärken. Dies ist mit konventionellen Forschungsansätzen nicht möglich. Zuletzt macht diese Arbeit deutlich, dass die gleichzeitige und kritische Berücksichtigung väterlicher und mütterlicher Attribute die Wirkung einiger wichtiger Variablen beeinflusst – und dass die Indikatoren tatsächlichen und geplanten Engagements in der Landwirtschaft stark variieren. Studien, die derartige Daten für die Analyse arbeitsmarkt-oder migrationspolitischer Entscheidungen verwenden, sollten diese Variationen und Einflüsse berücksichtigen.

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Acronyms

AELD	Adult Equivalent Labor days
AfDB	African Development Bank
AGP	Agricultural Growth Program
CAPI	Computer Assisted Personal Interviewing
CSA	Central Statistical Agency
ENLFS	Ethiopia National Labor Force survey
ESSP	Ethiopian Strategic Support Program
FAO	Food and Agricultural Organization
FE	Fixed-Effects
FE-IV	Fixed Effects Instrumental Variables
FGD	Focus Group Discussion
GDP	Growth and Domestic Product
IFPRI	International Food Policy Research Institute
ILO	International Labor Organization
MLE	Maximum Likelihood Estimation
NID	Non-monetary Relative Deprivation
OLS	Ordinary Least Squares
PA	Peasant Associations
RD	Relative Deprivation (or Relative Income Deprivation)
RE	Random-Effects
SD	Social Capital Deprivation
SNNP	South Nations and Nationality People
SRD	Self-reported (perceived) Income Relative Deprivation
SSA	Africa South of the Sahara
SSD	Self-reported (perceived) Social Relative Deprivation
SWB	Subjective Well-Being
TLU	Tropical Livestock Unit
UN	United Nations
UNDP	United Nations Development Program

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1. INTRODUCTION

1.1. Youth in agriculture in Africa and in an Ethiopian context

Africa has the highest share of young people in the world relative to the total population, with the median age of the population under 25 years old ever since data exists, a trend that is expected to continue for the coming decades, as indicated in figure 1.1 (UNDP, 2015). This demographic trend will determine the paths of structural changes, and this combined with low levels of agricultural productivity (McCullough, 2015), changing needs of youth (Assaad and Roudi-Fahimi, 2007), ill-defined land tenure policies (Pingali et. al, 1987; Amanor, 2010), lack of job creation (World Bank, 2012) and rising inequality (Milanovic, 2003) have prompted a sharp rise in youth unemployment in many Sub-Saharan African countries, including Ethiopia, with implications for Africa’s economic and social development.

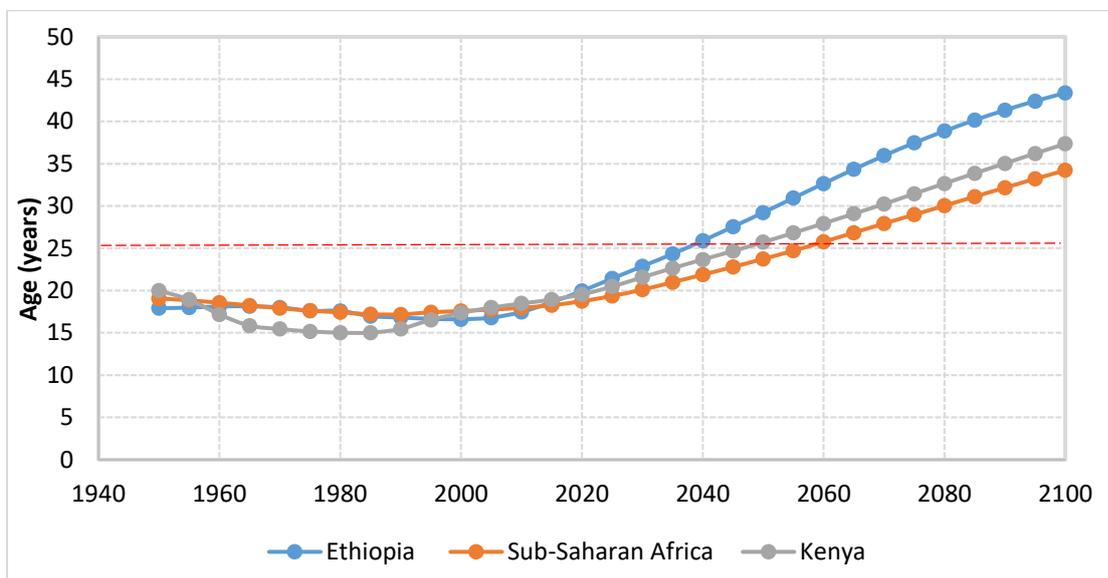


Figure 1.1. Median age of the population of Ethiopia, Kenya and SSA, 1950-2100

Source: UN Population Division 2015 revision

Note: 1950 to 2015 show historical estimates. From 2015, the UN projections are shown.

Young people make up the bulk of the labor force (primarily in the agricultural sector) and bear most of the unemployment burden. Each year, more than 10 million African youth enter the continent’s workforce, posing a great challenge for youth unemployment and opportunities (ILO, 2016). For instance, according to a CSA (2015) estimation, youth unemployment in Ethiopia constitutes 60 % of the total unemployment; and 49 % of working youth live on USD 1.90 a day or less (AfDB et al., 2012).

¹ The effect of unemployment or underemployment is not limited to loss of current income and livelihood; rather it has long-term consequences on their life-long welfare such as lower future employment and lower subsequent earnings.

¹ This estimation is based on a revised version of the poverty line in 2011.

The trend of youth employment in Ethiopia can also be examined by looking at the agricultural labor force breakdown of the youth labor force in agriculture—to- total agricultural labor force shares. Figure 1.2 below depicts the trend of labor force in agriculture in comparison to youth labor force in agriculture beginning shortly before 2000. As can be seen below, Ethiopian agriculture is labor intensive. The majority of the working group is employed in agriculture (agriculture employing 80% of the total labor force in 2004, which had declined to 75% in 2014). It also shows that while the share of labor force in agriculture (labor force in agriculture to total labor force) is slightly decreasing, youth labor force in agriculture has been gradually increasing since 2009. For instance, youth labor force in agriculture (percentage of labor force in agriculture) in 2009 was about 45% of the total labor force in agriculture. This figure has increased to 48% in 2014, further suggesting that agricultural jobs play a significant role for youth employment and is potentially the main source of job creation for youth.

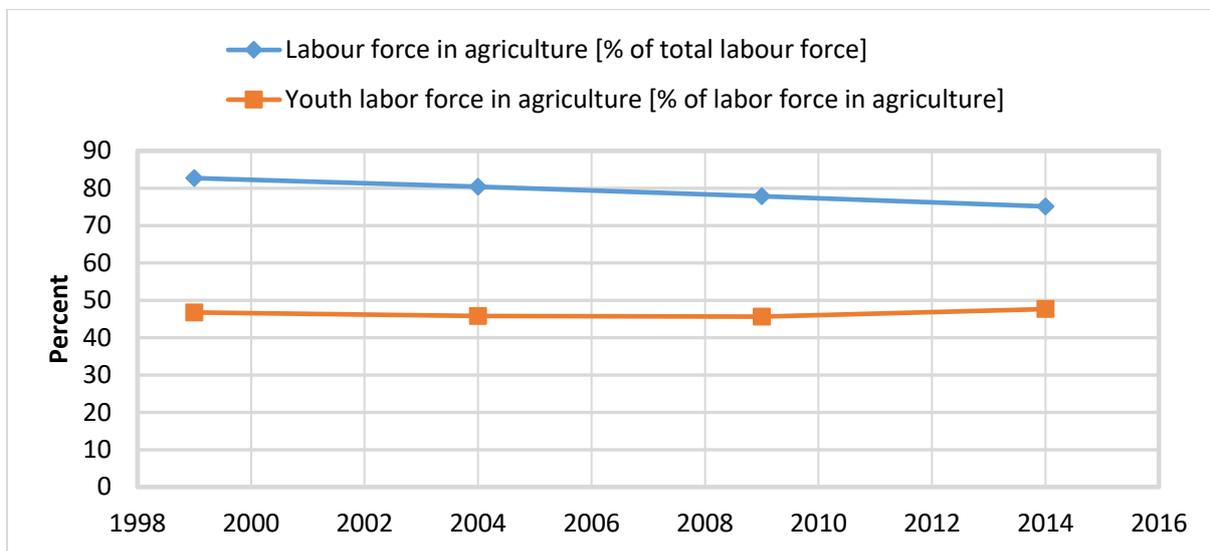


Figure 1.2: Trend of youth labor force in agriculture: Ethiopia
 Source: FAOSTAT based on ILO estimation

On the one hand, the sustainability and effective contribution of the agriculture sector to the different economic dimensions (economic growth, poverty reduction and food security) depends on the employment of youth in agriculture. A study by the Global Forum on Agricultural Research indicate that if Africa experiences a 10 percent decrease of youth involvement in farming (including family farming), GDP and agricultural outputs would fall and dependency on imports would rise (The Global Forum on Agricultural Research, 2015). Given the magnitude of employment in the continent is agriculture based, this drop could increase unemployment, creating a vicious cycle, further hampering the economy. This means that the future of African agriculture and the speed of transformation depend on the involvement of young people in agriculture. Youth are also expected to provide labor and infuse agriculture with innovation and entrepreneurial impetus that will help to realize the transformation of the sector (Anyidoho et al., 2011; Fox et al., 2016). Thus, if properly harnessed (i.e. if modernization of the production side of African agriculture is likely to happen with real structural change), this

growing working population could drive Africa's economic transformation. Thus, agriculture is the key to addressing youth employment challenge in Africa (Bernard and Taffesse, 2012; von Braun and Kofol, 2017).

On the other hand, the rising youth unemployment and lack of stable economic opportunities for young people are one of the major global challenges facing the continent. These challenges force migration, frustrations, and conflict which perpetuate poverty; which in turn undermine youth contribution to development (von Braun and Kofol, 2017). For instance, the rate of unemployment or vulnerably employed is the highest among youth compared to adults. Youth face almost doubles the unemployment rate of adults, although the figures vary across African countries (FAO et al. 2014; Brooks et al. 2012). The social, political, and economic consequences of youth unemployment and lack of stable economic opportunities can be far-reaching, as observed in the recent political unrest in many African countries including Ethiopia. Addressing youth employment and related problems requires broad-based economic reform. For instance, there is a need to shift the focus from agriculture to the agri-food system more broadly to change the picture as well as to potentially promote transformative jobs. Therefore, it is important to understand the current dynamics of youth employment, occupational choices, and factors driving these choices in agriculture in Ethiopia across space, time, and gender.

1.2. Livelihood diversification in rural Africa and prospects of youth in agriculture

Agricultural sector development policy in Africa as it relates to employment creation has three different employment outcomes: self-employed farmer or producer (enhanced remuneration from self-employed farming), farm labor (on-farm employment opportunities) and agriculture-related off-farm jobs (off-farm employment opportunities for others with forward and backward linkages, etc.) (Sumberg et al., 2013). Considerable empirical work on rural livelihoods in the past decades has shown that rural residents are not solely dependent on agriculture (World Bank, 2008; FAO, 2008). A significant number of farmers including young people engaged in off-farm activities that provide them either an additional source of income or serve as the main source of livelihood, especially for landless rural residents (Ellis, 2000; Reardon et al., 2001; Barrett et al., 2001; Bezu and Holden, 2014). Some have even argued that the pace of livelihood diversification in rural areas, including rural areas in Africa, is trending toward 'deagrarianization' (Bryceson, 2002; Rigg, 2006). For instance, studies indicate that on average, the share of non-farm income to rural household income ranges from 6% (in Mali) to 93% (in Namibia) (Reardon *et al.*, 2007); and farmers participation rate in non-farm sector ranges from 93 % for Malawi to 75% for Ghana (Winters *et al.*, 2009). In Ethiopia, the proportion of rural households who participate in non-farm employment ranges from 25% in Oromia region (van den Berg and Kumbi, 2006) to 81% in Tigray region (Woldenhanna and Oskam, 2001). Likewise, the share of non-farm income to total income varies greatly: 8% in Oromia (van den Berg and Kumbi, 2006) and 35% in Tigray (Woldenhanna and Oskam, 2001).

One insight from this body of work is that the contribution of off-farm employment is becoming an important livelihood strategy especially among young people; most young people choose unskilled, off-farm wage employment because of resource deprivation such as land and lack of viable livelihood opportunities. Self-employment is the most commonly practiced form of employment outcome (including non-farm) in rural areas. The poor performance of agriculture (which cause drops in farm income, food insecurity and fluctuations in farm income), imperfections in factor markets (land markets, insurance markets against risk, financial markets), and weather shocks are among the main drivers of income diversification for individuals and households.

Migration is the most commonly used livelihood strategy used by young people to cope with adverse effects of unemployment and underemployment in search of a better life. As indicated in Table 1.1, there are different forms of migration in Ethiopia: rural to rural, rural to urban, urban to rural and urban to urban migration (CSA, 2013b). Based on a 2013 Ethiopia national labor force survey (NLFS), rural to rural migration is the dominant form of migration (34.5%) followed by rural to urban migration (32.5%). This form of migration is consistent in pattern with that of the 1999 and 2005 NLFS (37.6% in 1999 and 46% in 2005 for rural-rural form of migration whereas it was 23.5% in 1999 and 24.3% in 2005 for rural-urban form of migration), implying that still rural employment both formal and informal sector plays an important role in youth employment. However, the trend of rural-rural migration has been decreasing since 2005 (Table 1.1). Since the main source of employment is agriculture and the dominant form of migration is rural-rural, agriculture is still playing a major role in youth employment creation and absorption. This raises skeptic to the argument that agriculture is becoming an old group occupation.

Table 1.1: Trend and forms of migration at the national level (percentage of total migrants)

Forms of migration	1999	2005	2013	Trend
Rural-Rural	37.6	46.0	34.5	↓since 2005
Rural-Urban	23.5	24.3	32.5	↑
Urban-Rural	15.7	12.1	11.6	↓
Urban-Urban	23.2	17.7	21.3	↑ since 2005

Source: CSA (2013) and own computation based on NLFS of 1999, 2005, and 2013

Decisions to explore the available distant opportunity space through migration may result in new capital, skills, information, and networks being incorporated into the rural economy. This may result in youth migration back to rural areas (Table 1.1). Despite the strong interest of youth to migrate to urban areas among many African countries, return migration to the countryside, often compelled by economic decline in urban areas, has also occurred. For instance, in Ethiopia, due to the increasing cost of urban life and limited employment opportunities in urban areas combined with attractive returns from agriculture, labor demands from families and improvement in the relative standing of youth compared to other youth groups are the drivers of return migration. Similarly, in the 1980s, the collapse of copper

mining forced Zambians to migrate back to rural areas (Ferguson, 1999), and in Benin, unemployed graduates returned to their villages since job opportunities in the public sector became increasingly limited and labor force growth is faster than the economy (Bierschenk and Sardan, 2003). In Cote d'Ivoire economic decline provoked unemployed young people to migrate from cities to the arable rural areas (Banegas, 2006).

For young people in rural areas living in poverty, and where information, as well as resources, are limited to make meaningful livelihood decisions (such as decisions to diversify livelihood alternatives, develop one's human capital, or whether or not to migrate), is complex. Often most decision-making processes occur under conditions of uncertainty, scarcity, and social pressures. This can further bias or complicate the choices young people make. Thus, viewing young people's occupational choices and understanding the drivers of such choices require innovative research approaches that enable the analyses by incorporating behavioral or psychological factors. I will elaborate on how and why incorporating such factors in the analyses of young people's occupational choices is important in the following section.

1.3. Beyond resource deprivation and youth occupational choices

Development debate related to youth employment should move beyond the resource related deprivation and consider behavioral factors in shaping young people's decision-making and labor force participation in Ethiopia, with consequences on individual and household well-being outcomes. In doing so, it may require a new set of development approaches which views people in general and youth population group, in particular, more fully and recognize that a combination of behavioral and social forces affect and shape young people perceptions, cognition, and decisions. What is evident and common in the existing literature is that much of the focus to youth employment is on the importance of material well-being (Barrett et al., 2001; Bezu and Holden, 2014; Sumberg et al., 2013).

Though much of the discussions and policy discourse around youth (employment) in rural areas in Africa in general and Ethiopia, in particular, is related to resource constraints such as land and other material resources; behavioural (psychological) factors also play a significant role in shaping young people's interests and behaviours, especially in relation to occupational choices, migration decisions, and well-being outcomes. Put differently, the current discussions of youth (un)employment mainly focuses on the absence of resources such as land, labor market, lack of opportunities, political factors; and mainly ignores how might the sense of relative deprivation experienced by the youth themselves and the information set that derives their livelihood choices which would eventually affect their behaviour (such as economic decisions). Behavioural factors that shape occupational choices of rural young people include rising aspirations, relative concerns (or relative deprivation- interpersonal wealth comparisons), gender norms and changes in the labor market conditions (Sumberg et al., 2017; Stark, 1991; 2013). As an increasing body of evidence is showing, beyond the material deprivation,

psychological and behavioral factors resulting from relative concerns are equally important to understand how comparisons with others impinge individual's sense of well-being and influences behavior, including in relation to migration decisions and occupational choices. The recent empirical work has raised doubts about the notion that economic growth or an increase in absolute incomes (absolute motives) alone leads to an increase in the welfare of people (Easterlin, 1974, 2001, 2005; Alpizar et al., 2005; Clark et al., 2008). Rather well-being or economic decisions, such as labor force participation decisions and migration decisions especially among young people, depends to a larger degree on other factors such as relative motives, on what they see around them. In other words, beyond absolute income and material possession, relative deprivation plays an important role in shaping economic decisions (labor supply decisions, for instance), consumption decisions as well as to set goals in life.

Therefore, tackling rural poverty, transforming the economy, generating employment opportunities for young people, and making use of Africa's young people (demographic dividend), requires understanding the role of relative concerns and the extent to which such concerns and related factors explain the decision-making behaviour of young people and the context in which decisions are made. This, in turn, helps to equip the youth of tomorrow with the right tools by providing alternative livelihood sources.

1.4. Statement of the problem

Despite the increasing awareness of the importance of youth participation in development and political discourse, young people are not properly located in the development debate and dialogue for impactful policy design. In recent years, however, governments at national, international as well as core institutions such as the African Union, African Development Bank, The World Bank, national governments and the United Nations, adopted a number of policies and initiatives, and embarked on a number of reforms (World Bank, 2010; AfDB et al., 2012). For instance, the world's governments adopted the Sustainable Development Goals (SDGs) which put much emphasis on the employment, inequality, and poverty eradication to achieve a sustained increase in living standards (UN, 2016). SDG goals also explicitly state that there is a need to empower youth in vulnerable situations for the full realization of their rights and capabilities, promoting youth employment to help countries reap the demographic dividend (UN, 2016). African Development Bank has recently launched a five years program of creating youth employment "Jobs for youth in Africa" (AfDB, 2016). Youth employment and related issues have also attracted the attention of mainstream economic development discussions since the 1990s, following the effects of economic recessions caused by the various currency and debt crises. Considering the importance of youth involvement in agricultural and rural development policy in Africa, Ethiopia in particular, and its strong and favourable impacts on agricultural productivity, innovation and entrepreneurial stimulus, rural poverty reduction, reduction of unemployment and food

security, it is important to understand and analyse factors that determine the outcome of youth involvement in agriculture.

Youth employment creation programs in agriculture, which many African countries are embarked on to curb unemployment as well as to attract young people into agriculture, is not an end in and of itself. The success of such approaches and programs depends on the wage levels and/or the returns accrued from the sector. This also depends on understanding how households allocate their family labor to on and off-farm work. There is little information and empirical evidence that captures the dynamics on the link between intra-household labor productivities, and youth agriculture (dis)engagement decisions (Kögel, 2005; Bezu and Holden, 2014; Palacios-Lopez et al., 2017). Thus, examining whether youth agricultural labor supply is responsive to such wage differentials, especially agricultural shadow wages, is vital for designing proper development programs that can contribute to the solutions of the rural youth unemployment problem.

As stated earlier, studies on rural youth in Africa have concentrated on the role of resource deprivations such as lack of land, access to credit, and lack of agricultural technologies as core determinants of youth agricultural and rural employment and migration decisions (Ellis, 2000; Reardon et al., 2001; Bezu and Holden, 2014). One of the basic assumptions rooted in these studies is that addressing these barriers – many of which are structural- would ultimately address the problems of youth unemployment, rural poverty and eventually result in wealth accumulation that in turn prompts growth. As Sumberg et al (2017: 151) summarize in their recent work, “these are the same barriers that have been the focus of agriculture and rural development efforts over decades”. However, the trust to ensure that young people can achieve economic efficiency, social equity, as well as aspirations to life (through creating access to resources or resource provision) does not seem to correspond to the troubles in the youth employment structure and recent trends. These studies make assumptions about the behavior and decisions of young people. An increasing number of development programmes as well as empirical studies place little emphasis on the role of attitudes and behavioral factors, in addition to resource deprivation, in understanding drivers of youth occupational choices and decisions (Kögel, 2005; Bezu and Holden, 2014).

Yet some recent empirical work provides evidence that people take actions out of a concern for relative standing. Recent theoretical work also illustrates that more can be explained if we move beyond the standard choice theory and recognize relative concerns (Stark and Wang, 2000; Easterlin, 2005; Stark, 2006). A large body of literature from economics (though it has been slow to take root), sociology, psychology, and neuroscience, for instance, indicates that humans routinely engage in interpersonal comparisons (Runicman, 1966; Townsend, 1997; Johansson-Stenman et al. 2002). Such engagement in interpersonal comparisons affect their sense of well-being, and influences their behaviour, including relationships to livelihood decisions such as migration decisions (Stark and Taylor, 1991; 1992; Stark,

2017), labor force participation of wives (Park, 2010), consumption choices (Sapp and Harrod, 1989; Runicman, 1966; Townsend, 1997), financial decisions and fairness concerns (Fehr and Gächter, 2000) and well-being (Pingle and Mitchell, 2002; Johansson-Stenman et al. 2002; Andolfatto, 2002; Stark and Fan, 2011; Stark and Hyll, 2011; Jagger et al., 2012; Stark, 2017). For instance, Stark (2017:1) noted that “[...]people are discontented when their income, wealth, consumption or social standing falls behind that of those who constitute their ‘reference group’, making them take certain actions.” Andolfatto (2002) shows that individuals are adversely affected by the material well-being of others in their reference group when this well-being is far below their own. The notion that people are concerned about their relative position is more pronounced among young population groups (Pingle and Mitchell, 2001). The recent protest and uprising in most African countries suggest this. Recent empirical evidence in economics also show that lagging behind others in income (or wealth) in comparison to that of those who constitute ones “comparison group” could serve as a source of motivation, in the sense that the desire to escape low status (or rank) or ‘to keep up with the Joneses’ makes individuals or workers likely to exert more effort (Ulph, 2014; Park, 2010).

One of the main lessons from these bodies of work is that productivity-enhancing policies are necessary but not sufficient to achieve desirable rural and youth-related development. Incorporating relative deprivation in youth occupational choices provides a complementary explanation, if not an alternative explanation; to better understand occupational choices of rural youth in Ethiopia. Despite the fact that understanding relative concerns is important— due to their critical influence on behavior, well-being and other related issues— lack of comprehensive evidence on who actually compares and to whom, and whether such comparisons count enough to influence youth behaviors and decisions remain unclear. Often the existing studies suffer from methodological bias, data limitations, and empirical inadequacy in order to design evidence-based policy for growth and employment in developing countries (Oya and Pontara, 2015). Since relative deprivation is highly endogenous to the model, conclusions based on cross-sectional data could be misleading. In addition, this thesis uses different triangulating measures of relative deprivation and studies how the use of the different measures of relative deprivation might affect the predictions of outcome variables of interest: namely well-being, occupational choices, or migration outcomes. As Stark (2017:3) noted ‘models based on ordinal rank may predict very different behavior from models based on cardinal rank’. Surprisingly, the literature is silent on empirically testing the robustness of the different measurements, such as the role of distaste for low ordinal rank as an alternative explanatory variable to distaste for low cardinal rank in predicting migration decisions, labor participation decisions, and/or welfare outcomes. This calls for proper methodological applications as well as the use of panel data to overcome those inherent limitations prevalent in the existing literature.

Unlike the conventional approach to modeling decisions and behaviors (or welfares), the use of relative deprivation approach supplements the received empirical inquiries in four ways. First, despite

remarkable reductions in absolute poverty, relative poverty has risen over the last two decades. Thus, relative deprivation helps to reflect on conditions of worsening poverty (relative poverty) (Easterlin, 1997, 1995; Stark and Taylor, 1991; Alpizar et al, 2005). Second, relative deprivation is a measure of inequality—an important policy target of many countries (Yitzhaki, 1979). This concept could explain the current growing disparity between youth and other population groups across time and space. For instance, incorporating relative deprivation in youth labor participation analysis might help to provide a complementary, if not an alternative explanation, to the considerable gender differences existent in the labor markets of developing countries. Third, relative deprivation helps to understand a number of factors related to life satisfaction or well-being (Ferreri-i-Carbonell, 2005). Finally, relative deprivation measures are consistent with the large body of scientific evidence in public health, psychology, and economics (Deaton, 2001) in predicting decisions outcomes such as migration decisions or welfare outcomes. Thus, more can be explained if we move beyond the conventional approach (standard theory) to recognize relative concerns.

The decision of youngsters or teenagers to engaging in agriculture not only depends on youth's own choices or employment preferences driven by their capabilities and behaviors but also depends on the preferences and attributes of parents (families) and communities (Marilena, 2015). This differs significantly based on gender and age of youth, the background of parents, and behavioral responses of parents (Attanasio and Kaufmann, 2014). Yet, there is a huge gap in the literature in this regard. There are no adequate empirical works that examine the role of parents in shaping/influencing the employment preferences and well-being of children, particularly that of youth, nor does it study how parents' attitudes toward positionality might affect the occupational choices of their children, and the corresponding intra-household resource allocation consequences (Kazianga and Wahhaj, 2017). Particularly, this research will contribute to the literature on the role of parents distaste for low social status (positional concern) in shaping the employment preferences and migration decisions of youth in the context of the rural setting. Such analysis also contributes to our understanding of the mechanisms through which relative wealth concerns might affect well-being as well as individual behavior involving employment decisions. Therefore, tackling youth unemployment (particularly those living with their parents) and underemployment, and for optimal outcome of interventions aimed at young people requires understanding intra-household resource allocation, human capital development as well as economic independence. Thus, my analyses in this regard will serve to identify and analyze the potential role of parents in shaping the employment preferences and well-being of their children.

1.5. Research questions

The study explores the following research questions:

1. What are the trends, patterns, and prospects of youth in agriculture in Ethiopia [by gender]?

2. How does marginal productivity of youth labor (shadow wages) affect agricultural labor supply decisions of youth?
3. What are the determinants of youth and their parents' positional income (or wealth) concerns?
4. How do parents' attitudes toward positionality affect the well-being of rural youth in Ethiopia?
5. How might household's relative deprivation [of different dimensions] affect the well-being of young people in Ethiopia?
6. How do household's relative deprivations affect (or shape) young people's occupational choices?

1.6. Overview of the data and methodology

The study uses data from the Ethiopian Agricultural Growth Program (AGP) survey, a detailed agricultural panel survey carried out in 2010/11 in four major regions (Oromiya, Amhara, SNNP, and Tigray) and in the Oromiya region in 2014/15 on sub-sample of households and youth. AGP is a five-year program of a component of the broad effort aimed to increase smallholder productivity and value addition in the agricultural sector with increased participation of women and youth. The Central Statistical Agency (CSA) and the Ethiopian Strategic Support Program (ESSP) of International Food Policy Research Institute (IFPRI) implemented the first wave of a survey jointly during July 3-22, 2011. The second wave (follow-up) was carried out during the months of December 2014 and January 2015.

Out of the four regions of AGP sites, this study focuses on Oromiya (figure 1.3) and exclusively on youth members and youth-headed households sub-sampled from the region. Multi-stage sampling techniques were employed to sub-sample households with youth members and youth-headed households during the second wave. In the first stage, the fresh listing of AGP woredas² from Oromiya covered during baseline was prepared. Accordingly, woredas in the region were sorted in descending order based on youth population size, then randomization was applied to select the predetermined 12 woredas. Each woreda contains 3 enumeration areas, thus, a total of 36 enumeration areas were covered during the second wave. In the second stage, a fresh listing of all the households covered during baseline for the 12 sub-sampled woredas. Each woreda contains 78 households. Households who were without youth members were dropped from the fresh listing. Following that, a total of 525 households with youth members and youth-headed were randomly selected from the 12 selected woredas. Reappointment was made if a member of the qualified households was not available at the time of appointment. Households that met the criteria but were unavailable due to either death or migration, which made tracking difficult, were replaced from the contingency list. Accordingly, the empirical analysis is based on a panel survey of youth individuals drawn from 525 households in 36 enumeration areas of Oromiya region. Detail sample selection and distribution of the sample size across the selected weredas is presented in the next chapter. In this analysis, youth is defined to be within the age interval of 13 to 34. There is no consensus regarding the

² Worada is equivalent to district.

age bracket that defines youth. For instance, the UN defines youth as persons within the age interval of 15 to 24 and adults are as 25 years and older. The African Youth Charter extends the upper age bracket to 35 (thus, defines youth as persons between the ages of 15-35). Ethiopia's National Youth Policy defines youth as persons between the ages of 15-34. Given the Ethiopian rural context, especially children's participation in wage employment in contribution to rural household income starts at their early age (as early as 7 years) (Admassie, 2003) and considering Ethiopia's National Youth Policy of the definition of youth; in this study, I define youth over the age interval of 13 to 34 years in this study.

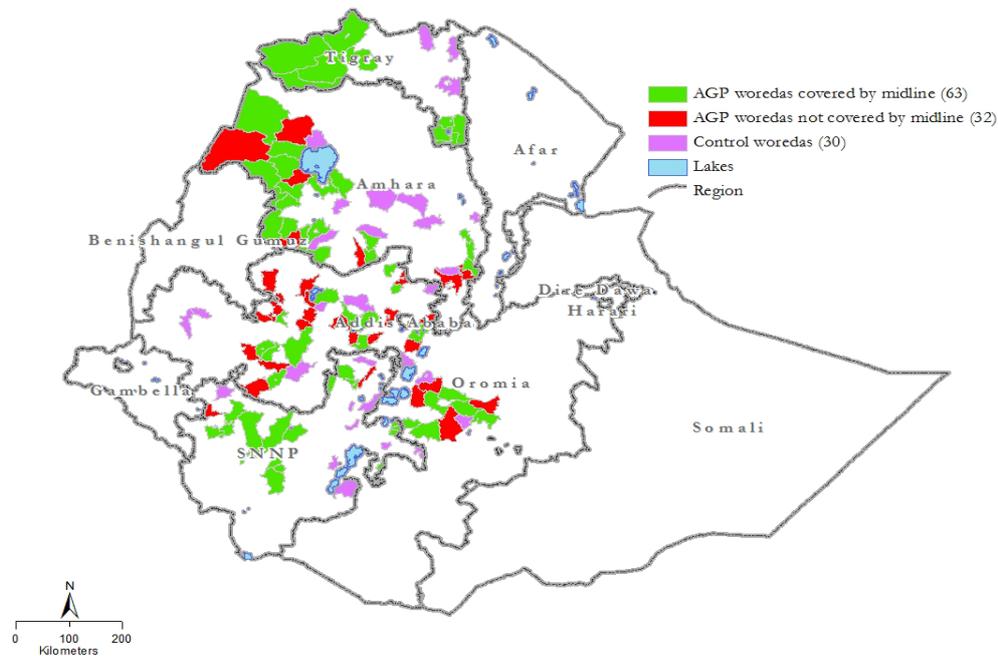


Figure 1.3: AGP woredas-location of the study sites

1.7. The conceptual framework

Figure 1.4 below presents the overall conceptual framework that guides the thesis. The framework depicts the possible channels through which relative deprivation and other related factors might be linked to various decisions or economic outcomes (through affecting behaviors). To begin with, institutions and policies are the arrangements and processes through which interactions are transformed into outcomes, which could be negative and positive. Policies and institutions facilitate, mediate, or determine access to material as well as human resources necessary to translate into opportunities that in turn determine well-being outcomes or labor market participation decisions of young people. For instance, institutions and policies determine youth' and their parents' access to basic resources such as land, water for irrigation, access to finance, etc., which would affect the livelihood pathways of youth. Policies and institutions also determine structural changes that enhance the productivity of agricultural sector and the linkages with other sectors and allowing greater mobility or allocation of labor between or across sectors.

While constraints on access to material resources such as land and other factors of production are important determinants of youth occupational choices in agriculture or outside, relative concerns (or relative deprivation) forces youth to take actions such as increasing labor participation by working longer hours or migrating to other places out of concerns for such relative standing. Rising relative deprivation or the feelings of relative deprivation causes people to react to their exposure to (increased) relative deprivation in a variety of ways. Relative deprivation affects individuals' or households' behaviors and decisions, hence occupational choices through different channels. First, the feelings of relative deprivation may motivate or force a relatively deprived individual or household to work hard and/or supply more labor time in order to improve their relative standing. This could happen without necessarily changing occupation or migration. For instance, an individual may work more hours than before or may be motivated to invest more to expand farmlands, improved seed, and other innovations in order to improve his/her relative standing in their reference groups. Second, relative deprivation may induce migration. In this context, RD causes either shifting occupation from saying farm employment to non-farm employment or diversification of livelihood strategies. As a result, labor supply to agricultural activities may decrease. This is especially the case for those who are able to fund the rising cost of migration and who find limited employment opportunities within agriculture. The rich or less deprived will have less incentive to migrate.

Social networks (and social deprivation) can be both a driver of and barriers to, occupational choices such as internal migration. It appears that existing individual or family or friend networks in certain space are a key precondition and/or facilitating factor driving labor participation or migration decisions. This networks/social capital function should provide young people with information for viable decisions and access to opportunities. On the contrary, the presence of family ties or friends networks can also appear to operate as a barrier to migration or explore certain employment opportunities available at distant places. Thus, social deprivation can function as a push and a pull factor that influences decisions, and thus, the effect on well-being depends on whether it serves as an opportunity or a barrier.

In addition to the effects of relative deprivation, absolute deprivation and absolute wage gains and other resources (as the standard economic theory suggests), play an important role in driving the labor supply and migration decisions of individuals or households to improve their well-being. These deprivations can be categorized as pull and push factors. Push-factors related to the performance of agriculture which includes the basic production potential given available technologies and agro-ecological characteristics and risk factors (which cause drops in farm income, food insecurity and fluctuations in farm income), imperfections in factor markets (land markets, insurance markets against risk, financial markets), and

weather shocks are among the main drivers of youth employment preferences. The higher returns to labor and capital in non-agricultural employment attracts more youth employment that could result in more out-migration or more labor time allocation to non-farm sectors if there are strong and vibrant non-farm sectors in rural areas.

Moreover, whether and to what extent youth engage in the non-farm sector or out-migration also depends on the capacity of youth (individual capacity) or their parents (parental factors), which includes human, physical and other capitals. Limitation in one or more of these capitals may restrict resource-poor individuals and households to stay in low paying activities as they could not afford the rising cost of migration to engage in relatively better-paying jobs or to diversify their sources of income. Absolute deprivation and the mechanisms through which absolute deprivation likely affect youth labor participation decisions, hence well-being is elaborated below.

Own characteristics (or individual capacity) plays a significant role in making appropriate decisions. Youth set their intention and hence their decisions, based on their own goal and the feelings they perceive about themselves, their parents and what societies place upon them. The decision of youngsters to engage in agriculture not only depends on the motivation or aspiration of a youth but also depends on parents' decisions and investments and this can vary depending on the age, gender, and other factors. For example, the decision on schooling or migration by families is important factor determining whether individuals work in agriculture or elsewhere and this is highly influenced by the characteristics and background of the youth's parents. Parents transmit knowledge and inspire their children favorably, influencing both what their children are capable of and what they want to do. Thus, parents can contribute insights into the formation of preferences which would affect the occupational choices of youth. Communities and societies also play a significant role in shaping or influencing the behaviors and decisions of youth opting for farming or migrating.

Modern agricultural technologies and increased productivity of agriculture can increase youth likelihood of choosing occupations in agriculture. On the other hand, Bosurup (1965) and von Thünen (1826) showed that resources constraints used in agricultural production such as land constraints, improved access to markets, or both can create positive pressures to intensify agricultural production and productivity for participants, which may result in agricultural innovations, thereby hence increasing labor participation of youth and their well-being.

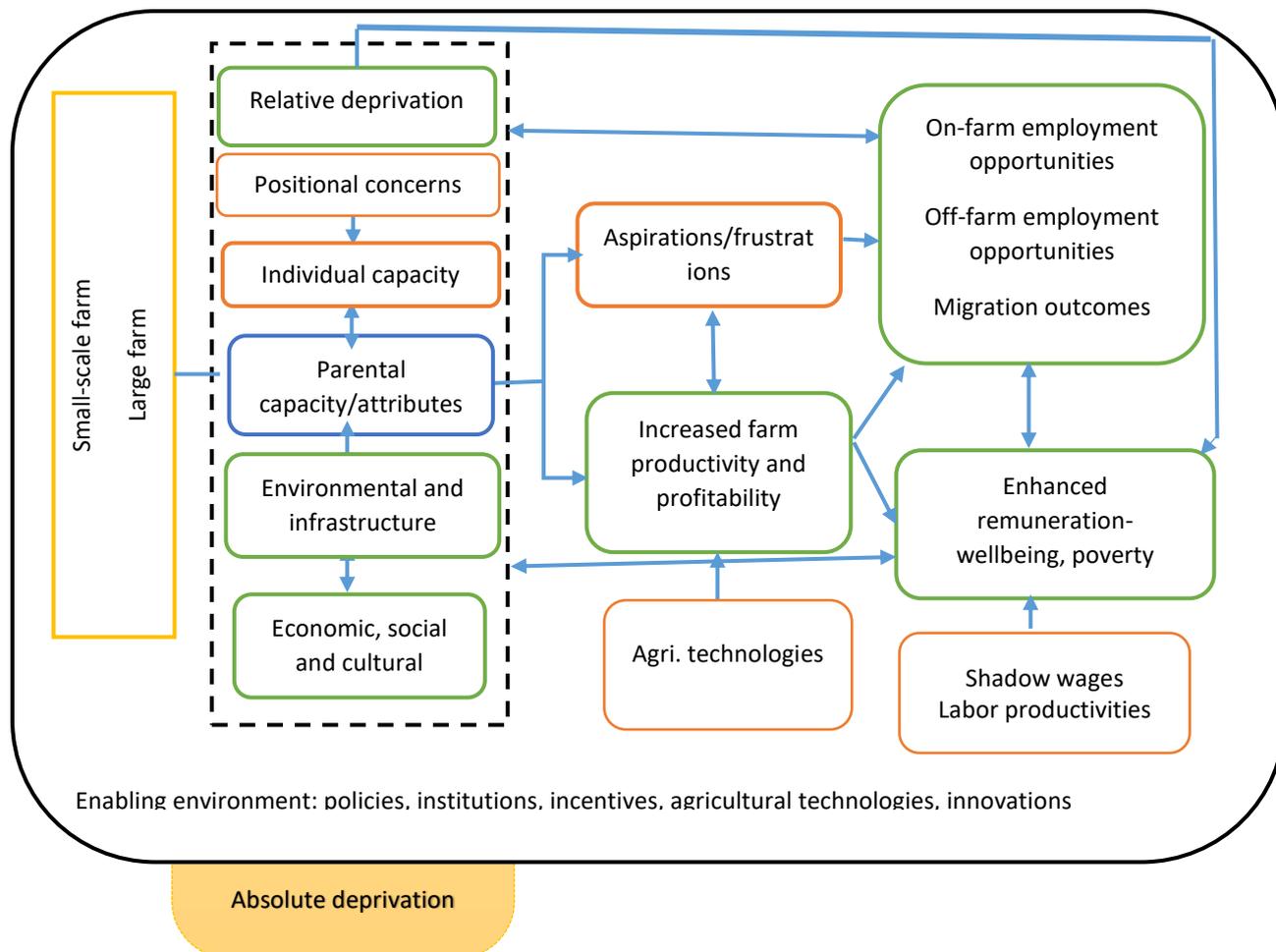


Figure 1.4. Channels through which relative deprivation and other related factors affect occupational choices and well-being of young people
 Source: Own conceptualization based on the reviewed literature

1.8. Organization of the thesis

The thesis is further structured into four main chapters, and a general conclusions and recommendations chapter. Chapter two starts with exploring the current states of affairs (slightly different from other chapters but interrelated), and is organized in different parts: a brief description of the current state of affairs (youth and agriculture in Ethiopia), detail empirical estimation strategy employed to estimate youth labor supply followed by the presentation of results. The overall objective of the chapter is to analyze trends, patterns, and prospects of youth in agriculture, thereby examining whether youth labor supply is responsive to rural shadow wages (marginal labor productivities).

The remaining chapters of the thesis are organized to empirically investigate whether beyond resource deprivations; the feeling of relative deprivation affects or shapes the well-being and occupational choices of young people. I empirically explore that young person compare their life condition (income, wealth, social capital) to that of others (their comparison groups) and such comparisons are driving

youth economic decisions such as labor participation decisions, migration decisions, with consequences on well-being. In doing so, the third chapter presents the relationship between parents' positional concerns and youth well-being using survey experimental approaches. The chapter presents whether intra-household positional concerns matter for young people. It presents then the determinants of positional concerns for fathers, mothers, and youth themselves. As such, the chapter investigates both the prevalence and the determinants of youth's own and their parents' positional income concerns, and their association with the life satisfaction of young people, with implications on intra-household resource allocations.

The fourth chapter extends the analysis of the role of (household) relative concerns and/or relative deprivations in youth well-being. I do so by examining the impact of the different dimensions of relative deprivations (disaggregated along income, non-income, and social capital) on youth life satisfaction (subjective well-being). The chapter discusses in detail and tests whether relative deprivation is likely to impose substantial welfare gain or loss. The discussions in the chapter are organized along two main parts in line with the two measurement approaches employed to capture the effect of relative deprivation on the well-being of young people: cardinal and ordinal approaches.

In chapter five, I develop the link between household's absolute and relative deprivations and youth occupational choices (mainly youth's labor participation decisions and propensity to migrate decisions). In other words, this chapter extends the empirical analysis of how and in what way parent's relative deprivation (or income, non-income and social capital comparisons) is driving youth behavior and decisions, mainly occupational outcomes (i.e. youth's labor participation decisions in and outside agriculture and migration decisions).

The final chapter, chapter six, is the synthesis and summary of the previous preceding chapters. Summarizing the key findings in each chapter, I draw lessons, conclusions, and recommendations.

2. RURAL SHADOW WAGES AND YOUTH AGRICULTURAL LABOR SUPPLY IN ETHIOPIA: EVIDENCE FROM FARM PANEL DATA

Abstract

The majority of the youth in Ethiopia lives in rural areas where agriculture is the main source of livelihood. Using gender and age-specific values of agricultural labor return (shadow wages), I systematically analyze trends, patterns, and prospects of youth's labor supply in agriculture across space (farm locations). I also analyze whether the household male or female youth members' agricultural labor supply is responsive to economic incentives. I investigate these using shadow wages estimation techniques applied to farm-household panel data collected during the 2010/11 and 2014/15 agricultural seasons. The results indicate that trends and patterns of the youth's involvement in agriculture vary across gender and farm work locations, and so do their labor returns. Yet the on-farm participation for youth members is declining across time irrespective of gender, whilst their participation in off-farm activities is increasing. The findings also suggest that changes in agricultural shadow wages matter for the youth's involvement in the sector, but their impact differs for male and female youth. The results are consistent after controlling for individual heterogeneity, sample selection and instrumenting for possible endogeneity. In addition, I find that youth's intentions and realized engagement in agricultural production vary greatly. This suggests that the frequent narrative of youth disengaging from agriculture may be a result of methodological flaws or data limitations. Taking into account the intensity of the youth's involvement in family farm, own farm and off-farm work, the results challenge the presumption that youth are abandoning agriculture, at least in agricultural potential areas of Ethiopia. Instead, the youth's involvement makes an important economic contribution to the operation of the family farm. Therefore, it is necessary to invest in agricultural development to enhance labor productivity and employment opportunities, and in the structural transformation that addresses the imperfections and rigidities in labor and other input markets to make agriculture more attractive to youth.

Keywords: youth, labor productivity, shadow wage, economic incentives, shadow income, agricultural labor supply

2.1. Introduction

The composition of the population and its distribution across the globe indicates that Africa South of the Sahara (SSA) has the world's youngest population and is home to over 200 million young people (aged between 15 and 24 years). This trend is expected to continue for the coming decades. Seventy percent of youth reside in rural areas and are employed primarily in the agricultural sector (Omoti, 2012). This poses a great challenge for youth unemployment, but also an opportunity for youth to become the engine of the development of new agricultural enterprises in farming, research, processing, packaging, and retailing foodstuffs. As is the case in most developing countries, agricultural labor in Ethiopia is mainly composed of unpaid family work and self-employment (CSA, 2005). Rural youth

are the dominant contributors of agricultural labor and constitute the lion's share of the population of Ethiopia.

Literature on the analytical or empirical estimation of the labor demand and supply decisions of agricultural households in developing countries extensively uses the empirical advantage of separability (see for instance, Singah and Strauss, 1986; Barnum and Squire, 1979; Rosenzweig, 1980; Benjamin, 1992; Bezu and Holden, 2014; Ahaibw et al., 2013; Agwu et al., 2014). When labor markets are imperfect, a common feature of developing countries, including Ethiopia, empirical results based on such an approach is likely to mislead policy conclusions. Indeed, a growing literature has indicated that empirical findings cast doubt on the perfect substitutability of farm labor and demonstrate the importance of the gender division of labor as well as the inappropriateness of aggregating the different age groups of a household labor force (Dupraz and Latruffe, 2015; Su et al. 2016). Specifically, existing studies on youth employment often suffer from methodological bias, data limitations, and empirical inadequacy. Most studies use the aggregated or homogenous approach of measuring labor supply of agricultural households (Benjamin and Kimhi, 2006; Ahearn et al., 2006; Jacoby, 1993; Skoufias, 1994; Kien, 2009; Dupraz and Latruffe, 2015). As a result, it is difficult to distinguish whether and to what extent labor is spent on-farm and/or off-farm and on which household members and age categories the analysis is focusing. In addition, the literature on youth's employment in agriculture is scant and the findings are inconclusive as to whether youth are leaving agriculture or not (Bezu and Holden, 2014; Ahaibw et al., 2013; Agwu et al., 2014). Furthermore, there is little empirical evidence documenting the rapidly changing number of working hours for different age cohorts and the subsequent effects on agricultural production and productivity (Calves and Schoumaker, 2004).

In fact, a closer examination of the existing literature suggests that the recurrent narrative of youth exit from the agricultural sector does not reflect the trend and patterns of participation in agriculture but may rather arise from methodological issues. Data limitations (especially the absence of panel data) and empirical inadequacy have also contributed to the inconclusive findings. Often the existing studies use stated intentions (for instance, intention to stay in or exit from agriculture, or having agriculture as a primary occupation) as an outcome variable rather than the realized time spent in agriculture in analyzing youth participation in agricultural activities. The main problem with this type of analysis is its inadequacy to capture realized engagement of youth as well as other household members in agriculture across time, space, and gender. Evidence shows also that realized engagement and intentions vary greatly (Omoti, 2012).

Methodologically, working with shadow wages allows accounting for the simultaneity between production and consumption decisions of the household and its members (Deolalikar and Vijverberg, 1983, 1987; Jacoby, 1993; Skoufias, 1994; Schultz, 1999; Benjamin and Kimhi, 2006; and Chang et

al., 2012). Non-separability may arise for several reasons: binding labor time constraints in off-farm employment, imperfect substitutability between family labor and hired labor; farmers or youth preference towards on-farm or off-farm employment, to list a few. For instance, Chang et al. (2012) argued that the validity of the separation method depend crucially on whether the availability of agricultural off-farm jobs is limited or not. As we will show empirically later, in line with Bedemo (2013), the non-separability assumption best fits the Ethiopian rural setting.

Migration history in Ethiopia also shows that rural youth prefer rural over urban destinations (CSA, 2013). A recent survey indicates that more than 55 percent of youth migrants in Ethiopia went to another rural area, where they tend to find work on large farms or plantations as hired laborers (de Brauw, 2014). The same study indicates that those who migrate from urban back to rural areas account for 13 percent. These figures are also consistent with the recent national statistics on migration. This reflects that rural employment opportunities (e.g. off-farm labor) play a vital role as drivers of internal migration and as a source of livelihood for participating youth or households. Hence, it is important to analyze how off-farm employment is supporting the livelihood of the rural youth, how it has evolved over time, and what explains this evolution.

There are several reasons why it is necessary to analyze the link between youth labor supply in agriculture and labor productivity in the presence of imperfect labor markets. First, agriculture is the main source of livelihood for rural people, including the youth. In addition, higher agricultural productivity and/or labor productivity make the incentive to move out of agriculture less attractive. As productivity increases, wages rise and thus labor supply increases. In some seasons and places, wages in agriculture are higher than wages in other sectors. Furthermore, the rising productivity in agriculture and rising urban unemployment is expected to force rural youth to migrate back to rural areas. There are well-documented studies on the impact of out-migration on agricultural productivity or vice versa (de Brauw, 2014; Bezu and Holden, 2014). However, there is scant information on the link between labor productivity and the youth's labor supply. Second, youth individuals, especially those living with their parents, are at the age in which they make decisions about when to finish their schooling (for those in schools), where to work, and what type of work to pursue after their education is completed. Third, Ethiopian agriculture is manual labor intensive, and the youth are typically considered among the most productive manual laborers. Thus, it is crucial to analyze whether youth labor supply is responsive to economic incentives such as shadow wages. Finally, the household needs to use surplus labor time among its members to buffer household income and/or to reallocate family labor due to low on-farm returns, it is easy to do so using youth labor, especially for off-farm activities. Youth are less likely to migrate with children or the remainder of their family. The increasing trend of off-farm employment in rural areas is an indication of this (Bezu and Holden, 2014; Bachewe et al., 2016).

This suggests that it is important to look at whether and how the youth's labor supply in agriculture, on- and off-farm, is responsive to agricultural wages (rural shadow wages), and whether this differs across gender and labor categories. It is equally important to examine what factors determine these dynamics and whether agriculture could also be a potential source of employment and under what condition it offers opportunities for youth employment.

The study goes beyond the previous studies in several ways. First, unlike the previous literature on the topic, I work with plot-level realized time spent by different members of the farming households, disaggregated by gender and age, across several years. I feel that this is an improvement from studies working with stated intentions of labor allocation or categorical definitions of the activities (e.g. "primary involved in agriculture"). This enables us to also examine the intensity of youth's participation in agriculture. Second, I apply the non-separability approach to estimate and analyze the agricultural labor supply of youth. This approach accounts for simultaneity between production and consumption decisions of the households and widespread labor market failures (Deolalikar and Vijverberg, 1983, 1987; Jacoby, 1993; Skoufias, 1994; Schultz, 1999; Benjamin and Kimber, 2006; and Chang et al., 2012). This approach provides better analysis and fits to the Ethiopian rural setting. Third, the panel data allows us to control for the possible sources of endogeneity, a common problem often unsatisfactorily addressed in the existing studies. Finally, migrant youth who left the household to work elsewhere were tracked and included in the analysis. This provides more accuracy in assessing youth involvement in agriculture across gender, space, and time. It also avoids a selection bias in the sample of youth.

The objective of the study is twofold. First, I analyze the trends, patterns, and prospects of youth's involvement in agriculture by gender and labor type (on-farm and off-farm). Second, I examine the determinants of youth's supply of farm labor. Specifically, I examine the effects of gender and age-specific rural shadow wages on youth labor supply at farm-level in agricultural potential areas of Ethiopia. The result suggest that trends and patterns of youth involvement in agriculture vary across gender and work locations, and so do their marginal products. In addition, changes in economic incentives such as agricultural labor returns (shadow wages) matter for youth involvement in agriculture. However, the impact of it induces different outcomes for male and female youth labor supply. My estimation approach tests the existence of separability - the hypothesis being strongly rejected in the estimation in favor of a non-separable model. Moreover, I find that realized engagement and intentions vary greatly, suggesting that narrative about youth exiting agriculture is founded on data, methods, and models rather than effective trends and patterns. The remainder of the paper is organized as follows: part 2 is a brief description of the theoretical model. Part 3 presents the background and a detailed data description. Part 4 provides descriptive statistics. Part 5 describes the empirical estimation

strategy for youth's labor supply functions. Part 6 presents the results of the econometric estimation and Part 7 tests the separability assumption. Finally, Part 8 concludes and discusses policy implications.

2.2. The theoretical model

Farm labor input differs not only between men and women, but also according to age, and so does labor productivity. Hence, I extend the notion of farm household time allocation model to estimate the labor supply of youth, disaggregating the farm household agricultural labor in terms of gender and age groups. I use a utility maximization approach based on the model of structural time allocation of the agricultural household members (mainly youth male and female members) (Becker, 1965; Manser and Brown, 1980). In this approach resource allocation decisions (including time) of rural residents is a constrained optimization problem. The model employed here is a version of Gronau (1977) modified by Jacoby (1993) and employed by Skoufias (1994). Economic decisions such as supplying labor are significantly affected by choices made within households. Each type of labor input is specified as having a different effect on agricultural output and evolves over time. The model is thus non-separable by construction. I assume that a household consists of male mature members, male youth members, female mature members, female youth members, and children. I further assume that male and female members' labor as well as youth and mature members labor are not necessarily substitutes. Hence, there would be labor quality differentials within households across gender and age groups. Similar to Lopez (1984), I am also explicitly considering cases where household members, including youth members, have preferences over working on or off-farm. Households allocate their time endowment (T) among at least four main activities: Leisure (Li), household production (Si), market work (Mi) and farm work (Fi); where subscript i indexes male (m) and female (f) youth members, mature members and children. The time devoted to market work yields a wage, which allows the purchase of market goods (G). The effective real wage for off-farm work, Wi, is assumed to be constant. I further consider that household members jointly choose consumption of home and agricultural produced goods, market goods, and household leisure time.

Time allocated to household production combined with other fixed inputs (denoted here by vector K) yields a household produced a composite commodity (X) described by the production function:

$$X = X(S_{my}, S_{fy}, S_{mm}, S_{fm}, S_c; K) \quad (2.1)$$

$$S = S_{mm} + S_{fy} + S_{mm} + S_{fm} + S_c \quad (2.2)$$

Where my, fy, mm, fm and c denotes male youth household members, female youth household members, male mature household members, female mature household members, and children, respectively.

The household produced commodity X is assumed to be a perfect substitute with the composite agriculture commodity that is either produced by the household or purchased from the market. The

production function for the composite agricultural commodity produced by the household is specified as:

$$\Gamma(F_{my}, F_{fy}, F_{mm}, F_{fm}, F_c, H_{my}, H_{fy}, H_{mm}, H_{fm}, H_c; A) \quad (2.3)$$

Where Γ a concave function; F denotes family labor; H denotes hired labor; subscript i is as defined earlier; A is a vector of fixed factors such as land. Hired labor for the different groups is paid at the corresponding real wage rates W_i^h . In addition, due to transportation or transaction costs, the wage received by family members participating in off-farm may differ from the wages paid out to hired labor (i.e. $W_i \neq W_i^h$). Given this set of information, households are assumed to choose G, S_i, F_i, M_i, H_i to maximise their utility:

$$\text{Max } U(C, L_{my}, L_{fy}, L_{mm}, L_{fm}, L_c; \mathbf{Z}) \quad (2.4)$$

Subject to

$$C = G + X \quad (2.5)$$

$$X = X(S_{my}, S_{fy}, S_{mm}, S_{fm}, S_c; K)^3 \quad (2.6)$$

$$G = \Gamma(F_{my}, F_{fy}, F_{mm}, F_{fm}, F_c, H_{my}, H_{fy}, H_{mm}, H_{fm}, H_c; A) - \sum_{i=1}^5 W_i^h H_i + \sum_{i=1}^5 W_i M_i + \mathbf{I} \quad (2.7)4$$

$$T = L_i + H_i + M_i + F_i \quad (2.8)$$

$$M_i \geq 0 \quad i = \{my, fy, mm, fm, c\} \quad (2.9)$$

Where C is total household consumption; Z is a vector of individuals (groups) or household characteristics influencing preferences; I is real non-labor income (transfers, gifts, remittances, etc) and i is as defined earlier.

Substituting some of the constraints into the utility function specified in Eq. (2.4), the Lagrangean function can be formulated as follows:

$$\begin{aligned} U[G + X(S_{my}, S_{fy}, S_{mm}, S_{fm}, S_c; K), T - S_{my} - M_{my} - F_{my}, T - S_{fy} - M_{fy} - F_{fy}, \\ T - S_{mm} - M_{mm} - F_{mm}, T - S_{fm} - M_{fm} - F_{fm}, T - S_c - M_c - F_c]; \mathbf{Z}] \\ + \lambda \left[\begin{aligned} &\Gamma(F_{my}, F_{fy}, F_{mm}, F_{fm}, F_c, H_{my}, H_{fy}, H_{mm}, H_{fm}, H_c; A) \\ &- \sum_{i=1}^5 W_i^h H_i + \sum_{i=1}^5 W_i M_i + \mathbf{I} - G \end{aligned} \right] + \sum_{i=1}^5 \mu_i M_i \quad (2.10) \end{aligned}$$

³ Can be expressed as $X = X(S_{my}, S_{fy}, S_{mm}, S_{fm}, S_c; K)$ in its long form. The same is true with F_i and H_i .

⁴ $\sum_{i=1}^5 W_i^h = W_{my}^h + W_{fy}^h + W_{mm}^h + W_{fm}^h + W_c^h$ in its long form

Where λ and μ are the lagrangean multipliers associated with the income inequality constraint and inequality constraints on market work of each labor type (i.e. $M_i \geq 0$), respectively.

Maximising the lagrangean with respect to F_i, S_i, H_i, M_i , where $i = my, fm, mm, fm, c$) results the following first order condition⁵:

$$\frac{\partial U}{\partial L_i} = W_i^* = W_i + \mu_i/\lambda \quad (2.11)$$

$$\frac{\partial \Gamma}{\partial H_i} = W_i^h \quad (2.12)$$

$$\frac{\partial \Gamma}{\partial F_i} = W_i^* \quad (2.13)$$

$$\frac{\partial X}{\partial S_i} = W_i^* \quad (2.14)$$

Where W_i^* is a “shadow wage rate” of labor type $i \in \{my, fy, mm, fm, c\}$. Equation (2.11) states that household will equate the marginal rate of substitution between consumption and leisure of family labor type i and the “shadow wage rate”, W_i^* , of labor type i . Equation (2.12) state that hired labor will be utilized until the marginal product of hired labor of each gender and age category is equal to the wage rate paid out to hired labor. Similarly, Equation (2.13) and (2.14) implies that at the optimum, family labor of type i on farm will be utilized up to the point where the marginal productivity on the farm or at home is equal to the respective shadow wage rate. If a person is working in the market then their shadow wage rate will be equal to the respective market wage rate W_i for that gender and age group (i.e. $W_i^* = W_i$), since the complementary slackness condition requires that $\mu_i = 0$ if $M_i > 0$. In contrast, if a person is not working in the labor market, then the shadow wage rate⁶, W_i^* will be in general greater than W_i (Skoufias, 1994) because $\mu_i \geq 0$ if $M_i = 0$. In the latter case (i.e. $M_i = 0$), the optimum will

occur at $\frac{\partial U}{\partial L_i} = W_i^*$, see Eq. (2.11), as indicated above. Under this condition, the market wage rate W

may underestimate the opportunity cost of time of such households. Thus, at the optimum we can redefine the full income of the household as follows:

⁵ I assume that members participate in non-leisure activities to obtain the optimal choices. For details on this I refer the reader to (Skoufias, 1994).

⁶ At the equilibrium point, the shadow wage of farm workers is the marginal product of their labor in farming (Jacoby, 1993).

$$I^* = \max_{h_i F_i} \{ \Gamma(F_{my}, F_{fy}, F_{mm}, F_{fm}, F_c, H_{my}, H_{fy}, H_{mm}, H_{fm}, H_c; A) - \sum_{i=1}^5 W_i^h H_i - \sum_{i=1}^5 W_i^* F_i \} \\ + \max_{S_i} \{ X(S_{my}, S_{fy}, S_{mm}, S_{fm}, S_c; K) - \sum_{i=1}^5 W_i^* S_i \} + I \quad (2.15)$$

Linearizing the budget constraint at the optimum allows one to reformulate the leisure days for each family labor type as the solution to a traditional model of family labor supply. Thus, the equilibrium solution can be expressed as:

$$\text{Max } U[G + X^*, L_{my}, L_{fy}, L_{mm}, L_{fm}, L_c; Z] \quad (2.16)$$

Subject to the constraints

$$G + X^* + \sum_{i=1}^5 W_i^* L_i = I^* + \sum_{i=1}^5 W_i^* T_i \quad i \in \{my, fy, mm, fm, c\} \quad (2.17)$$

The left-hand side of (2.17) is the value of total expenditure on goods and leisure, with X^* denoting the amount of X commodity produced at the optimum; W_i^* , being the shadow value of time defined above. The right hand side of the equation (2.17) is the “shadow full income”.

After some mathematical computation (details of the computation is provided in annex A2.1), the solution to this simpler maximization problem results in the structural demand for leisure and the corresponding structural labor supply functions respectively:

$$L_i^* = L_i(W_{my}^*, W_{fy}^*, W_{mm}^*, W_{mf}^*, W_c^*, I^*; Z) \quad (2.18)$$

$$D_i^* = D_i(W_{my}^*, W_{fy}^*, W_{mm}^*, W_{mf}^*, W_c^*, I^*; Z) \quad (2.19)$$

$$\text{Where } D_i^* = T - L_i = F_i^* + S_i^*; \text{ if } M_i^* = 0 \quad (2.20)$$

$$D_i^* = T - L_i = F_i^* + S_i^* + M_i^*; \text{ if } M_i^* > 0 \quad (2.21)$$

Where D_i^* refers to the total working days for family labor of type i spent on-farm and off-farm (market work) and labor days allocated to the production of the composite commodity X. For simplicity D_i^* refers to total labor days spent on production of crops on-farm and off-farm, aggregated from each parcel and crop at household level for the respective gender and age categories, and I exclude labor days allocated to animal production in the empirical analysis.

In practice, an estimate of shadow wage rate W_i^* could be obtained either from marginal product of each type of family labor in agricultural production or from the marginal product of family labor in the production of commodity X. Since I have collected detailed information on crop production

(disaggregated by age and gender), I estimate the marginal product of family labor from the parameters of the agricultural production. This is particularly useful in estimating the value of time for household members such as youth students and domestic workers who do not sell their labor time. The detailed estimation method is presented in the empirical analysis. Note that the core difference between labor supply derived from this framework and the one derived from the more conventional labor supply model using the observed market wages and full income, is that W_i^* and I^* are endogenous variables since both are correlated with the unobservable characteristics. This is because of the fact that the estimated marginal productivities of each family labor depend on their respective realized days of work causing the causality to run from the hours worked to the estimated wages as well. In order to control for reverse causality in estimation (working days to wage), I estimate the labor supply equation (2.19) using fixed effects instrumental variables (FE-IV), a point I will discuss later with the empirical estimation.

2.3. Data

This study is based on a household and youth panel survey conducted in Oromia region, one of the largest regions in Ethiopia, in woredas selected for Agricultural Growth Program (AGP). Increasing smallholder productivity and value-addition in the agricultural sector are core elements of the Ethiopian government's approach to poverty reduction. The program is a component of this broad effort. The AGP is a five-year program to increase agricultural productivity and market access for key crop and livestock products in agricultural potential areas of Ethiopia with increased participation of women and youth (AGP baseline report, 2011). The program focuses on agricultural productivity growth in four major regions (Oromia, Amhara, SNNP, and Tigray) deemed to possess high agricultural growth potential that can be realized with appropriate interventions. The AGP has two main components: agricultural production and commercialization, and small-scale rural infrastructure development and management. The baseline survey covered 93 woredas (305 enumeration areas) called AGP sites from Oromia, Amhara, SNNP, and Tigray regions. In these woredas, crop production and animal husbandry are the main livelihood means for households. In addition, off-farm employment opportunities play a vital role in the livelihood of households. I built on a baseline study of 926 households from Oromia region that were surveyed in 2010. The base survey was conducted by the collaboration of Central Statistical Authority (CSA) of Ethiopia and Ethiopian Strategic Support Program (ESSP) of the International Food Policy Research Institute (IFPRI) during July 3-22, 2010. AGP participating woredas were selected based on multiple criteria: agricultural potential or productivity, access to market (access to cities of 50,000 population or over in less than 5 hours), natural resource endowment, suitable rainfall and soil for crops and fodder production, potential for development of small-scale irrigation facilities, and institutional plurality of service providers such as cooperatives and farmer groups.

Of the original 926 AGP households in Oromia region, 525 households who have at least one youth member were randomly selected and surveyed again during December 2014 and January 2015. I

purposely selected Oromia region out of the four AGP regions. Of the original 27 AGP woredas in the region, I covered only 12 randomly selected AGP woredas. Due to cost and time-related factors, I predetermined to cover 12 woredas. Each woreda contains 3 enumeration areas (EAs). Thus, 36 enumeration areas spread out among the 12 woredas were covered during the follow-up survey. In each woreda, 78 households were covered during baseline survey. The selection of households for this study were identified using (stratified) multistage random sampling based on the following additional criteria: youth population density, youth migration history, the desired number of respondents, availability of youth members in the household during base survey, and possibilities of tracking migrant youth, and the sample sizes in the fresh list of selected AGP. This study focuses exclusively on households who have either youth members or youth household heads. The AGP baseline slightly oversamples households headed by both young and mature females relative to their share implied by census survey in 2007. Since the original survey was designed with multiple objectives, detailed information on the amount of time allocated per each youth individual per plot was not available. Nevertheless, times allocated per plot for the respective gender and age groups (i.e. disaggregated by gender and farm plot) within the household were available, upon which the second round survey built for the estimation of youth labor supply in agriculture. It was possible to construct a panel data set since AGP baseline collected detail information on labor allocation of household members disaggregated by gender and farm plot.

Following the selection of the 12 woredas, the next step was to determine the survey sample households. Once complete lists of the households in each selected AGP woreda were prepared from the base survey, households without youth members were dropped from the listing. After carefully preparing a fresh list of households with youth household head and youth members [based on AGP baseline data], on average, 44 households per woreda were randomly selected based on probability-proportion-to-size sampling to maintain an equal distribution of sample respondents in each woreda. Put differently, given my interest in youth labor supply in agriculture, determination of sample size and apportionment of the sample households per the 12 selected woredas were based on a proportional sampling technique. One of the main challenges in the process was how to allocate the survey samples across enumeration areas, for which a proportional sampling method was used. Based on the list of names from the baseline survey, the number of households selected was based on $\left(\frac{N}{n}\right)th$, where n denotes the current sample size and N denotes the base year sample size (limited to households with youth members). A complete list of households was used to select the survey respondents.

Once the required samples per the randomly selected woredas were determined, the respective woreda and kebele administrators were consulted to determine the availability of sample households. Reappointment was made if a member of the qualified households were not available at the time of appointment. In cases of unavailability of sample households due to death or difficulty to track for those

who moved, the next household on the contingency list was chosen as a replacement. Youth migrants were identified from the household survey as either youth (siblings) of the household head or youth household members who left the household to work elsewhere (rural, urban) for at least 3 months during the year. In some instances, migrant youth were tracked and interviewed (the success rate was so low, about 20 percent). These were included in the analyses of off-farm labor supply. We have also checked whether attrition resulted from the migration of youth biases my estimation or not. We find that overall the main characteristics (or observables) of migrant youth (i.e. those we were not able to track) are similar in other respects to youth with complete data (i.e. youth who are covered during the second round) (see Appendix Table A2.1). Accordingly, 525 households (202 youth household heads and 323 mature household heads) who have at least one youth member have surveyed again (Table 1). Due to missing key variables (such as income, education) for some households, only 634 youth individuals from 520 households in 36 enumeration areas of Oromia region were used in the analysis.

There is no consensus regarding the age bracket that defines youth. For instance, UN defines youth as persons within the age interval of 15 to 24. The African Youth Charter extends the upper age bracket to 34(thus, defines youth as persons between the ages of 15-35) (UN, 2014). Ethiopia’s National Youth Policy defines youth as persons between the ages of 15-34. Given the Ethiopian rural context, especially children’s contribution to the household income and in line with Ethiopia’s National Youth Policy, in this paper, I define youth over the age interval of 13 to 34. Distribution of households and youth across the sample woredas is presented in Table 2.1. The geographic location of the study sites is presented in Figure 1.1.

Table 2.1: Ethiopian study areas, sample sizes, and distribution across the study areas

Woreda	EAs per woreda	AGP sample	Number of sampled Youth headed households	Number of sampled mature headed households	no of sampled youth members (for household-based analysis of youth labor supply)			no of sampled youth members (for individual-based analysis of youth labor supply)			Average number of youth per sampled household		
					Male	Female	Total	Male	Female	Total	Male	Female	Total
Shirka	3	109	16	37	127	95	212	62	47	109	1.2	0.9	2.0
Agarfa	3	122	21	33	130	108	248	66	56	122	1.2	1.0	2.3
Dugda	3	70	17	15	77	64	141	37	33	70	1.2	1.0	2.2
Guduru	3	109	11	24	105	112	217	52	57	109	1.5	1.6	3.1
Jima Rare	3	132	16	34	130	140	260	64	68	132	1.3	1.4	2.6
Bedele Zuriya	3	108	16	31	122	94	216	59	49	108	1.3	1.0	2.3
Gechi	3	121	18	30	125	115	240	64	57	121	1.3	1.2	2.5
Limu seka	3	95	20	29	98	88	186	50	46	95	1.0	0.9	1.9
Abichugna	3	108	14	31	108	108	216	55	53	108	1.2	1.2	2.4
Weliso	3	75	17	17	82	68	150	42	33	75	1.2	1.0	2.2
Dinsho	3	110	22	26	86	134	221	44	65	110	0.9	1.4	2.3
Dendi	3	61	14	16	60	60	120	30	30	61	1.0	1.0	2.0
Total	36	1217	202	323	1022	1022	2144	695	592	1320	1.2	1.1	2.3

Source: Own computation based on AGP baseline survey

The primary research had three phases: first, focus group discussions to understand the context and to examine how households allocate youth labor and other family members; second, a pre-test of the added questions to the survey modules that were not included during the baseline study; third, the formal survey. Two types of questionnaires were administered to one household: head questionnaire and youth questionnaire. The survey collected detail information on youth characteristics, household

characteristics, wealth, agricultural production such as farms, production inputs including detail labor allocated to each plot and crop for household members (categorized by age, gender, and farm type) and other inputs, outputs, plot tenure, and other farm characteristics and off-farm activities. I aggregated labor hours spent on-farm and off-farm into adult equivalent labor days (AELD)⁷ from each plot and crops at household for the respective age and gender categories. The aggregation method is presented in Annex 3. Community questionnaire to capture community-level characteristics was administered separately. Prior to data collection, enumerators familiar with Computer Assisted Personal Interviewing (CAPI) technique were recruited and provided intensive training. The use of CAPI helps to ensure the quality of my data by preventing measurement error, maintaining consistency, and avoiding missing data.

2.4. Descriptive statistics

In this section, I provide the descriptive statistics for main variables of interest. Table 2.2 provides basic overview statistics of the youth and household in the sample. As expected, my sample contains more male youth than female. I found that 66% of youth in my sample who live with their parents at the time of baseline study has decreased to 62%. Migration and marriage are the two main reasons for this change. On average, youth in my sample have completed three years of education at the time of baseline study. The average years of education of the youth in my sample at the time of second-round survey were four. The average number of youth per household was about two.

Table 2.2. Main characteristics of youth and household head

	2011	2015
Youth characteristics		
Male youth (%)	61.02	59.05
Female youth (%)	38.98	40.95
Youth household headed (%)	34.25	38.48
Live with parents (%)	65.75	61.52
Average education of the youth (years)	2.54	3.78
Average number of youth per household	2.39	2.23
Household head characteristics		
Average education of the household head (years)	1.63	1.92
Household head is male (%)	72.44	69.90
Household head is female (%)	27.56	30.10

Source: survey results

As indicated in Table 2.3 trends and patterns of youth participation in agriculture vary by gender. For instance, 63% of male youth members' main occupation was farming (full-time farmer either on own-

⁷ One AELD represents 8 hours. An adult equivalent labor day equals the amount of labor an adult male spent during a working day. Adult equivalent labor days were obtained as a weighted sum of labor days reported for adult males (weight=1), adult females (weight=0.84) and children below the age of 14 (weight=0.48). It is important to note as a caveat that the labor days reported by respondents were not necessarily equal to full working days in every case. It is also unlikely that these days were identical across crops and/or activities. Labor allocation for the respective gender and age groups for the respective household was obtained at plot level in working days and later converted to adult equivalent labor days (AELD) at household level. Information on household members' labor utilization per plot per crop was collected for the main agricultural production season (meher season) and only for crop production. It was then aggregated into total AELD per household per farm type (on-farm and off-farm) for the respective gender and age group. The exclusion of household labor utilization during the Belg season (short rainy season) may underestimate the total supply of labor.

farm or family farm) in 2010; while it was about 39% for female youth members. The main occupation refers to the main activities of the youth. In 2015, about 68% and 42% of male and female youth members' reported full-time farming on either their own or family farm as their main occupation, respectively.

Table 2.3. Summary of the main occupation as reported by the youth

Main occupation	2010			2015		
	Male youth (%)	Female youth (%)	All youth (%)	Male youth (%)	Female youth (%)	All youth (%)
Full-time farming	63.34	38.77	54.46	68.58	42.73	58.42
Off-farm	1.5	3.08	2.07	4.24	11.45	6.53
Student	35.16	58.15	43.47	27.18	45.81	35.02

Source: survey results. Note: full-time farming refers to farm work on either own or family farm.

On average, 2014/15 on-farm labor supply for both male and female youth members is declining compared to 2010/11 agricultural season; whereas off-farm labor supply is increasing for both. In 2010/11 Meher⁸ season, the average labor days (in AELD) used on on-farm for all crops cultivated for male and female youth members at household level were 57 and 20 labor days (in AELD), respectively. In 2014/15, these figures have decreased to 52 and 15 labor days for male and female youth members, respectively. In 2010/11 Meher season, on average, a household utilized about 6.93 labor days (in AELD) which were contributed by male youth members and 6.24 labor days contributed by female youth members in off-farm⁹ activities. However, in 2014/15 Meher season, the average household level labor supplied to off-farm for male and female youth members have increased to 10.39 and 7.01, respectively (Table 2.4). Whilst there is an increasing trend in total labor supply (which is the sum of labor days supplied to on-farm and off-farm during Meher season by male youth, female youth, male mature, female mature and children) at household level, there is a decreasing trend in labor demand (the sum of labor used on the farm in AELD including hired labor).

Table 2.4: Average youth members and household labor supply and demand per hectare (in adult equivalent labor days-AELD) for main agricultural season

Year	Male youth members Contribution per household		Female youth members contribution per household		Household	
	On-farm	Off-farm	On-farm	Off-farm	Total demand	Total supply
2010/11	69.88	6.93	20.31	6.24	95.92 (102)	109.67
2014/15	63.98	10.39	15.28	7.01	94.62	112.41
Total	65.60	8.66	16.91	6.77	95.26	111.07
Mean diff	-5.24	3.46	-5.03	0.77	-1.29	3.74
P-value	0.25	0.13	0.05	0.51	0.41	0.34
N	1159	1159	1022	1022	1022	1022

Source: Survey results

⁸ Meher season is the main agricultural season linked to long rainy season from May to January. It accounts for about 90-95% of the annual crop production of Ethiopia.

⁹ off-farm in this context includes off-farm farming employment, business and other income generating activities

Note: Total household labor is the sum of on-farm and off-farm labor supply of all household members per household. The null hypothesis is that the mean difference between the two years agricultural seasons is zero, i.e. Diff = mean (2014) - mean (2011) =0.

The summary of reports regarding youth intentions to engage in agriculture during a base survey in comparison to their realized engagement after five years is presented in Table 5. In 2010/11 (at the time of base survey), youth were asked about their career intentions/plan, given their current occupation. After five years, they were asked again their realized occupation. As one can see from Table 5, only 32% of youth respondents during base survey had been considering agriculture employment as their intended occupation. Contrary to their intentions, however, a significantly higher percent (51%) of them have ended working in agriculture in 2014/15. This means that significant number of youth were not able to find employment outside agriculture 26 % of survey respondents had planned to work in off-farm by 2014/15, only 14% of them fail to work in line with their preferences. In 2014/15, the respondents were asked again about their future occupation preferences. About 28% of the youth sampled are considering agriculture as their future occupation. It is also interesting to note that in 2010/11, 12% of youth respondents' main occupation was off-farm (such as farm wage employment, businesses, and other non-farm income generating activities). The intention to work in off-farm activities is somehow, in line with the realized engagement, however, there is still a mismatch between youth intention and realized engagement. These suggest that youth intentions and realized engagement vary greatly. Thus, some studies who have found evidence that youth are abandoning agriculture (based on intentions than using realized engagement as outcome variable) would be misleading and result in methodological flaws. I find less discrepancy between youth's intention to study and realized enrolment. It is also interesting to note that youngsters who are currently working (who were dropouts) are planning to go back to school (reflected by the higher number of youngsters with future intentions to study are greater than the number of current students) (Table 2.5, row 3).

Table 2.5. Youth livelihood occupation: realized engagement and intentions

Category	Livelihood occupation (%)											
	During base survey						During follow-up survey					
	Main occupation (realized engagement): 2010/11			Intended/planned occupation: 2010/11-2014/15			Main occupation realised (realized engagement): 2014/15			Future occupation (intended/planned occupation) from 2015-2020		
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Farming	43	23	43	42	20	32	62	37	51	35	18	28
Student / further study	33	56	42	35	56	42	28	46	35	34	59	42
Off-farm	8	16	12	21	20	26	10	17	14	31	23	30

Source: Survey results

Note: off-farm in this context includes off-farm farming employment, business, and other income-generating activities. The sum of the percentage figures may not add 100 as the percentage figures exclude unemployed youth and those who said don't know.

Different factors have contributed to the mismatch between what was planned and realized and part of the underlying factors has resulted in increased participation of youth in agriculture. These include demand for family labor (60%), the absence of other viable means of livelihood in the areas (19%) and

profitability of agriculture (12%). Summary of variables used in the estimation of agricultural production function is presented in Table 2.6.

Table 2.6: Definition, Mean and standard deviation of other variables used in the estimation of the agricultural production: main agricultural season

Variable	Variable descriptions	2010/11		2014/15	
		Mean	Standard deviation	Mean	Standard deviation
Totoutput	Total output value in 2011 prices-crop only	10812.89	24909.85	13431.54	24650.95
MYL	Total working days of family labor contributed by male youth members (in AELD)	69.05	58.19	63.04	84.75
FYL	Total working days of family labor contributed by female youth members (in AELD)	21.31	31.73	20.28	28.34
AML	Total working days of mature family labor contributed by male members (in AELD)	50.06	43.25	26.98	39.44
AFL	Total working days of mature family labor contributed by female members (in AELD)	16.17	16.43	19.72	25.78
CL	Total working days of family child labor (in AELD)	5.82	12.62	6.44	12.64
THHL	Total working days contributed by all members of the household in AELD (MYL+FYL+AML+AFL+ CL)	114.38	101.26	106.96	126.55
HL	Total hired labor days	6.06	20.94	14.37	78.75
OXEN	Total oxen owned (TLU)	1.78	2.49	2.18	2.62
Mechanization	Value of agricultural production tools to capture mechanization(in birr)	5363	3849	7518	5420
AREA	Total cropped areas in hectares	2.08	3.18	1.66	2.165
SEEDVAL	Value of seeds (2010/11 birr)	277.00	734.37	309.59	834.31
FERRVAL	Value of fertilizer (2011 birr)	740.96	1164.15	802.84	1344.83
WEEDVAL	Value of seeds	46.55	193.411	53.49	220.80
Extension	Frequency of extension visits	0.88	1.88	0.86	1.87
Expert	Frequency of expert visit per crop calendar	1.79	0.40	1.80	0.39
Age_head	Age of household head in years	41.71	15.18	43.09	15.30
Sex_head	Sex of head of the household (1=male; 2=female)	1.27	0.44	1.30	0.45
Educ_head	Education of the household head in completed years	1.63	2.67	1.96	2.94
Age_youth	Average age of the youth in completed years	19.37	6.63	22.22	6.07
Educ_youth	Average education of youth in completed years	2.51	2.58	3.86	3.24
Number of households		521		511	

Source: Survey results. Note: All value variables such as asset values and others are deflated to 2011 prices. Mechanization in this context includes agricultural assets or farm implements plough beam, plough metal, chemical sprayers, motorized pumps, handheld, small tractors and the like that are assumed to affect labor productivity links.

2.5. Empirical analysis

Most agricultural labor studies in developing countries rarely analyze the agricultural labor supply disaggregated by gender and age group. To estimate labor supply of youth members in agricultural households, my empirical estimation strategy relies on the use of shadow wages. The use of shadow wages accounts for simultaneity between production and consumption decision of the households and widespread labor market failure. Following Jacoby (1993), Skoufias (1994), and Chang (2012), the estimation of youth labor supply consists of three main steps.

First, I obtain the estimates of the marginal productivities of the different family labor¹⁰ (male youth, female youth, male mature, female mature, and children) and hired labor estimated from a Cobb-Douglas (C-D) production function specified as heterogeneous inputs. The C-D production function is widely used in developing countries mainly because of its simplicity to interpret and compute the parameters of interest. However, C-D production function has limitations in the functional specification; simplest assumption of homogeneity, sensitivity to the choice of inputs and it restricts that marginal rate of technical substitution depends only on the ratios of labor inputs and not on other inputs. Consequently, C-D production function assumes substitution is between labors only. However, in reality, farming machines may substitute labor; hence, I need to use interactions such as labor with farm implements.

To complement my findings, I replicated the analysis using the more flexible functional form of a production function such as the translog. The use of translog helps to overcome these inherent limitations of C-D production function but it's difficult to estimate. Both production functions require intensive data and computation. Since neither measure is perfect, I adopted also Kien (2008) approach of estimating shadow wages and shadow income, which does not require the estimation of production function (see Kien, 2008 for the details). Kien (2008) proposed an alternative approach to estimate the shadow wage based on the observation that the shadow wage is the marginal product of labor at the optimal point of both farm and household production functions without estimating the production function for the analysis of agricultural labor supply regardless of market failures. He suggested the use of expected output instead of estimating the predicted output from the production function. Advantages of his approach includes less data requirement requires no assumption on the functional form and reduces errors from estimating the production function that will contaminate shadow wage. It should be noted, however, that the two approaches to the estimation of shadow wages are based on developing a time allocation model and the key observations come from the fact that the shadow wage is the value of the marginal product of labor at the optimal point on the production function curve. The estimation results from translog and Kien approach are available upon request.

Multiple crop outputs are aggregated into a single output measure using the medians of their reported prices within each village. I considered only crop output and did not include livestock products such as the sales of dairy, skins, and hides, and other animal products. I checked the robustness of my results by including these output values for which the data was reported and found similar conclusions. I included draught animal as an input into the production of crops.

I specify the C-D production function as:

¹⁰ The labor working days are collected at plot level, but aggregated to household level

$$\ln Y_{(h,t)} = \sum_{j=1}^5 \beta_j \ln X_j(ht) + \beta_6 \ln(K_{ht}) + \beta_7 \ln(F_{ht}) + X_{it}\theta + \mu(h) + \tau(t) + \varepsilon(h,t) \quad (2.22)$$

Where $\ln Y_{(h,t)}$ denotes the total value of agricultural crops produced by farmer h in year t; β_j 's are parameters to be estimated (the marginal productivity of labor category j), $X_j(h,t)$ is the total quantity of labor input used and/or contributed by members (youth, mature and children disaggregated by gender) in household h in year t; K_{ht} is the value of other variable input¹¹ used by in household h in year t; F_{ht} is set of fixed inputs used by household h in year t; X_{it} is a vector of household and youth observable characteristics in year t and $\mu(h, k)$ is household fixed effect that captures the time invariant household-specific heterogeneity that can arise from the omission of some key variables such as household managerial or soil characteristics;; $\tau(t, k)$ is a year effect common to all households such as rainfall and the last term $\varepsilon(h,t)$ is a random disturbance term. All variables measured in monetary terms such as output, seed and other inputs are deflated to 2011 prices. I use both the fixed effects and random effects specification for comparison. District-level fixed effects are applied to all estimations in order to account for the factors of this nature that are invariant within districts and that could bear influence on gendered productivity levels. Standard errors are clustered at household level in order to account for correlation individuals situated in the same household.

Second, based on the coefficients estimated from equation (22), the shadow wage rates for male and female youth members' labor days in household h in year t are derived using the following expressions:

$$\widehat{W}_{my}^*(h, t) = \frac{\widehat{Y}_{(h,t)}}{\widehat{MYL}_{(h,t)}} \widehat{\beta}_{MYL} \quad \text{and} \quad (2.23)$$

$$\widehat{W}_{fy}^*(h, t) = \frac{\widehat{Y}_{(h,t)}}{\widehat{FYL}_{(h,t)}} \widehat{\beta}_{FYL} \quad (2.24)$$

Where \widehat{W}_{my}^* & \widehat{W}_{fy}^* are shadow wages for male and female youth members, respectively; $\widehat{Y}_{(h,t)}$ denotes the fitted value of output for household h in year t; MYL is total working days of family labor contributed by male youth members in year t; FYL total working days of family labor contributed by female youth members in year t; \widehat{W}_{my}^* & \widehat{W}_{fy}^* are shadow wages for male and female youth members derived from the estimated coefficients of $\widehat{\beta}_j$ referred in equation (2.22) above (it refers to the marginal productivity of labor); subscripts my and fy denote male and female youth members in household h in year t, respectively .

Similarly, the shadow wage rates for male and female mature members' labor days in the household h in year t are derived as follows:

¹¹ In general inputs include fixed inputs such as land and variable inputs such as labor disaggregated by age category and gender, fertilizer, improved seeds, local seeds, irrigation, extension services and oxen draught.

$$\widehat{W}_{mm}^*(h, t) = \frac{\widehat{Y}_{(h,t)}}{\widehat{AML}(h,t)} \widehat{\beta}_{AML} \quad \text{and} \quad (2.25)$$

$$\widehat{W}_{fm}^*(h, t) = \frac{\widehat{Y}_{(h,t)}}{\widehat{AFL}(h,t)} \widehat{\beta}_{AFL} \quad (2.26)$$

Where mm and fm denotes male and female mature members in the household h, respectively; AML is the total labor for male mature members' (excluding male youth labor) and AFL is total labor for female mature members' (excluding female youth labor); the rest as defined earlier.

Once I estimate the shadow wages, the next step is the estimation of shadow income $\widehat{I}(h, t)$ of the household, h to which the youth belong. This can be derived from the expression:

$$\begin{aligned} \widehat{I}(h, t) = & \widehat{Y}_{(h,t)} - \widehat{W}_{my}^*(h, t) * MYL(h, t) - \widehat{W}_{fy}^*(h, t) * FYL(h, t) - \widehat{W}_{mm}^*(h, t) * MML(h, t) - \widehat{W}_{fm}^*(h, t) * \\ & MFL(h, t) - W_{my}(h, t) * HMYL(h, t) - W_{fy}(h, t) * HFYL(h, t) - W_{mm}(h, t) * HAML(h, t) - W_{fm}(h, t) * \\ & HFYL(h, t) - W_{ox}(h, t) * OXEN(h, t) - SEEDVAL(h, t) - OTHERINP(ht) + \Pi p(h, t) + V(h, t) \quad (2.27) \end{aligned}$$

Where W_{my} , W_{mm} , W_{fy} , W_{fm} , W_{ox} are the village level average wage rates for male youth, male mature, female youth, and female mature and oxen labor services, for household h, in time t, respectively. $\Pi p(h, t)$ is the sum of net returns from the sale of livestock products, livestock sales and off-farm income, and $V(h, t)$ is income from land rent, oxen rent, handicrafts, business (trade), and transfers received by household h in year t.

The third stage of estimation¹² is the estimation of male and female youth members' labor supply, i.e. total working (labor days) in AELD used on-farm and off-farm are regressed on the shadow wage rates and shadow income. In other words, the shadow wages and shadow income in step two are inserted into labor supply for estimation. I aggregated working days spent on each plot for crop production [agricultural activities] for the respective male youth, female youth, male mature, female mature and children of farm household-to-household level. Since my focus is on the trend and analysis of factors affecting youth labor supply, these aggregations may not necessarily affect the core objective of our analysis. I matched these working days (aggregated per sex and per age group per household) with shadow wages and income estimated in the second stage of the analysis together with youth and household head demographic, asset information and other variables. Excluding some observations for which some data is missing, I end up with a total of 1015 observations on male youth members, and 1011 observations on female youth's members for the estimation at the household level.

¹² Though my interest is the participation of youth in agriculture, I excluded labor allocated to animal production, domestic and non-farm labor allocations from the sample in labor supply estimation because of absence of data. Hence, my data is limited to crop production

In computing our measure of youth labor supply in agriculture, I generally categorized time spent into on-farm, off-farm, and total (which is the sum of both on-farm and off-farm labor supply). In 2010/11 agricultural season, it was reported that 23% of households have experienced participation in off-farm wage employment either through the head, spouse or youth members, and this figure has increased to 28% in 2014/15 agricultural season. In terms of the off-farm participation of male youth members, 8% and 10% of them have engaged in off-farm employment in 2010/11 and 2014/15 agricultural seasons, respectively. In 2010/11 and 2014/15 agricultural seasons, off-farm participation for female youth members of farm household were 16% and 17%, respectively.

The empirical representations of equation (2.19) for male and female youth members of farm household h in year t are specified in log-linear form as follows¹³:

$$\ln D_{my}^*(ht) = \gamma_{my0} + \gamma_{my} \ln \widehat{W}_{my}^*(h, t) + \gamma_{mfy} \ln \widehat{W}_{fy}^*(h, t) + \gamma_{mmm} \ln \widehat{W}_{mm}^*(h, t) + \gamma_{mfm} \ln \widehat{W}_{fm}^*(h, t) + \gamma_{myl} \ln \widehat{I}(h, t) + \delta_{my} T + \gamma_{myx} Z(h, t) + \mu_i + \mu_{it} + \epsilon_{my}(h, t) \quad (2.28)$$

$$\ln D_{fy}^*(ht) = \gamma_{fy0} + \gamma_{fy} \ln \widehat{W}_{fy}^*(h, t) + \gamma_{fmy} \ln \widehat{W}_{my}^*(h, t) + \gamma_{fmm} \ln \widehat{W}_{mm}^*(h, t) + \gamma_{ffm} \ln \widehat{W}_{fm}^*(h, t) + \gamma_{fyl} \ln \widehat{I}(h, t) + \delta_{fy} T + \gamma_{fyx} Z(j, h, t) + \mu_i + \mu_{it} + \epsilon_{fy}(h, t) \quad (2.29)$$

where the γ 's and δ are parameters to be estimated, $D^*(ht)$, $\widehat{W}_{my}^*(h, t)$, $\widehat{W}_{fy}^*(h, t)$, $\widehat{W}_{mm}^*(h, t)$, $\widehat{W}_{mf}^*(h, t)$ and $\widehat{I}(h, t)$ are as described above, $Z(h, t)$ denotes a vector of youth/individual and household specific observable characteristics in household h in year t presented in Table 6; μ_i is the standard time invariant unobserved characteristics, (μ_{it}) is unobserved time variant and $\epsilon_i(h, t)$ is error term representing unobservable factors. The coefficient (δ_i) of year dummy (T) is one of our interests as it indicates trend. For individual estimation, the outcome variables in the labor supply model are the average working days per the respective gender for the different labor categories.

The coefficients of the shadow wage provide estimates of own wage elasticities and cross-wage elasticities, whereas the coefficients of the shadow income provide the estimates of income elasticities for the respective gender category. Since, the shadow wage and shadow income depend on on-farm labor (F_i) which is part of the labor supply (D_i) they will be, therefore, endogenous. As Murtazashvili and Wooldridge (2008) suggested, when endogenous explanatory variables are continuous and when I have endogeneity that arises from both time-invariant unobservable characteristics (μ_i) and time variant unobservables (μ_{it}), the better way to estimate the parameters is to use the fixed effects instrumental variables (FE-IV) estimators. This sweep away individual specific time trends and enables us to control for the simultaneity between labor supply, and shadow wages and income. The relevant variables I used as instruments in shadow wage and income are discussed in the results section. To control for within

¹³ If the shadow income is negative, a value of 1 is assigned so that the observations will not be lost after talking logs. In doing so, 146 observations out of 1051 observations on I were negative.

correlation, I use cluster-robust covariance. Table 2.7 summarizes the statistics of the variables used in the estimation of the labor supply functions. In the next sections, I present the results of the regression models described earlier.

Table 2.7. Definition and descriptive variables used in the estimation of labor supply

Variable name	Description of key variables used in labor supply models	2010/11		2014/15	
		Mean	Standard deviation	Mean	Standard deviation
\hat{I}	Shadow income estimated for the household	4,708	5,743	6,760	8,872
W_{my}	Shadow wage estimated for male youth members	8.268	8.761	21.61	40.67
W_{fy}	Shadow wage estimated for female youth members	20.764	25.14	40.804	24.32
W_{mm}	Shadow wage estimated for male mature members	7.134	6.556	24.86	25.91
W_{fm}	Shadow wage estimated for female mature members	26.38	31.86	34.00	33.54
W_m	Market wage earned by male youth	16.82	4.041	39.27	12.73
W_f	Market wage earned by female youth	14.09	3.085	20.95	16.36
ToT_On	Total on-farm family labor days(AELD)	114.38	101.26	106.96	102.5
off_MYL_ha	Total off-farm male youth labor days(AELD)	6.73	54.12	10.70	101.38
off_MFL_ha	Total off-farm female youth labor days(AELD)	6.42	43.44	7.01	51.23
ToT_Off	Total off-farm labor days (in AELD)	11.17	36.51		28.37
ToT_Lss	Total supply of household labor (in AELD)	130.5	99.04	119.6	125.8
MYL	Total male youth members labor contribution (AELD, on-farm)	57.10	58.57	52.38	84.78
FYL	Total female youth members labor contribution (AELD, on-farm)	20.69	31.17	16.71	27.77
MML	Total male mature members labor days (in AELD, on-farm)	30.58	43.35	23.40	39.45
MFL	Total female mature labor days (in AELD, on-farm)	10.55	16.39	17.04	25.68
CHL	Child labor (in AELD, on-farm)	5.759	14.05	5.249	11.21
THL	Total hired labor days (in AELD)	6.130	21.02	14.43	78.91
Farm_Dist	Farm distance from the household home(in minutes)	0.207	0.295	0.198	0.283
Children_tot	# of children under 14 years	1.427	1.122	1.362	1.159
Student_m	# of male student youth 13-34 years	0.733	0.942	0.703	0.925
Student_f	# of female student youth 13-34 years	0.702	0.932	0.717	0.922
Full_timeyou_m	# of full-time male youth 13-34 years	0.722	0.701	0.730	0.716
Full_timeyou_f	# of full-time female youth 13-34 years	0.310	0.548	0.262	0.482
TLU	Number of livestock owned in TLU	8.204	8.530	8.523	8.733
Educ_male	Average education of male youth (years)	2.844	2.976	2.895	3.061
Age_male	Average age of male youth members (years)	17.60	9.893	17.99	10.01
Educ_female	Average education of female youth members (years)	2.558	3.279	2.365	3.008
Age_female	Average age of female youth members (years)	18.12	9.403	19.16	9.026
Headtype	Head type(1=youth headed, 0 otherwise)	0.34		0.39	
Land_quality	Land quality (1=Teuf, 2=lem-teuf, 3=lem)	2.441	0.673	2.347	0.733
Durables	Total durable and consumable asset values(in 2011 ETB)	5,385	38,571	7,577	66,499
Sex_head	Sex of household head (1=female, 0 otherwise)	0.28		0.30	
Educ_head	Education of the household head(years)	1.640	2.66	1.94	2.9
Marit_head	Marital status of the household head(1=married, 0 otherwise)	0.72	0.44	0.71	0.45
Assetprod	Value of assets for agricultural production (in 2011 prices)	5,363	3849	7518	5420
Youth_male	# of male youth in the household 13-34 years	1.22		1.15	
Youth_female	# of female youth in the household 13-34 years	1.17		1.08	
Mature_male	# of male mature in the household >35 years	1.0		0.86	
Mature_fem	# of female mature in the household >35 years	0.70		0.54	
	Number of observations(households)	511		506	

Source: Survey results

2.6. Results and discussions

Table 2.8 presents the OLS, random-effects (RE) and fixed-effects (FE) estimates of the coefficients of the production technology specified in equation (22). The Hausman test of the random versus fixed-effects specification fails to reject the random-effects specification at the 5% significance level. However, I use also fixed-effects for comparison as it controls for the correlation of the unobservable farmer-specific effects with the observed inputs. The use of random effects estimates indicate that use of family labors such as male youth, female youth, male matures, female matures and child labor have larger significant effects on output than the use of hired labors. In addition, the results of both FE and RE estimates indicate that the use of family male youth members seem to have a bigger effect on output compared to family female youth members, though care should be taken in interpreting the results as I pooled the resources of the household in estimating the labor productivities of family members. I also note that the use of family female mature members has higher effects on output compared to other family members. Furthermore, the RE estimates show that child labor has a positive and significant effect on output, suggesting the economic contribution of child labor in the production of crops.

There are mainly three issues in investigating labor supply- the need to control for sample selection bias, unobserved heterogeneity, and endogeneity of shadow wages and shadow income. Selection process driving the decision to work, and where to work is only observable for the youth who are only present in the off-farm employment. Use of OLS under such condition results in biased estimates. Our panel data make it possible to correct for selection bias and as well as unobservable heterogeneity. Nijman and Verbeek (1992) propose simple tests for sample selection in the presence of panel data: to include variables measuring whether the individual is observed in the previous period (P1), the individual is observed in both period (P2) and a total number of periods the individual is observed (P3). The null hypothesis is that P1, P2, P3 should not be significant in our model if there is selection problem. Accordingly, the results rejected the null for the off-farm labor equations for both male and female youth labor. The Hausman type test also fails to reject the null for on-farm models for both groups while it rejected the null hypothesis of no selection problem for the off-farm models. Following Kyriazidou (1997) method, I estimated the selection equation to get consistent estimates.

Table 2.8: Cobb-Douglass agricultural production function: OLS, FE and RE estimates

Variables	Dependent variable: Log(total value of output)		
	(1) OLS	(2) Fixed Effects	(3) Random Effects
Sex_head	-0.168* (0.0925)	- -	-0.1518* 0.0935
Age_head	0.0215* (0.0120)	0.0254 (0.0200)	0.0234** (0.0116)
Age_head (squared)	-0.0002* (0.0002)	-0.0002 (0.0002)	-0.0002* (0.0002)
Educ_head	0.0018 (0.0130)	-0.0088 (0.0352)	0.0016 (0.0120)
Marit_head	0.0671 (0.0707)	- -	(0.0352) 0.0316
Log(MYL)	0.0590*** (0.0224)	0.0463* (0.0214)	0.0579*** (0.0224)
Log(FYL)	0.00786 (0.0370)	0.0234 (0.0482)**	0.00740 (0.0383)*
Log(MML)	0.0333 (0.0285)	0.0284 (0.0325)	0.0214* (0.0302)
Log(MFL)	0.0693** (0.0271)	0.0661** (0.0306)	0.0653** (0.0260)
Log(CHL)	0.0441 (0.0271)	0.0382 (0.108)	0.0492* (0.0281)
Log(HL)	0.0256 (0.0242)	0.0119 (0.0314)	0.0239 (0.0241)
Log(OXEN)	0.254*** (0.0456)	0.173** (0.0734)	0.254*** (0.0459)
Mechanization	0.0937*** (0.0302)	0.0883*** (0.0270)	0.0883*** (0.0270)
Log(land)	0.446*** (0.0736)	0.347*** (0.0740)	0.432*** (0.0698)
Log(FERRVAL)	0.0356*** (0.0109)	-0.0286 (0.0303)	0.0335*** (0.0110)
Log(SEEDVAL)	-0.0034 (0.0115)	-0.146 (0.732)	-0.0032 (0.0116)
Log(WEEDVAL)	-0.0745*** (0.0180)	-0.0591 (0.757)	-0.0762*** (0.0182)
Educ_male	-0.0057 (0.0126)	-0.0131 (0.0221)	-0.0058 (0.0129)
Age_male	0.0045 (0.0045)	0.0041 (0.0075)	0.0050 (0.0048)
Educ_female	-0.00342 (0.0098)	-0.0030 (0.0161)	-0.0038 (0.0097)
Age_female	-0.0028 (0.0032)	-0.0104* (0.0055)	-0.0035 (0.0032)
Much_RAIN	-0.209***	-0.0770	-0.1812**
Constant	6.517*** (0.342)	8.106 (6.300)	6.523*** (0.340)
Observations	1,022	1,022	1,022
Household FE	-	YES	YES
Year FE	Yes	Yes	Yes
R-squared	0.46	0.20	0.46
Fixed vs Random Hausman	Prob>chi2	=	0.2378

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Survey results

Note: other regressors used in the model includes woreda dummies, shock dummies such as input prices, output prices, pests, livestock diseases, household production shifters which include total number of children in the household, total number of male and female youth members and total number of mature male and female members, farm tools (mechanization), land certificate, plot characteristics-slope, soil quality, farm distance from residence place. Given the

presence of zero values in some inputs, the logarithmic transformation was carried out by adding one to all input levels (i.e., $\ln X_i = \ln (X_i + 1)$)¹⁴. This is a common practice in literature to keep the estimation manageable and under such condition the use of CD production function is plausible (McCurdy and Pencavel, 1986; Jacoby, 1993); hence the labor supply estimates will be robust to the choice of constant. For example, some households have only male or female youth labor; labor is hired by about 30 percent of the households, and about 35 and 40 percent of the households do not use any chemical fertilizer and improved seed, respectively. Fifty-nine percent of households report zero labor inputs for child labor.

To control for individual heterogeneity, sample selection, and instrumenting for possible endogeneity of shadow wages and shadow income, I estimated the labor supply functions in equations 28 and 29 using the fixed effects and fixed effects instrumental variables (FE-IV) methods. FE-IV involves two-stage regressions. First, shadow wage rates and shadow income for the different gender and age groups are regressed on the complete set of instruments presented below. Using the predicted values from these first stage regressions as regressors, I estimated the labor supply functions by using fixed effects. I also estimated the models using OLS but not reported here. In this estimation, as discussed earlier, I assume that all youth farm labors are of equal quality within the same sex and the same age category but different between sexes and age categories.

Based on the random-effects estimates in column (3) of Table 2.8 used to derive the shadow wage rates of male and female youth members' (using the expressions in equations (2.25) to (2.27)), the effect of shadow wages and shadow income on the different types of youth labor supply is presented in Table 2.9. Most of our discussion will concentrate on the estimated effects of shadow wages and incomes (mainly the results of FE estimates) on the labor supply of youth members. The first column, third, fifth, seventh, ninth and eleventh reports the FE estimates of male and female youth members on-farm and off-farm labor supply, while the results from the IV counterpart of this model (FE-IV) is given in column two, column four, column six, column eight, column ten and column twelve.

¹⁴ As to other inputs, such as fertilizer, the baseline study show that mature headed and male headed households applied more fertilizer compared to youth and female headed households (up to 10% more fertilizer). Though the utilization of improved seeds is low among households (about 40%), the application rate of improved seeds among users was significantly large (about 17.5 kg/ha). Slightly households with mature heads applied more improved seeds. As to irrigation and soil conservation measures, male heads and mature households used irrigation and soil conservation measures more than their counterparts. Interestingly, young heads were visited more by an extension agent than mature household heads.

Table 2.9: Determinants of on-farm and off-farm male and female youth members' labor supply (FE and FE-IV estimation result): at household level

Variables	(Dependent variable: Log (total working days of male or female members')											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	On-farm				Off-farm				Total			
	Male FE	Male FE-IV	Female FE	Female FE-IV	Male FE	Male FE-IV	Female FE	Female FE-IV	Male FE	Male FE-IV	Female FE	Female FE-IV
$\ln(\widehat{W}_{my})$	0.399*** (0.0666)	1.639*** (0.0740)	-0.0850* (0.0451)	0.0737 (0.0634)	0.105** (0.0469)	0.147** (0.0703)	-0.0266 (0.0427)	-0.0760 (0.0835)	0.404*** (0.0669)	1.575*** (0.0784)	-0.122*** (0.0450)	-0.0295 (0.0699)
$\ln(\widehat{W}_{fy})$	-0.208*** (0.0564)	0.133 (0.109)	-0.293*** (0.0595)	1.535*** (0.105)	0.0178 (0.0487)	-0.00685 (0.133)	0.0503 (0.0477)	0.237** (0.107)	-0.211*** (0.0566)	0.0573 (0.111)	-0.264*** (0.0585)	1.162*** (0.110)
$\ln(\widehat{W}_{mm})$	-0.227*** (0.0519)	-0.921*** (0.158)	-0.0195 (0.0453)	-0.714*** (0.154)	0.0283 (0.0452)	-0.0184 (0.166)	0.0341 (0.0413)	-0.118 (0.143)	-0.208*** (0.0515)	-0.840*** (0.159)	0.0188 (0.0461)	-0.502*** (0.165)
$\ln(\widehat{W}_{fm})$	0.133*** (0.0422)	0.927*** (0.236)	0.0310 (0.0400)	0.527** (0.227)	0.0273 (0.0399)	-0.190 (0.265)	0.0366 (0.0424)	-0.144 (0.216)	0.130*** (0.0429)	0.836*** (0.248)	0.0269 (0.0430)	0.450* (0.239)
$\ln(\widehat{W}_{ch})$	-0.0925* (0.0550)	-0.136 (0.111)	-0.0170 (0.0591)	0.149 (0.109)	-0.0674 (0.0634)	-0.273* (0.144)	-0.00835 (0.0565)	-0.0394 (0.135)	-0.110* (0.0568)	-0.165 (0.121)	-0.00525 (0.0567)	0.00749 (0.122)
$\ln(\widehat{I})$	-0.0436 (0.0294)	-0.129 (0.0896)	-0.0158 (0.0220)	-0.0915 (0.0980)	0.0198 (0.0267)	0.132 (0.125)	0.0639** (0.0265)	0.256** (0.125)	-0.0415 (0.0306)	-0.0828 (0.0956)	0.00165 (0.0222)	0.0656 (0.105)
Trend	-0.0676 (0.127)	-0.226* (0.117)	0.0175 (0.120)	-0.0579 (0.127)	0.0283 (0.117)	0.160 (0.153)	-0.104 (0.104)	0.101 (0.144)	-0.0310 (0.126)	-0.175 (0.129)	-0.0761 (0.119)	-0.175 (0.137)
Educ_male	0.0375 (0.0864)	0.0339 (0.0595)	0.0553 (0.0739)	0.0983 (0.0598)	-0.0913 (0.0697)	-0.101 (0.0693)	-0.0503 (0.0666)	-0.0600 (0.0679)	-0.0206 (0.0877)	-0.0258 (0.0658)	-0.0351 (0.0743)	-0.00406 (0.0672)
(Edu_male)2	-0.0003 -0.0090	-0.0032 -0.0066	-0.0089 -0.0066	-0.0129** -0.0054	0.0080 -0.0076	0.0082 -0.0079	0.0029 -0.0054	0.0035 -0.0062	0.0041 -0.0095	0.0013 -0.0075	-0.0006 -0.0062	-0.0040 -0.0061
Age_male	-0.0019 -0.0291	-0.0085 -0.0198	0.0202 -0.0241	-0.0129 -0.0210	0.0281 -0.0218	0.0384* -0.0217	-0.0074 -0.0240	-0.0049 -0.0247	0.0116 -0.0296	0.0073 -0.0205	0.0230 -0.0239	-0.0037 -0.0225
(Age_male)2	0.0006 -0.0008	0.0005 -0.0006	0.0000 -0.0007	0.0005 -0.0007	-0.0004 -0.0006	-0.0007 -0.0006	0.0006 -0.0007	0.0006 -0.0007	0.0003 -0.0008	0.0002 -0.0006	0.0000 -0.0007	0.0004 -0.0007
Educ_female	-0.1280 -0.0794	-0.0332 -0.0555	-0.129** -0.0646	-0.172*** -0.0499	-0.0678 -0.0506	-0.0649 -0.0495	-0.0727 -0.0530	-0.0830 -0.0553	-0.141* -0.0797	-0.0503 -0.0565	-0.141** -0.0607	-0.189*** -0.0535
(Edu_femal)2	0.0039 -0.0066	-0.0004 -0.0042	0.0057 -0.0039	0.0188*** -0.0032	0.0024 -0.0036	0.0024 -0.0034	0.0024 -0.0039	0.0033 -0.0039	0.0047 -0.0066	0.0006 -0.0043	0.00621* -0.0037	0.0194*** -0.0034
Age_female	0.077*** -0.0271	0.0187 -0.0192	0.0547 -0.0333	0.0386* -0.0201	0.0327 -0.0229	0.0239 -0.0216	0.0560** -0.0236	0.0514** -0.0238	0.0836*** -0.0255	0.0273 -0.0194	0.0522* -0.0307	0.0440** -0.0221

Table 2.9 continued

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	On-farm				Off-farm				Total			
	Male FE	Male FE-IV	Female FE	Female FE-IV	Male FE	Male FE-IV	Female FE	Female FE-IV	Male FE	Male FE-IV	Female FE	Female FE-IV
(Age_female)2	-0.0024***	-0.0007	-0.0012	-0.00121*	-0.0008	-0.0005	-0.00127*	-0.0011	-0.003***	-0.0010*	-0.0012	-0.0013*
	-0.0008	-0.0006	-0.0009	-0.0006	-0.0006	-0.0006	-0.0007	-0.0007	-0.0008	-0.0006	-0.0009	-0.0007
Children_tot	-0.0051	-0.0304	0.0840	0.0588	-0.0700	-0.0735	-0.0290	-0.0277	-0.0014	-0.0212	0.1120	0.0989
	-0.0772	-0.0545	-0.0657	-0.0578	-0.0607	-0.0621	-0.0546	-0.0547	-0.0786	-0.0564	-0.0683	-0.0658
Student_m	0.1220	0.0442	0.0716	0.0302	0.130**	0.125**	0.108*	0.118**	0.1100	0.0334	0.1100	0.0726
	-0.0984	-0.0695	-0.0787	-0.0645	-0.0611	-0.0608	-0.0598	-0.0598	-0.0935	-0.0702	-0.0765	-0.0696
Student_f	-0.0515	-0.112*	-0.0583	-0.0906	-0.0568	-0.0652	-0.0368	-0.0441	-0.0523	-0.111*	-0.1250	-0.156**
	-0.1050	-0.0658	-0.0817	-0.0647	-0.0664	-0.0673	-0.0660	-0.0653	-0.1050	-0.0659	-0.0814	-0.0702
Full_timeyou_m	0.0605	0.0761	0.0786	0.154**	0.1020	0.0946	0.0779	0.0867	0.0461	0.0605	0.0838	0.156*
	-0.1080	-0.0788	-0.0924	-0.0785	-0.0973	-0.0997	-0.0813	-0.0793	-0.1100	-0.0845	-0.0907	-0.0831
Full_timeyou_f	0.0478	-0.0301	0.1020	0.0607	-0.0280	-0.0064	-0.0324	-0.0354	0.0850	0.0152	0.0956	0.0668
	-0.1260	-0.0848	-0.0926	-0.1060	-0.0919	-0.0949	-0.0984	-0.0985	-0.1220	-0.0884	-0.0992	-0.1110
Mature_male	-0.576***	-0.407***	-0.0107	0.00677	-0.0943	-0.0352	-0.0197	-0.00731	-0.592***	-0.424***	-0.0361	-0.0292
	(0.106)	(0.0732)	(0.0845)	(0.0838)	(0.0827)	(0.0825)	(0.0751)	(0.0747)	(0.104)	(0.0745)	(0.0866)	(0.0883)
Mature_fem	-0.0340	0.0364	-0.478***	-0.278***	-0.0322	-0.0276	-0.163**	-0.109	0.00347	0.0645	-0.399***	-0.248***
	(0.109)	(0.0756)	(0.0931)	(0.0727)	(0.0816)	(0.0749)	(0.0760)	(0.0727)	(0.110)	(0.0785)	(0.0989)	(0.0826)
Age_head	0.00421	0.0129	-0.0508*	-0.0324	-0.00991	-0.00630	-0.0332	-0.0226	0.0111	0.0193	-0.0476	-0.0305
	(0.0354)	(0.0208)	(0.0307)	(0.0235)	(0.0218)	(0.0223)	(0.0236)	(0.0233)	(0.0347)	(0.0214)	(0.0313)	(0.0290)
Eduthead	0.0143	0.0171	0.0990**	0.0459	-0.081**	-0.0907**	-0.098***	-0.116***	-0.0003	0.00489	0.0509	0.00846
	(0.0525)	(0.0358)	(0.0428)	(0.0498)	(0.0348)	(0.0362)	(0.0355)	(0.0374)	(0.0498)	(0.0359)	(0.0417)	(0.0473)
Constant	3.020***	0.651	3.378***	1.121	0.669	0.595	1.322	0.0693	2.930***	0.555	4.177***	1.508
	(0.996)	(0.921)	(0.921)	(1.146)	(0.773)	(1.409)	(0.803)	(1.313)	(1.003)	(1.020)	(0.920)	(1.228)
Observations	1,015	1,011	1,015	1,011	1,015	1,011	1,015	1,011	1,015	1,011	1,015	1,011
R-squared	0.267	0.643	0.198	0.389	0.168	0.169	0.184	0.188	0.273	0.606	0.185	0.277

Source: survey results Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: other additional regressors used in the model include sex of household head, woreda dummies, livestock diseases, farm tools, land certificate.

After controlling for unobserved heterogeneity (FE estimates in column 1, column 5 and column 9), I find positive and significant shadow wage elasticities (0.40, 0.11 and 0.40 for on-farm, off-farm and total labor supply of male youth members, respectively); suggesting an upward sloping youth male labor supply. The magnitude of the estimates (own shadow wage elasticity and shadow income) for male youth members in this study are similar to the previous empirical findings of Skoufias (1994), Jacoby (1993) and Kien (2009), though on-farm wage elasticity is a bit higher in this study. An important notable difference observed by comparing the coefficients for male youth members working on-farm with that of male youth members participating in the labor market is the effect of shadow wages on both types of labor supply. The effect of shadow wage is higher in an on-farm labor supply compared to off-farm (0.40 vs 0.11). This suggests that family members have stronger work incentives of working on-farm compared to off-farm work.

The negative effect of female youth members shadow wage on male youth members labor supply suggests that male and female youth labors are gross substitutes. The significance of this cross-wage effect is “consistent with family utility maximization and it suggests that studies that strict such cross-wage effects to be zero may yield estimates that are subject to specification error” (Skoufias, 1994: 224). However, the positive effect of female mature members shadow wage on male youth members labor supply indicates gross complementarity (or less substitutability) between the two labor categories. The less substitutability of labor between male youth members and mature female members, given the agricultural production system in Ethiopia, is as expected. Men mainly do activities such as planting, ploughing, harvesting and threshing of some crops [such as teff, wheat, barley, and pulses].

The coefficients on year dummies describe how average time spent in agricultural activities has changed over time for the different groups, controlling for changes in key demographics; trend indicator. Using the 2010/11 main agricultural production season as a base year, male youth members’ on-farm labor supply is decreasing whereas the off-farm labor supply is increasing. There is a decreasing trend in total labor supply since the on-farm labor supply decrease is greater than the off-farm labor increment. However, none of them are statistically significant, an indicator that youth are not disengaging in agriculture, rather working less number of days on family or own farm and working more hours on others farm for a wage (to some extent changing farm work locations for migrant youth) as revealed in off-farm increment. The conclusion of the main result remain unchanged after controlling for some variables such as part-time workers, the age of youngest or oldest son-there is no significant reduction in the labor supply of male youth members.

The effect of male member’s education, age and their squares, which is an indicator of experience and life cycle effects on labor supply is insignificant, interestingly education has a positive effect, though. Education could affect labor supply indirectly through its effect on marginal productivity and profitability in farm production. The effect of age of female youth members on on-farm male youth labor supply is positive and significant. As a female youth in the household get older, the labor supply of male youth members increases. This is mainly because of the fact that at an early age there is

substitutability while at the later ages the two labor categories play some complementarity. In addition, as female members get older, they leave the household because of marriage. This, in turn, creates labor shortage in the household. To fill that gap, the household increases the allocation of male youth members' labor. As to the family composition variables, the number of male mature household members is the only significant variables affecting labor supply of youth male members. Off-farm labor supply of male youth members increases with a number of male student members in the household. On the other hand, on-farm labor supply of youth male members' decreases significantly with the number of mature labors in the household since the two labor types are substitutes.

The effect of female shadow wages on youth female members labor supply is negative and strongly significant at 1% level, suggesting that female youth agricultural labor supply is backward bending. The effect of shadow income on female youth labor supply is partly realized through the reallocation of labor from on-farm to other activities such as schooling and domestic work. This is reflected in backward sloping labor supply and a recent increasing trend in school participation of female youth, which is also consistent with the marginal role female youth play in agricultural production. This effect is more pronounced via the effect of female youth members' education on total labor supply. As the sign of wage elasticities is theoretically unpredictable, this result is not unusual considering the agricultural production system of farm households in rural Ethiopia. It should be noted, however, that the estimated marginal productivity for female youth members could be a biased estimate of the shadow value of time of female youth members that work mainly on domestic activities and not in crop production (26 % of households reported zero working days of female youth members in either in an on-farm or off-farm). Since I pooled a household resource in the estimation of male and female youth members labor supply, it also may bias the estimates. Furthermore, measurement errors would be an avoidable that may influence the magnitude and direction of the estimate. The positive effect of female shadow wages on female youth labor supply, after instrumenting shadow wages, suggests this line of thinking. Female youth members' on-farm and off-farm labor supply are decreasing over time though none of them is statistically significant, an indicator also that cast doubt on the presumption that youth are exiting agriculture. An important difference observed is the effect of shadow income on on-farm and off-farm female labor supply: an increase in shadow income induces a decrease in on-farm female labor supply whereas it induces an increase in off-farm female labor supply.

Similar to the findings of Skoufias (1994) female youth members' labor supply appears to exhibit the usual concave pattern in age with adult female members working less. The family composition variables that appear to have a significant effect on female youth members labor supply (off-farm) include a number of male youth students and number of mature female members. Off-farm female youth labor supply increases with the total number of male youth students in the household. The labor supply of female youth members' (on-farm and off-farm) decreases with a total number of female mature members'. Unlike the case for male youth members, the effect of education of the household head on

on-farm female youth members labor supply is positive and significant at 5% level whereas the effect is negative on off-farm labor supply.

So far, I have focused on results of the fixed effects estimators without instrumenting the endogeneity of key variables of interest such as shadow wages and shadow income. In columns 2, 4, 6, 8, 10 and 12, I present FE-IV estimators of the different labor supply models. As stated earlier, the fixed effects estimation enables to remove the time-invariant unobservable characteristics (μ_i) but not the time variant unobservables (μ_{it}) that are potentially correlated with the error term $\epsilon_i(h, t)$. The difficult exercise here is to find appropriate and good instruments for shadow wages and shadow income. For an instrument to be valid, two conditions need to fulfil (Sargan, 1958; Stock et al., 2002). First, the instrumental variables should strongly correlate with the endogenous variables, and second, the instruments must influence the outcome variables through the endogenous variables (i.e. exogeneity of the instruments -the exclusion restriction criteria). Accordingly and in line with the previous studies, who have used similar approaches (Tassew, 2000; Awudu and Punya, 2000; Jacoby, 1993), I propose to use the following instruments for the shadow wages and shadow income: housing facilities (roof type, floor type, and bed type), ownership of mobile phones and radios, jewellery, ownership of cart and youth population density. In addition to the above instruments, ownership of stove, sources of drinking water during rainy and dry seasons are used in female youth members. Though debatable, these variables are assumed to affect shadow wages and shadow income but not number of working days. Accordingly, the validity of these instruments is tested.

Higher youth population density¹⁵ causes more available infrastructure per youth worker, which enhances labor productivity, facilitate the availability of fertilizer and other inputs (Glover and Simon, 1975). Ownership of mobile and carts increase labor productivity-they channel the effect of capital investment through wages on labor supply. Housing facilities, ownership of stoves, and source of drinking water improve health and thereby raise shadow wages (or labor productivity of individuals); hence influence number of working days through shadow wages and income. In this respect, these variables can be qualified as good instruments that capture variations in shadow wages and shadow income. One the other hand, it's unlikely that these variables directly determine the number of working days. The statistical evidence on the exclusion restrictions using the Sargan and Basman test of overidentifying restrictions shows that the identified instruments explain a number of working days indirectly only via its correlation with shadow wages and shadow income. The results of the tests for the validity of the instruments are presented in Appendix Table B. The first stage regressions in appendix Table B show that the coefficients of all instruments are statistically significant in explaining the endogenous shadow wages and shadow income largely; except for jewelry. As stated above, the

¹⁵Youth population density explains about 12-13 percent of the total variations in the shadow wages of male and female but none of them are significant in explaining labor supply.

exogeneity of the instruments is tested using the Sargan and Basman test of overidentifying restrictions. There are concerns that radio and stove may be a direct cause of labor supply if these variables are other determinants of a number of working days. In this case, these variables may not serve as exogenous instruments (Appendix Table A2.2).

Focusing on the total labor supply FE-IV estimators, I find that the effect of shadow wage elasticities is higher and strongly significant in all the models than that reported by the FE estimators. In the male youth members' labor supply model, there are no dramatic changes in the sign of the estimated coefficients. However, there are dramatic changes in the size and significance of some of the estimated coefficients. For instance, variables such as education of a female, shadow wage for female youth, and age of female become insignificant and the only variable that becomes significant is a number of female youth students in the household. In the female youth members' labor supply model, there are not only dramatic changes in the sign but also in the magnitude of the coefficients estimated. For instance, the negative value of female youth agricultural labor products (or shadow wage) of female youth members disappear and turns to positive while its magnitude has increased dramatically (from 0.26 to 1.16). The effect of male mature members' productivity on female youth members' labor supply becomes significant, with a change of sign from positive to negative. Though decreasing trend is observed in both male and female members total labor supply in agriculture, none of them are significant. These findings suggest again that youth are not disengaging from agriculture. Other explanatory variables in the female youth members' total labor supply model that show an increase in magnitude and significance include female mature shadow wage, education of a female, the age of the female, the total number of female youth students and the total number of male full-time youth in the household. The negative effect of female education on female youth labor supply remains negative and strongly significant. In general, all the results indicate that the trends and patterns of youth involvement in agriculture vary across gender and farm work locations; so do the values of their agricultural labor products. For comparison, the labor supply functions in equations (2.28) and (2.29) were re-estimated for the sub-sample at the individual level. The overall similar trend, pattern, and magnitude in the estimated coefficients have been observed (results not reported here).

2.7. Testing for separability: equality of shadow wages and market wages

In order to test whether the labor market functions efficiently, I examined the relationship between the estimated shadow wages (the value of marginal products) and market wages (Jacoby, 1993). Assuming that farm households maximize utility, the marginal productivity of work on the family farm should be equal to the market wage received by family members working on the off-farm, if separability exists. This means that the estimated $\hat{\beta} = 1$ and $\hat{\alpha} = 0$, when there is separability. In this context, individual's allocation of time between farm and market is made purely on efficiency grounds, and

there is an efficient labor market. I report the results of the test in Table 2.10, which is obtained from the regression of the form:

$$\ln W_{it}^* = \alpha + \beta \ln W_{it} + \varepsilon_{it} \quad (2.30)$$

Where W_{it}^* is the estimated shadow wage of labor type i = male youth members, female youth members in year t (i.e. the estimated marginal product of labor i derived from the production function stated in equation (2.22)); W_{it} is the wage received by working in the off-farm labor market in year t and ε_{it} is a random term. The observed market wage is instrumented for possible measurement errors using the variables age, education, and their squares. As one can see in Table 2.10, the results strongly rejected the existence of separability; suggesting that the use of non-separability approach best predicts the agricultural labor supply of youth members and likely to produce more reliable policy conclusions.

Table 2.10: Test for separability

Variables	Jacoby Test (Ho: $\beta=1$ & $\alpha=0$)	Benjamin Test
Log (predicted Wm)	2.117*** (0.198)	2.106*** (0.555)
Constant	-1.757*** (0.616)	-4.584*** (1.396)
Observations	1,220	1,192
F-test for joint significance:	0.000	

Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: survey results

2.8. Conclusions and policy implications

The dichotomy often exists in the literature of agricultural household members allocation of their labor is its inadequacy to distinguish whether market and non-market labor is spent on-farm or off-farm and for which household member and age category is the phenomenon refers to (Bezu and Holden, 2014; Ahaibw et al., 2013; Agwu et al., 2014). Second and most importantly, if I want to understand the behavior of youth career choices, I need to understand how youth labor is allocated within or among households that involves both market and non-market economy. In doing so, I investigate the trends, patterns and analyze the effect of shadow wages on youth labor supply in agriculture, disaggregated by gender using household and youth sample survey data collected during 2010/11 and 2014/15 agricultural seasons. I find that trends and patterns of youth involvement in agriculture vary across gender and farm work locations; so do the values of their agricultural labor products. Whilst the participation of youth in on-farm for both sex is declining across time (though insignificant), the participation in off-farm is increasing for both. The total agricultural labor supply for both male and female youth is decreasing but none of them is significant. The effect of male youth shadow wage on male youth members labor supply is positive and significant, suggesting an upward sloping male youth labor supply. However, FE estimation results indicate that the effect of female shadow wage on female youth labor supply is negative and strongly significant at 1% level, suggesting that female youth labor

supply is backward bending. Our results also indicate that the magnitude of shadow wage elasticities and shadow income depends on the estimators chosen. The shadow wage elasticities are especially higher when instrumenting for shadow wages, a higher result than what is reported in some other studies. Furthermore, our results suggest that aggregating heterogeneous labor productivities in the computation of shadow wages are likely to mislead policy conclusions.

Taking into account intensity of youth involvement on the family farm or own farm, off-farm as well as their farm work at the destination for youth migrating to other rural and peri-urban areas, the results challenge the presumption that youth are exiting agriculture, at least in agricultural potential areas of Ethiopia. Instead, youth's labor makes an important economic contribution to the operation of their family or own farm. Based on descriptive and econometric results, I conclude that the myths of departing youth participation in agriculture over the last decade do not necessarily emanate from the trend and evolution of participation in agriculture but also from the methodological drawbacks. For instance, the comparison of youth responses regarding their intentions (plan) to work in agriculture and the farm level realized time spent by household members (including youth members) between 2010/11 and 2014/15 agricultural seasons, indicate that realized youth engagement in agriculture and the intention to engage in the sector vary greatly. Limitation of data regarding youth labor allocation in agricultural production has also contributed to this inconclusive finding in the literature, especially the absence of panel data. Thus, analyses that use intentions alone to examine youth labor market outcomes would likely produce misleading policy implications.

Our estimation approach tests the existence of separability-the hypothesis strongly rejected in the estimation in favor of a non-separation model. A policy implication of the results suggests that changes in economic incentives such as marginal productivities (shadow wages) matter for youth involvement in agriculture, but the impact of it induces different outcomes for male and female youth members labor supply. In addition, governments need to give proper attention to agricultural development since improving agricultural labor productivity both at on-farm and off-farm level would help to provide employment for youth that helps to reduce unemployment and underemployment. Moreover, attributes related to youth female members such as their education and age, the composition of family structures and education of the household head matters for youth participation in agriculture. Furthermore, a structural transformation that addresses the imperfections and rigidities in labor and other input markets (especially land, fertilizer, seed) as well as poor infrastructure and social impediments that condition access to markets and services in rural areas need to be addressed to make agriculture more attractive to the youth.

3. INTRA-HOUSEHOLD POSITIONAL CONCERNS AND WELL-BEING OF THE RURAL YOUTH IN ETHIOPIA: IMPLICATIONS FOR RESOURCE ALLOCATIONS

Abstract

Empirical evidence documenting the link between parents' positional concerns for income and the well-being of their children is scant. This paper aims to fill this gap. Specifically, I explore how and to what extent positional concerns differ within a household (between youth, fathers and mothers) and how they are linked to the well-being of youth. In doing so, the study employs survey experimental methods and a socio-demographic survey. The survey experimental approach is based on a tailor-made experimental design conducted among Ethiopian youth and their parents (fathers and mothers) in rural areas. Our analysis suggests that youth display higher positional concerns for income than their parents do. The results also differ across gender: female youth are more positional than male youth. Our results also suggest that factors motivating positional concerns for income differ across household groups and gender categories. Estimation results further show that youth's own and their fathers' positional concerns are significantly associated with the well-being of youth. Though mothers display a higher positional concern, I find no significant association between mothers' positional concern and the well-being of youth. The strong significant effect of fathers' positional concerns on well-being compared to mothers' may have to do with differences in intra-household bargaining power affecting resource allocations, social norms and/or preferences. I discuss the implications of these findings.

Keywords: Ethiopia, youth, parents, positional concerns, survey experiment, subjective well-being

3.1. Introduction

A relative concern (or positional concerns) is one mechanism through which income or wealth inequality is hypothesized to affect components of well-being such as health, happiness, or human capital formation (Stark, 1991; Graham, Nikolova, 2015). Adjaye-Gbewonyo and Kawachi (2012: 130) stated that “when income inequality rises, this may result in inequalities in access to material goods that have become the norm in a society or ability to participate in common social activities such as employment or social networks.” Townsend first articulated this idea in 1979 (Townsend, 1979). To ease the feelings resulting from relative concerns (i.e. lagging behind others), household members, especially parents, may redirect allocation and distribution of household resources (material as well as non-material) to themselves or members of the family so that the relative standing of family members in terms of income or wealth can improve. Empirical evidence shows that a household or its members undertake economic decisions not necessarily to increase the household's income or own absolute income but rather to improve the household's income or own position with respect to others in a specific reference group (Stark, 1991).

There is a growing empirical literature investigating positionality or relative concerns in the context of optimal taxation (Boskin and Sheshinski, 1978; Ljungqvist and Uhlig, 2000; Alpizar et al., 2005; Aronsson and Johansson-Stenman, 2008), labor supply (Park, 2010), saving and investment (Abel, 1990; 2005) and migration (Stark and Taylor, 1989; Akay et al., 2012b), among others. However, empirical evidence documenting the link between positional concerns of parents and well-being (SWB) of offspring (in this case youth) in developing countries is scant and the existing findings are inconclusive (Anderson, et al., 2014; Carlsson et al., 2007a; Ravallion and Lokshin, 2010; Akay and Martinsson, 2011). The existing evidence also suggests that positional concerns in poor societies have less effect on the well-being of the poor than absolute concerns (e.g. total income) (Akay et al., 2012a; Akay et al., 2014). These studies often build on the assumption that household members have homogenous preferences toward positionality (hence have identical utility functions) and the attitudes towards such positionality do not vary across age cohorts. However, emerging empirical evidence indicates that there is heterogeneity of preferences toward positional concerns among different age cohorts. For instance, Pingle and Mitchell (2002) find that those who are younger more likely exhibit positional concern for income.

Concern for positionality implies that individuals or groups compare their (or others) wealth, income or consumption level with ‘‘relevant others’’ or ‘‘reference groups’’. This means that the utility that people derive from saying income or goods depends on the absolute amount of income or goods consumed and the amount of income or goods consumed relative to the amount of income, goods consumed by others (Frank, 1999; Akay and Martinsson, 2011; Pingle and Mitchell, 2002; Stark, 2010). Recent empirical work provides evidence that people take actions out of concern for positionality (status) (Clark and Oswald, 1998; Pingle and Mitchell, 2002). In other words, people take actions such as working longer hours, shifting allocation of resources, migrating to other places or changing occupations to improve their relative standing; and to some extent engage in riots or uprisings (this is becoming evident with the manifestation of uprisings among young generations in developing countries) out of concern for fairness and altruism.

The implications of positional concerns on individual welfare has been studied using two approaches: survey experiments (Johansson Stenman et al., 2002; Alpizar et al., 2005; Carlsson et al., 2007a; Akay et al., 2012a; Akay et al., 2014) and subjective well-being data (Ferrer-i-Carbonell, 2005; Luttmer, 2005; Clark et al., 2008). Evidence from the two approaches indicates that while own utility is significantly and negatively affected by the income or consumption of others in rich countries, the effect of positional concerns (relative concerns) on the utility of individuals in poor countries is mixed. For instance, using the subjective well-being approach, Carlsson et al (2007b), Ravallion and Lokshin (2010), and Akay and Martinsson (2011) find that relative income does not significantly affect the well-being of the poor. Akay et al. (2012a; 2014) find a similar conclusion using a survey experiment carried out in Northern Ethiopia among mature and poor households. The drawback of the studies includes the

following: In all the studies, the sample is biased to mature households and fail to cover different age cohorts as well as gender categories within households (addressed household heads only and implicitly assume households are homogenous). In addition, these studies assume that reference groups are the same across all individuals of different age cohorts. Furthermore, in their regression analyses, the authors simply try to capture such heterogeneity using age variable along with other control variables. However, empirical evidence indicates that the standard aggregation with a quadratic control for age cannot capture the effects of positional concerns; rather it can obscure major differences in the effects of relative concerns (FitzRoy, 2011).

In general, empirical work suggests that increased concerns for relative income or consumption levels among individuals would affect sons' or daughters' well-being through either "material pathways" or through "psychological factors" (Gordon and Spicker, 1999; Lhila and Simon, 2010; Sweet, 2011). Whereas the "material pathways" refers to uneven access to material goods and services as a result of rising inequality or parents' allocation of resources to improve the relative standing of family members; "psychological factors" denotes frustration or stress among the relatively deprived. The later also refers to parental cares or praises that can affect the mental or physical well-being of the youth (Stafford et al., 2016). Positional concerns may also induce a stronger pursuit of status that motivates or inspires individuals to work hard and gain higher wealth that in turn fosters life satisfaction. For instance, Stark (2006) shows that an increase in the inequality of wealth prompts a stronger quest for status that in turn foster the accumulation of wealth. From the youth's perspective, relative concerns (or positional concerns) could affect their well-being via peer effects, i.e. behavioral change resulting from observations of how others in the reference group are performing.

As stated earlier, parents heterogeneity in preferences (in our case reflected through parents positional concerns) may affect household members in several ways: allocation of resources within households, allocations of consumption to members that have both short term and long terms implications for transmission of poverty, development of human capital, as well as well-being. Yet little has been done in this regard in economics, especially encompassing the different age groups in households (youth, father, and mother) (Blundell et al., 2005; Basu, 2006; Dunbar et al., 2013). For example, Dunbar et al. (2013), using data from Malawi, indicate that allocation of resources from male spouses to the female can affect the shares directed to children. In their estimation, like in this paper, each child is represented as having their own utility function. Positional concerns differ among fathers and mothers, across households and within households based on preferences, gender, birth order, resource availability, resource allocation, sharing rule, institutional features, norms, etc. (Thomas, 1990). Most studies often miss an important element of the distribution of welfare that can vary dramatically depending on the power relations within the household (for example, the different effect of fathers' and mothers' positional concerns on the well-being of members depends on the role and or power relation of members, including fathers and mothers).

Whether parents' attitudes toward positionality (regarding the income prospects of their children) and their attributes are important for the well-being of youth members is a question that requires empirically investigated. In line with this, I ask the following questions: Do parents' attitudes toward positionality and their attributes matter for youth in Ethiopia? If so, how might parents' attitudes toward positionality affect the well-being of the offspring, especially youth members? This chapter is devoted to addressing the above questions. In doing so, I first investigate whether there is intra-household (youth, father, mother) heterogeneity in positional concerns (or status concerns) and what determines positional concerns. Following that, I examine whether and in what way youth subjective well-being is associated with their own and with parents' attitudes toward positionality.

Though experimental research documenting the effects of positional concerns on well-being has brought new insights into economic phenomena that are not easy to capture using the standard approaches of neoclassical approach, patterns, origins and the mechanisms through which positional concerns persist within households and between peers (social comparisons) remain understudied in the economic literature. Particularly given the adverse development and social ramifications of intra-household and the inter-household quest for status, analyses of the patterns and drivers of parents' attitudes towards positionality and the interrelations with the well-being of their members (in this case youth members) is essential for framing appropriate public policy towards youth development. Examining the effects of positional concerns among the population of different age cohorts have important implications for poverty alleviation and social welfare. For instance, interventions based on some socioeconomic criteria in communities or areas where there are strong positional concerns may result in 'conspicuous consumption': diverting scarce resources (from productive investments and savings) to unproductive ones that could hamper the success of the poor or youth and sometimes may lead to greater inequality and migration. It might also lead to more self-investment or investment in members that can enhance welfare (Linssen et al., 2011). Our paper contributes to this literature by documenting the existence of an important relationship between parents' (with a special focus on fathers and mothers) positional concerns and the well-being of youth members using a survey experimental methods matched with a socio-demographic survey.

The impact of fathers' or mothers' preferences to devote resources to the well-being of members (reflected through improvement in the well-being of the offspring) have been studied in sociology and psychology intensively, but only at an infant stage in the field of economics (Lundberg, 2005; Biblarz and Stacey, 2010). Most of the existing studies focus on the effect of child-gender on fertility decisions, marriage stability, time allocation decisions and parenting behavior and not the other way around.

This study is different from the existing studies at least in three ways. First, methodologically the study combines a survey experiment with socio-economic survey data and information generated via focus group discussions (FGD)). Second, in terms of sample composition, the study is the first in its kind

targeting youth, and each parent separately: fathers and mothers. Third, in terms of analyses, the effects of parents' positional concerns on the well-being of youth members are computed separately for fathers and mothers. Exploring the relationship between parents' positional concerns and youth members' well-being is particularly relevant in the context of rural Ethiopia for the following reasons.

First, young age is the age in which parents invest household resources for economic independence of youth, which partly depend on the attitudes of parents toward positionality. Second, it is important to look at whether youth SWB is responsive to parents' concerns about positionality (or status) and whether this differs across gender and youth type. This helps to understand the mechanisms through which intra-household preferences towards positionality might persist and empirically test some hypotheses on the role of parents' attitudes toward positionality in determining current youth well-being. Finally—unlike the common practice in the literature that uses household head characteristics to analyze the role of parents' attributes in the well-being of members (Santos et al., 2013; Clark and Sofer, 2004; Becker, 1965) — this study directly approach both fathers and mothers. This approach better captures intra-household dynamics and enables us to capture the effects of parents' positional concern and its impact on the well-being of youth members. I also believe that this approach helps to improve our understanding of the extent of differing intra-household behaviors in influencing the welfare of youth members.

The remainder of the chapter is organized as follows. Part 2 is a brief review of literature and description of theoretical framework employed in this study to link parents' attitudes toward positionality with the well-being of the youth members. Part 3 presents the data, experimental design and measurement issues. Part 4 provides descriptive characteristics of youth and their parents, and estimation techniques. Part 5 provides estimation results and discussions. Finally, part 6 summaries the findings and concludes. Appendices are presented at the end.

3.2. Linking parents' positional concerns and their attributes to well-being

There are different explanations in literature as to the relationship between relative income and well-being. For instance, a positive relative concern can be interpreted as a sign of community ties and altruistic preferences among poor rural households (Kingdon and Knight, 2007; Bookwalter and Dalenberg, 2010, for South Africa and Akay et al., 2012, for China). For instance, Akay et al (2012) find a positive and significant effect of relative income on the well-being of migrants in China. Alternatively, it may reveal a 'signal effect' or 'tunnel effect' (Hirschman, 1973), i.e., a worker's well-being that is positively affected by the observation of faster income progression of others if they interpret this movement as a sign that their own turn will come around soon. For instance, respondents indicate that reference income serves as information to create future expectations and as an aspiration for the possibility of achieving that income level. Hence, under such conditions, relative income may

be positively correlated with SWB. Opposite effects, status effects and signal effect may offset each other, and their relative weight depends in particular on beliefs about social mobility (Senik, 2008).

In linking parents' positional concerns with well-being of youth members, there are two common ways to model positional concerns (status concerns) in a utility framework: 1) a ratio comparison utility function, $U = u(Y, \frac{Y}{\bar{Y}})$, where Y refers to individual income earnings, and \bar{Y} is the average income in the society (Persson, 1995) and 2) additive comparison utility function, $U = u(Y, Y - \bar{Y})$ (Akerlof, 1997). In this study, I choose to use the additive comparison utility function of the following form:

$$U_i(Y_i, Y_i - \bar{Y}_s) = (1 - \gamma)Y_i + \gamma(Y_i - \bar{Y}_s) \quad (3.1)$$

Where U_i indicates the utility of an individual i ; Y_i is individual income, \bar{Y}_s is average income in the reference group (i.e. the average income in the society A or B); γ measures the marginal degree of positional concern, i.e. the portion of the total change in utility that comes from an increase in relative income after a marginal increase in own absolute income; $0 \leq \gamma \leq 1$. Based on the utility function specified in (3.1), γ is expected to be positive, and that a higher γ indicates a stronger positional concern for that specific subject. It should be noted also that the positive sign of γ does not imply a utility increase as in the case of the SWB approach.

The utility function adopted here contains two important elements: 1) a parameter $\gamma \in [0,1]$ that measures the degree to which parents or youth own positional concerns affect well-being of youth members as opposed to absolute income (see Eq. 3.1) and 2) the curvature of the welfare function as it is affected by positional concerns (Pingle and Mitchell, 2002). The assumption here is that the preferences of participants can be expressed using the utility function and the nature of the data allows one to infer what properties the utility function should possess in order to infer a specific type of behaviour observed. For instance, the distribution of data could indicate whether preferences are heterogeneous or not, whether a fraction of youth, fathers and mothers exhibit tendencies to give weight to relative concerns and whether fraction of youth, fathers, and mothers give weight to positional concerns.

Since the utility of youth depends not only on their own positional concern but also on the positional concerns of their fathers and mothers as well as their attributes, I extend a utility function presented above assuming the following relation:

$$U(i, h) = SWB(\gamma_i, \gamma_f, \gamma_m, X, Y_h), \quad (3.2)$$

Where U is the economic concept of utility or well-being of youth i who is a member of household h , $\gamma_i, \gamma_f, \gamma_m$ stands for the marginal degree of positional concerns of youth who are members of household h , father and mother subjects, respectively; X denotes individual and household attributes (including father and mother characteristics) as well as community and institutional factors that influence well-being of youth. Set of variables categorized under X , that influence youth SWB has been

widely discussed in both economics and psychology literature (Alpizar et al., 2005; Pingle and Mitchell, 2002), and in this paper I consult variety of literature to include relevant variables deemed to affect well-being. Y_h denotes the household income. Our empirical analysis presented under section 3.6, which I briefly discuss under estimation strategy, is based on different specifications of Eq. (3.2).

A second specification will add the marginal degree of positional concerns of fathers and mothers as well as their individual characteristics such as age, education and their relationship or role in the household. The marginal degree of positional concerns of both fathers and mothers are anticipated to be positively correlated with sons' and/or daughters' subjective well-being. In this case, fathers and/or mothers preferences are toward equal society. In other words, the higher the marginal degree of positional concerns of parents, the higher the son/daughter SWB living in Bi society, i.e. in a society where income difference is less. If it is negatively related and significant, it means that its absolute income that matters most for the well-being of youth and relative income comprises the smaller portion of the utility of youth. It also means that parents prefer their sons/daughters earn more income in absolute terms, irrespective of the income of others. In this case, the subject is less positional or has less preference for positionality (relative income). It can be interpreted in such a way that subjects use the higher income of the peers (comparison groups) as a signal effect in the sense that it is an indication of future earnings or prospects.

Finally, for comparison purpose, I also specify our estimation that SWB of youth is associated with youth's own marginal degree of positional concerns and the marginal degree of positional concern of a household head along with a set of individual and household characteristics or attributes. In this model, I specify that X include individual characteristics and the characteristics of the household head, besides the household assets (including family income) and community characteristics. This specification serves as a comparison model if head characteristics (or attributes) are used instead of father and mother attributes. This also serves as a sensitivity analysis of the relevance of the choice of parental variables.

3.3. Data and experimental design

3.3.1. The data

The primary research has three phases. Firstly, participatory rural appraisal techniques were employed to understand how positional concerns are perceived in the society, how such perceptions affect the well-being of people in general, and youth in particular, and to examine a good range of income figures to be used in the experiment. Secondly, a pre-test of the survey questionnaires was administered to the three groups of respondents: fathers, mothers, and youth. Finally, the experimental surveys (positional concern for income among the three categories of subjects) and socioeconomic surveys were addressed to these three groups. Activities carried out along the process (phases) are elaborated as follows:

Participants in both the experiment and socio-economic survey are drawn from the novel Ethiopian Agricultural Growth Program (AGP) youth and household survey covering agricultural potential areas

of Ethiopia. As stated earlier, out of the four regions of AGP sties, the study focuses on the Oromiya region and exclusively on youth (both as household members and as household heads) and their parents (mainly fathers and mothers) sub-sampled from the first wave conducted in 2010/11.

Multi-stage sampling techniques were employed to sub-sample households with youth members and youth household heads during the second wave. A subsample of 660 youth from 521 randomly selected households who were included during baseline was selected randomly during the second wave and participated in the experiment. Households who were selected but not available due to death or migration that made tracking difficult were replaced from the contingency list. The survey collected detail information on youth characteristics/attributes, household characteristics (or attributes), father characteristics(or attributes), mother characteristics, wealth as well as separate wealth owned and managed by the youth themselves, employment conditions, social networks, and life events. Community characteristics such as location and access to basic infrastructures, institutions, availability of youth-related projects and interventions in the areas were also collected. After eliminating some due to missing information, non-response, and inconsistency, I obtained a sample of 641 youth¹⁶, 291 fathers, and 341 mothers.

To ensure consistency and understanding, the experiment was administered by a set of administrator instructions. Prior to that, participant was presented a set of examples and offered explanations of the difference between the different hypothetical scenarios. During data collection, back and forth questions were raised and discussed as well to make sure that respondents have understood the game. In most cases, the experiment was carried out simultaneously for youth, fathers, and mothers. For household members who were not available, the survey was carried out one after the other to avoid communications/information sharing within families, learning, fatigue or a combination. In addition, respondents were instructed not to communicate with other participants during the survey period. A consent form was signed to keep the anonymity and confidentiality of the survey. All interviewers have at least first degree and accumulated experiences in conducting household surveys. All of them had obtained intensive training about the experiment, the questionnaires, and data collection methods, including practical demonstrations of the survey experiment. All had participated in the pre-test. Participation in the pre-testing has an advantage of enabling these interviewers to gain experience in administering the experiment and survey. It is after the experiment that the respondents participated in a survey in order to collect additional information on socioeconomic information of the subjects. In order to generate qualitative data that complement the quantitative findings, I carried out six focus group discussions in three woredas with selected groups (two with youth subjects, two with father subjects,

¹⁶ Because subjects for field experiments on positional concerns among youth members and their parents are randomly selected from the general follow up survey, the new sample is less.

and two with mother subjects). The student was present during the whole process and fluent in Afan Oromo, the main language spoken in the study areas.

3.3.2. Experimental design

In order to test the effect of parents' positional concerns and their attributes on life satisfaction of youth members, I limit the experiment to income per se. As stated earlier, the survey experiment consisted¹⁷ of two sections addressed to the three types of subjects (youth, fathers and mothers): i) positional concern from the effect of income by the youth subjects, father subjects and mother subjects; and ii) questions regarding the respondent's socioeconomic status. Heads of the household were provided with a list of additional questions related to household characteristics and assets. Let us turn to discuss the experimental design in more detail.

In the survey experimental methods, I present hypothetical scenarios similar to Johansson-Stenman et al. (2002) in order to measure the marginal degree of positional concerns by letting the youth, fathers, and mothers make trade-offs between youth hypothetical income and the relative income of other youth in the society¹⁸, keeping everything else equal. In doing so, youth were instructed to consider the well-being of their imagined income when making choices; while their fathers and mothers were instructed to consider the well-being of the youth under considerations when making their choices (see appendix A3.1 for the instructions presented to the three subjects). From the responses, I construct a marginal degree of positional concern and match the results with the outcome variable: the subjective well-being of youth. The computation of the marginal degree of positional concern is presented under measurements.

In the case of the fathers and mothers experiment, they were frequently reminded that they should not choose what they considered the overall best society, but the society that would be the best for their son (s) and or daughter(s), i.e. youth under consideration. They were frequently reminded that in all other aspects, the societies are identical; this briefing is especially important for fathers and mothers who always relate their choice with social and economic benefits they could receive from the support of their son(s) and or daughter(s). This was to help eliminate respondent bias based on their current circumstances, as well as liberate themselves from any conditions affecting their decisions. Though such exercises are not free from some biases¹⁹, it is possible that "it is presumably cognitively easier,

¹⁷ "A survey experiment differs from both laboratory and field experiments. A survey experiment is not monetary incentivized whereas in a laboratory experiment individuals are paid according to their choices. Field experiments have the feature of being conducted in people's normal life without them knowing they are part of an experiment."(Carlsson, 2010: 265)

¹⁸ Society (village) and the same age group was used as a composite reference group. This reference group was determined after focus group discussion and pre-test.

¹⁹ The experimental approach has some disadvantages. First, the survey experimental approach used in this paper, as is also common in recent studies, is based on a hypothetical scenario that may not reflect positionality preferences of the subjects. Second, the sample size is relatively small for fathers, as in the most experimental

and perceived to be a more natural task” to choose what is best for own son and or daughter than to choose for a complete stranger” (Alpizar et al., 2005: 409).

One of the advantages of this approach is that it does not suffer from the problem of unknown or switching reference groups (or both) since the reference groups are explicitly stated in the survey experiment. Though I extend later in the next chapter the use multiple reference groups, I chose to stick to one composite reference group (identified via focus group discussions and pre-tests) which subjects reported as the main comparison group against which one often compare their relative income. This helps to avoid confusion and fatigue. The reference group in this experimental analysis is assumed to be exogenous, a standard in empirical work (Stark and Taylor, 1991; Easterlin, 1997, 1995; Hyll and Schneider, 2014; Oshio et al., 2011, among others). A detailed analysis and issues related to reference group are presented in Akay et al. (2014) and Ferreri-i-Carbonell (2005). I present also the robustness of using various self-identified reference groups (identified through surveys) in analyzing the link between the subjective well-being of youth and the different dimensions of relative deprivation measured using objective and subjective approaches in the next chapter.

In the experiment, the three categories of respondents make repeated choices between two villages/societies, A and Bi, defined by the average income and the youth’s income. The choice of alternatives for all respondents starts from a choice with the lowest degree of positionality (from the six successive choices available to them, see Appendix Table A and B) until the respondent switches to the choice where they care more about absolute income than relative income. I assume that society A is a fixed alternative where the average income is 1080 birr per month and the youth’s income is 720 birr per month, the society (village) is then compared with six different B societies (villages) with varying individual incomes, but a given average income as proposed by Alpizar et al (2005). As such, the youth’s income in village B was chosen to correspond to a certain degree of relativity if the youth, father, and mother are indifferent between the two villages.

3.3.3. Measurement of positional concerns and subjective well-being

Marginal degree of positionality

Positional concerns can be measured in several ways: using the distance between individual income and mean or median income of the reference group; rank of the observation in the group; the marginal degree of positionality, etc. Following Alpizar et al (2005) marginal degree of positionality using the additive comparison utility function is computed as follows:

$$\gamma = \frac{Y_A - Y_B}{\hat{Y}_A - \hat{Y}_B}; \tag{3.3}$$

studies in the literature (see Carlsson, 2010 for the advantages and disadvantages of using survey experimental approaches to test positional concerns).

Where Y_A is individual hypothetical monthly income in society (village) A and \hat{Y}_A is average income of other youth in society (Village) A. Y_B is individual monthly income in society (village) B, and \hat{Y}_B is the average income of other youth in village B. Fathers' marginal degree of positional concern refers to positional concerns for father of youth members. The same is true with mothers and household heads.

The experiment begins offering youth to choose between society A, where their monthly income is lower than the average monthly income of the reference group (960 birr vs 1080 birr), and society B1, where their monthly income is higher than the average monthly income of the reference group but lower than their income in society A. Exact replicas are offered to fathers and mothers, except that fathers and mothers make their choices with respect to the youth under consideration (see appendix 3A.1). I assume that society A is a fixed alternative. If the individual chooses society A, the session ends since the individual has revealed their realized marginal degree of positionality. In this case, the realized degree of positionality is lower than the implied degree of positionality. If the individual chooses B1, then they are asked to choose between society A and society B2, where their income is further lower than in B1 but still higher than the income level in the reference group. Since the choice is always against society A, the degree of positional concern increases as we go from society B_i to society B_{i+1} . The process ends if an individual chooses society A or has reached the last choice set, i.e. B6, in this setting. Note that the reference group is also held constant throughout the process to make the process simple and easy for the respondent. An illustrative example for youth scenario is presented as follows (detailed instructions for the three groups are presented in appendix A3.1):

Imagine that you can choose to live in one of two different societies, society A and society B. Your monthly income and the average monthly income of people differ between the two societies. Except for the income differences, other things, like living expenses, are the same in the two societies. For each society that I will consider, I will tell you the amount of your monthly income and the average monthly income of the group. Then, I will ask you to choose which society you would like to live in. Let me illustrate this choice by the following example. In this example, I will just name the group of people "other youth."

Society	Your own income	Average income of other youth: birr/month
Society A	800	900
Society B	770	600
Which society do you choose to live in?		

In this example, the youth earns an income of 800 birr per month in society A while the average income of other youth in the same society is 900 birr per month. In society B, the youth income is 770 birr per month while the average income of other youth in that society is 600 birr per month. The youth monthly income is 30 birr more in society A than in society B. In society A, the youth earn 100 birr less than the average income of other youth in the society; while in society B the youth get 170 birr more. Given these differences, the youth is asked to choose either to live in Society A or B. When the subject (youth) chooses Society A, I computed the marginal degree of positional concern for each youth within an upper and lower bound. Using equation (3.3), the marginal degree

of positional concern is 0.1. In this example, if the youth chooses society (village) A, then it implies that the youth has a marginal degree of positionality lower than 0.1 ($\gamma \leq 0.10$). Through a repeated choice between the two set of choices, I am able to obtain information about their marginal degree of positional concerns, at least within an upper and lower bound. In the same manner, if a father and mother make the same choice, the marginal degree of positionality of a father and mother towards the youth under consideration is 0.10. Repeated choices between the two societies have been presented in a subsequent order for each youth, father, and mother. The lowest possible income choice in our experimental setting is about 720 birr. To avoid design effect related to income levels across the age cohorts (youth, father, and mother) in the choice sets, I decided to use the same income levels. Hence, the implicit degree of positionality is the same across the groups (father, mother and youth), changing between 0.1 and 0.6.

Subjective well-being

The use of well-being assessment questions such as life satisfaction has widely been used since 1930's by scholars such as Likert (Likert, 1932). Literature suggests various proxies of measuring subjective well-being (SWB) or life satisfaction, which are in general based on 'happiness', 'life satisfaction' or 'mental health' (Frey and Stutzer, 2002; Akay et al., 2013). Our data include both standard life satisfaction measures, referred here as subjective well-being, SWB, which allows subjects to rate their level of life satisfaction on a scale from 1 to 9 (1 indicating the worst possible life and 9 the best possible life), and work satisfaction measures of the general Edenred-Ipsos Barometer²⁰ that uses scores from 1 to 5 (1 strongly disagree and 5 strongly agree).

In computing SWB index from the first approach (referred here as option 1), I classify the measures into 5 ordinal categories, ensuring adequate variability at the same time reducing empty cells. In order to obtain a measure of SWB from the latter approach (referred here as option 2), I added the scores of the different items related to work satisfaction of individuals and derive a SWB index ranging from 12 to 71. I use this index as a proxy for the latent experienced individual utility, hence the low levels of the scores indicating low well-being while high scores indicating a relatively higher or better well-being. The subjective well-being measure of youth (option 1), a proxy variable to quantify subjective well-being of youth, runs as follows:

Say, we would like to ask you some questions about how you see your circumstances in comparison to others. There are nine steps on this ladder. Suppose the very top (the 9th step) represents the best possible life for you and the bottom represents the worst possible life for

²⁰ Edenred-Ipsos Barometer can be categorized into three pillars: the Environmental, Appreciation and Emotion (EDENRED-IPSOS, 2016). This alternative measure was originally designed to assess well-being of individuals at work. *Environment* refers to the equipment, work-life balance, a clear idea of what is expected, etc. *Appreciation* refers to respect shown by parents, friends, skills, etc. *Emotion* includes enjoying the work, interest in the job, its stimulating nature, etc. (EDENRED-IPSOS, 2016).

you. Where on the ladder do you personally feel you stand [*at the present time, three years ago, and one year ago*]? [Show the picture of ladder (RECORD STEP NUMBER 01-09)]

The answer to this question takes discrete values from 1 to 9. I then convert these scales into an ordinal scale of 5, with 5 indicating the highest level of well-being and 1 indicating the lowest level of well-being. I refer to these ordinal measures as subjective well-being (SWB). This approach has been widely used in the psychology literature and recently frequently used in economics literature (Easterlin, 1974, 1999; Ferrer-i-Carbonell and Frijters, 2004; Ferrer-i-Carbonell, 2005; Akay et al., 2012). Ferrer-i-Carbonell (2002) indicates that the use of this approach is based on three important assumptions: i) willingness and the ability of individuals to answer well-being questions; ii) that SWB is linked with the economic concept of welfare, and iii) the possibility of interpersonal comparability at an ordinal level. For instance, an individual whose SWB is say 5 is better off (happier) than one with a SWB of 3.

The second option of measuring SWB (option 2) is constructed from the sum of 17 different questions of Edinred-Ipsos Barometer. Each individual was asked 17 questions rated on a scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”) (11 questions), and 0 (“no”) to 1 (“yes”) (6 questions); hence the lowest score is 11 and the highest is 71 (see Appendix Table A3.2 for the list of questions used). I sum up the responses of these 17 questions and categorized into 5 ordinal scales. The scores are arranged in order so that the highest scores indicating higher well-being. For instance, one of the 17 questions addressed to respondents run in the following manner:

You feel proud to show your friends or other visitors where you live. You are proud of the work you are doing. The responses would be from 1 strongly disagree to 5 strongly agree.

As a practice, also in the literature, I interpret the measure as a proxy for the latent utility (Clark et al., 2008; Akay et al., 2012). Our empirical analysis reported below is mainly based on the self-reported measure of well-being computed using option 1, and use the alternative approach (option 2) as a robustness check (results reported in Appendix Table A3.4). The distribution of the SWB for youth sample are reported in figure 3.1 and the resulting reports of summary statistics of selected variables for the whole sample used in the analysis is presented in Table 3.7. In terms of gender, SWB is higher for male youth than female youth (figure 3.2).

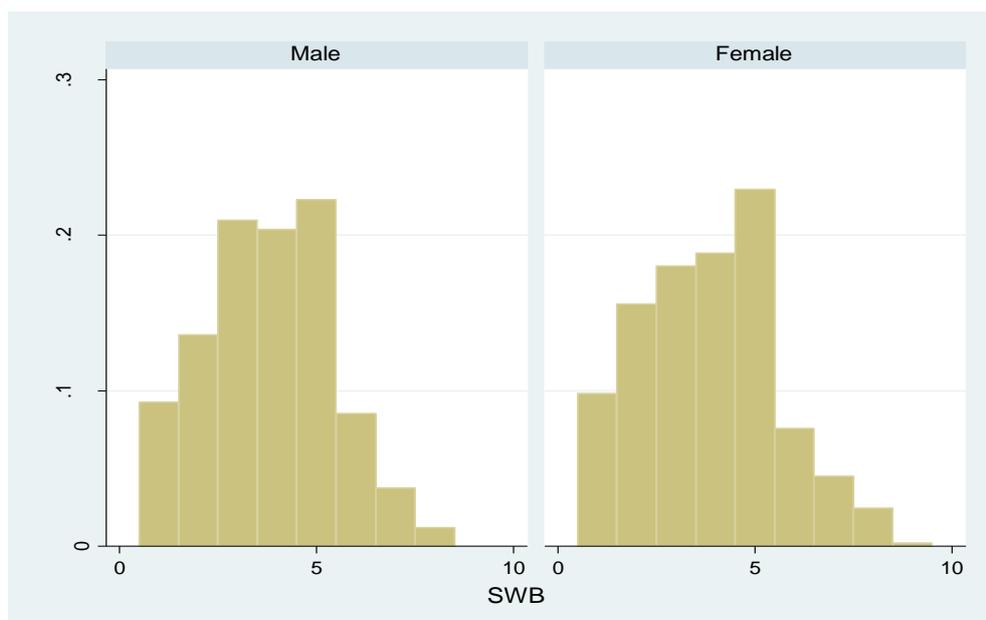


Figure 3.1: Distribution of youth subjective well-being by gender. Note that SWB is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life).

In the following section, I present the descriptive results.

3.4. Characteristics of subjects and their attitudes toward positionality

As indicated earlier, the focus in our empirical estimation is to understand whether fathers' and mothers' attitudes towards positionality and youth's own positional concerns matter for the well-being of youth members (proxied by youth's self-reported life satisfaction). I also examine if the existence of heterogeneity in preferences towards such concern for positionality relates to intra-household allocation of resources in ways crucial to the development of youth. I start our analysis by presenting the descriptive results of the characteristics of our respondents followed by the presentation of the mean marginal degree of positionality of youth and their parents.

3.4.1. General description of respondents: youth, fathers and mothers

Table 3.1 summarizes the basic characteristics of our sample. The average age of youth, father and mother participants are about 21, 53 and 46 years, respectively. About 63% of youth respondents are male and about 70 % live with their parents (as household members). The average years of education (measured as the average number of years of schooling completed) for youth sample are about 4.2 years while it is 1.8 and 1.0 years for fathers and mothers, respectively. As expected, youth are more educated than their fathers are, who themselves are more educated than mothers are. Moreover, about 49% of youth engage in agriculture as full-time farmers and 64% are single. The average birth order in our youth sample is about 3 whereas the average family size is about 6 persons per household, which is also the same as the average household size for the national regional state.

Table 3.1: Characteristics of youth and their parents

	Youth [n=659]	Father (n=291)	Mother (n=341)
Average age in years	21.44	53.00	46.00
Gender (%)			
Male	62.97	-	-
Female	37.03	-	-
Years of education	4.20	1.80	1.00
Marital status (%)			
Single	63.79	-	-
Married(single spouse)	36.21	89.53	60.05
Other	-	5.40	39.35
Family size	6.00	6.00	6.0
Farm size per capita(ha)	0.53	0.53	0.53
Birth order	3.00	-	-
Occupation (main) (%)			
Part-time/ student/domestic worker	48.48	-	50.88
Full-time farmer	48.64	96.53	46.17
Non-farm worker	2.88	3.47	3.05
Youth type (%)			
Household head	30.00	-	-
Member(live with parents)	70.00	-	-

Source: survey results

Note: Other include-widow, divorced, not together for any reason, married more than one spouse.

3.4.2. Descriptive results from the survey experiments

Using equation (3.3), Table 3.2 presents a summary²¹ of the experiment. Forty-four percent of youth respondents have a degree of positionality less than 0.1; while it is 63 and 61 percent, respectively for father and mother subjects. Overall, the distributions of the responses are almost identical for fathers and mothers. The mean degree of positionality²² is 0.30, 0.26, and 0.24 for youth, fathers, and mothers, respectively while the calculated median degree of positionality was 0.2 for youth and 0.1 for fathers and mothers. This indicates that youth are more positional than their parents do. In addition, the results indicate that the marginal degree of positionality for fathers' and mothers' is relatively lower than youth interval but higher than the one estimated by Akay and Martinsson (2011) and Akay et al. (2012a; 2014), who find very low positionality estimates (0.17) in rural areas of Northern Ethiopia. Our estimates are also higher than ones found in developing countries are. Akay and Martinsson (2012) find no or low positional concerns among Swedish young people though the level of concerns for income increases gradually and significantly with age among Swedish adults. As expected, participants in our study were younger (21 years age compared to the Akay and Martinsson (2012) sample average of 44 years) and more educated (4.2 years of schooling compared to their average of 1.2 of years among household heads). Gender wise, female youth are more positional than male youth (Table A3). The results obtained from the experimental data support the hypothesis that there is heterogeneity of

²¹ The marginal degree of positional concerns with the ratio comparison utility function for this scenario took the values of 0.0110, 0.224, 0.345, 0.471, and 0.605 and 0.746.

²² The average marginal degree using the ration comparison utility function is 0.33, 0.31 and 0.29 for youth, fathers and mothers, respectively. Reference group is youth of similar age living in the same society or village.

positional concerns among household members and youth population are more positional than mature/adult population group. The difference between youth and parents' concerns about positionality is partly related to the higher value that youth assign to their relative standing than their parents.

One of the reasons why respondents chose to live in society A, where the subject's monthly income is lower than the average income, is that upward comparisons serve as a motivation (incentive) to work hard and hence, a signal for future prospects. A careful compilation of the qualitative responses provided by subjects also indicates that choosing society A does not mean less preference for positionality. As Clark and Oswald (1998), also point out the participant may have positional concern and yet may behave as though they do not. Stark (2006) also argues that inequality of wealth prompts an individual's want of social status that in turn fosters the accumulation of wealth; a point I will explore more in a subsequent chapter.

Table 3.2: Results of the experiment using additive comparison utility function

Alternatives	Marginal degree of positional concern (if indifferent between village A and Bi)	Frequencies		
		Youth	Father	Mother*
Alternative A	$\gamma < 0.10$	290(43.85)	129(62.93)	196(61.28)
Alternative B1	$0.10 \leq \gamma < 0.20$	132(20)	1(0.01)	44(13.78)
Alternative B2	$0.20 \leq \gamma < 0.30$	23(3.49)	3(1.46)	14(4.28)
Alternative B3	$0.30 \leq \gamma < 0.40$	27(4.10)	5(2.44)	4(1.19)
Alternative B4	$0.4 \leq \gamma < 0.50$	47(7.13)	39(19.01)	3(0.95)
Alternative B5	$0.50 \leq \gamma < 0.60$	12(1.82)	2(0.10)	4(1.19)
Alternative B6	$\gamma \geq 0.60$	129(19.55)	26(12.68)	55 (17.34)
Total		659(100)	291(100)	341(100)

Source: Survey experiment. Figures in parentheses are percentages.

I further categorized the responses of positional concerns in an ordinal scale (e.g. non-positional when a subject chooses option A, somewhat positional when the subject chooses option B2; medium when subject chooses B3 and B4, and high when the subject chooses option B5 and above). Table 3.3 presents the results of the ordinal approach. Consistent with the previous findings, again I find that positional concerns are heterogeneous among the different groups within households, with youth more positional than their father and mother.

Table 3.3: Ordinal responses of respondents' concerns about positionality (in percent)

Category	Youth (n=659)	Father (n=291)	Mother (n=341)	household head (n=466)
Non positional (A)	43.93	62.0	61.28	66.74
Somewhat but not high (B2)	20	14.86	13.78	15.02
Medium (B3- B4)	7.57	3.14	5.47	3.01
High (B5 and above)	28.48	14.86	19.48	15.24
Total	100	100	100	100

Source: survey results

Figure 3.2 below presents the distribution of the marginal degree of positional concerns for the three categories of subjects (household members) disaggregating by youth groups. I find again that the distributions of the responses are similar for fathers and mothers. As shown in figure 3.1, the mean marginal degree of positionality is similar between youth members and youth head subjects. However, the mean marginal degrees of parents differ by youth category. Fathers are more positional towards youth members while mothers are more positional towards youth headed subjects.

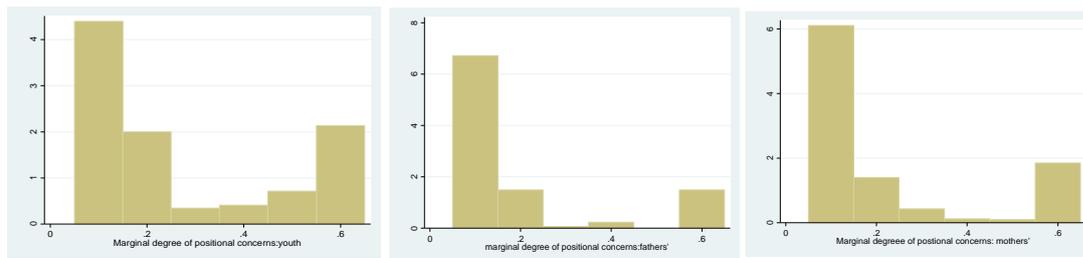


Fig 3.2: Distribution of marginal degree of positional concerns of youth, fathers and mothers: the results of experiments

To test whether the differences between the estimated degrees of positionality are statistically significant or not, I carried out chi-square tests of the difference between the distributions of answers for the youth, fathers, and mothers: χ^2 tests of the difference in the distribution of answers for parents (fathers and mothers) and for the youth. As indicated in Table 3.4 below, I can strongly reject the null hypothesis of the same underlying distributions for youth compared to fathers, on the one hand, and youth and mothers on the other. I can also reject the null hypothesis between fathers and mothers; confirming that positionality concern differs among the different age categories of household members. The same result was obtained using the distributions of ordinal measures of respondents' preferences towards positionality presented in Table 3.4.

Table 3.4: Chi-square tests of the differences in distribution of answers for youth, fathers, and mothers

	Youth	Father
Father	34.45***	
Mother	64.96***	20.40*

Source: survey results

Note Ho: Distribution of youth and fathers', and distribution of youth and mothers', and distribution of fathers and mothers' positional concerns are the same. ***, *indicates a significant difference at the 1 and 10 percent level, respectively; the critical level is 19 (the critical level at the 10 percent level is 19) with 15 degrees of freedom.

3.4.3. Relationship between positionality and subjective well-being

Mean marginal degree of positional concern is highest among the richest (the 5th quantile income group) for the three groups (0.33 for youth, 0.20 for father and 0.27 for mothers). The mean SWB among the 5th quantile income group is 3.1 on a scale of 5 whereas SWB is about 1 among the first quantile income group. The distribution of SWB against positional concern for the youth, fathers, and mothers in our sample are reported in Table 3.5. Youth from positional fathers and mothers have a

relatively comparable income per capita and education level but have higher land per capita, TLU and have reported higher SWB. I find no significant difference in terms of other characteristics (Table 3.5). This suggests that the difference in SWB is partly attributed to more allocation of intra-household resources to youth as a result of parents' positional concerns; i.e. youth from positional parents are more likely to share more household resources, better supported, more likely to continue schools and more likely to have less social stress resulting from lagging behind others (Biblarz and Stacey, 2010).

Table 3.5 Mean SWB comparisons with respect to positionality

Group	Non-positional	Positional	Mean Difference	All
SWB_wrt youth (N=659)	4.276	4.629	-0.352***	4.470
SWB_wrt father (n=284)	4.427	4.750	-0.322*	4.531
SWB_wrt mom (n=405)	4.303	4.823	-0.519***	4.506
SWB_wrt head (n=447)	4.292	4.818	-0.527***	4.467
LogPCI_wrt father	7.52	7.56	-0.04	7.53
Currstud_wrt father	0.55	0.57	-0.01	0.56

Source: survey results. Note: *** p<0.01, ** p<0.05, * p<0.1

Ho: mean (non-positional)-mean (positional) =0

SWBwrt youth denotes SWB against the positional concern of youth; SWBwrt father denotes SWB against the positional concern of father, and SWBwrt mom denotes SWB against the positional concern of the mother.

Summary of descriptive statistics of the main variables used in the regression analysis is presented in Table 3.6.

Table 3.6: Summary of descriptive statistics of the variables of interest

	Mean	Std. Dev.	Min	Max
Youth subjective well-being	2.93	1.36	1	5
Positionality concern for youth: 0 if a youth chooses society A in the first choice situation and 1 otherwise.	0.57	0.50	0	1
Positionality concern for father: 0 if a father chooses society A in the first choice situation and 1 otherwise.	0.33	0.47	0	1
Positionality concern for mother: 0 if a mother chooses society A in the first choice situation and 1 otherwise.	0.39	0.49	0	1
Sex of youth (1-female, and 0 otherwise)	0.37	0.48	0	1
Youth has mobile phone	0.53	0.50	0	1
Age of youth	21.44	5.87	15	34
Education of youth (years)	4.21	3.37	0	14
Youth is currently attending school(1, yes; 0 otherwise)	0.37	0.48	0	1
Birth order (rank)	3.35	2.33	1	14
First born is son	0.17	0.38	0	1
Age of father	52.55	12.27	29	95
Education of father (years)	2.52	3.19	0	16
Marital status of father (1=married to single spouse, 0 otherwise)	0.90	0.31	0	1
Mother relationship to head (1 if household head, 0 otherwise)	0.40	0.49	0	1
Age of mother respondent	46.76	11.79	25	90
Education of mother respondent(years)	0.79	1.79	0	9
# of male youth in the household 13-34 years	1.29	0.93	0	5
# of female youth in the household 13-34 years	1.20	0.88	0	5
Family size	7.41	3.29	2	20
Land size holding per household (in hectares)	1.89	2.29	0.1	27.3
Land size per own child (in hectares)	0.54	0.62	0.01	9.1
Total income per household (in Birr)	17440	18714	9.3	190021
Per capita income	2502	2739	1.86	27145
Number of livestock owned (TLU)	9.78	10.10	0	86.4
Materials used to construct the roof of the main house(1-corrugated metal, 0 otherwise)	0.48	0.50	0	1
The PA has access to electricity (1 yes, 0 otherwise)	0.32	0.47	0	1
The PA has access to public pipe water	0.44	0.50	0	1
Availability of youth-related projects and programs in the kebele/woreda (1 yes, 0 otherwise)	0.77	0.42	0	1
Land registration process completed in the PA (1 yes, 0 otherwise)	0.39	0.49	0	1
Rural credit and saving institutions available in the PA (1, 0)	0.46	0.50	0	1
<i>Number of observations</i>				
Youth	659			
Father	291			
Mother	341			
Household heads	466			

Source: survey results.

Note: Per capita income (PCI) is calculated by dividing the income by household size. Household heads exclude youth household heads.

In the following section, I present the estimation strategies employed in the regression analyses to explore further what factors motivate positional concerns and how might such concern for positionality affect the well-being of youth.

3.5. Empirical approach

Determinants of positionality

Before presenting the estimation procedures of the different specifications to empirically relate parents' positional concerns (and that of youth) and SWB, I first present the estimation procedure of the determinants of positional concerns among the three categories of household members. As stated earlier different factors might have motivated the positional concerns of youth subjects and their parents that include youth's own characters, fathers' and mothers' characteristics or attributes and these determinants are potentially different across the three groups of household members. The specifications used to estimate the determinants of the marginal degree of positional concerns for subject i is presented as follows:

$$m_i^s = \alpha_0 + \beta X_i + u_i \quad (3.4a)$$

$$m_i^s = \alpha_0 + \beta X_i + \theta F_i + \mu M_i + u_i \quad (3.4b)$$

Where in these specifications, m_i^s is the marginal degree of positionality of subject $i \in \{\text{youth, father, mother, household head}\}$, X_i is a linear function of subject i characteristics/attributes, F_i is father characteristics/attributes, and M_i is mother characteristics/attributes. The only difference between (3.4a) compared to (3.4b) is the father and mother attributes included in the model as the determinants of subjects marginal degree of positionality. In the case of interval regression, the dependent variable is the interval of the lower and upper bounds of the marginal degree of positional concerns. In the probit regression model, the dependent variable takes on the value of 1 if a subject doesn't choose society A in the first choice situation and 0 otherwise.

Estimating the effects of positional concerns on SWB

A common practice in literature to model the link between positional concerns and well-being is the use of relative income (relative deprivation) captured using a standard household surveys (Easterlin, 1995, 2001; Stark and Taylor, 1991; Alpizar et al., 2005, among others), a topic I will cover in detail in the next chapters. Relative income is computed from the realized income of the respondents and matched with subjective well-being. There are no adequate empirical works that capture and link intra-household positional concerns (measured experimentally) with subjective well-being. In line with this, I investigate the correlation of subjective well-being of youth with experimentally measured positional concerns of youth, fathers, mothers, and household socio-economic variables to examine whose positional concern matter most for the well-being of youth members, and examine the implications of such to intra-household resource allocation.

In this section, I outline simple econometric models that I employ in order to estimate the relationship between parents' attitudes toward positional concerns of youth members, youth's own positional

concern, and SWB. Similar to Dunbar et al. (2013), in this paper, I model that each youth is represented as having their own utility function. This means that each youth belonging to the same household is modeled as having different utility functions, assuming that preferences are different within the household (member's preferences in terms of consumption, career choices, etc) and in terms of preferences of fathers and mothers towards the youth under consideration. For instance, firstborn may be more favored by fathers; hence, fathers may be more positional toward that youth which would eventually affect the resource allocation/investment preferences within households in terms of improving the relative standing of that particular youth. This, in turn, affects the life satisfaction of youth. The same is true for mothers. Therefore, the marginal degree of positional concern of youth as well as the marginal degree of positional concerns of parents, and its subsequent effect on the life satisfaction of youth is modeled in a systematic approach. The key features of our approach are that it allows the capturing of the different factors motivating positional concerns of the different groups within a household and then relating these roles to the well-being of youth members. As such I specify and estimate the models in which a SWB measure, as reported by youth subjects, is regressed on youth marginal degree of positional concern, and the marginal degree of positional concerns of parents (fathers, mothers and household head), controlling for other relevant variables affecting youth well-being. I expect a significant positive correlation between the marginal degree of positional concerns of the three groups of household members and SWB of youth if concern for positionality induces well-being.

The novelty of this approach is that it not only captures within a household heterogeneity and the effect on life satisfaction of youth but also helps to investigate how concerns about status could vary across the different age intervals. This systematic approach enables us to model the nexus between the well-being of youth household members and parents' positional concerns of offspring using experimental survey. As outlined earlier, our outcome variable, i.e. youth SWB is being measured in an ordinal scale, suggesting that the appropriate model of the specification under such condition would be an ordered probit or logit model. However, I prefer our specification in a linear regression model and present the model results from an ordered probit model. I outline the description of the ordered model specifications in appendix A3.4. Linear specifications of the relationship between parents' and youth's own concerns about positionalities, and SWB of youth are specified as follows:

$$SWB_{(i,h)}^* = \alpha_0 + \alpha_y \gamma_y + \sigma Y_h + \beta Z_i + u_i \quad (3.5a)$$

$$SWB_{(i,h)}^* = \alpha_0 + \alpha_y \gamma_y + \alpha_f \gamma_f + \alpha_m \gamma_m + \sigma Y_h + \beta Z_i + u_i \quad (3.5b)$$

$$SWB_{(i,h)}^* = \alpha_0 + \alpha_y \gamma_y + \alpha_{hh} \gamma_{hh} + \sigma Y_h + \beta X_i + u_i \quad (3.5c)$$

Where in these equations, SWB_i^* is the self-reported SWB of youth i who is a member of household h reported on an ordinal scale (measured either using the life satisfaction measure of Likert scale or using

the general Edenred-Ipsos Barometer described previously); (γ_y) , γ_f , γ_m and γ_{hh} denote the marginal degree of positional concerns of youth, father, mother and household head, respectively. As stated earlier, in the empirical results reported in the appendix of this thesis, I convert marginal degree of positional concerns of the different groups into binary variable that equals one if the subjects choose society B_i in the first choice and zero otherwise. Y_h is absolute income of a household h youth belong to; Z_i is a set of controls including youth and parents' attributes deemed to affect SWB of youth and u is the error term. Z_i also include potential determinants of SWB as often used in the literature including household, local institutions and community characteristics. The individual level characteristics/attributes of youth include age, gender, education, birth rank, current occupation of the youth-whether the youth is a student or full-time farmer, and youth marital status (member or head).

The household factors are categorized into father related factors (such as age, education, marital status), mother related factors (age, education, marital status, relationship to household head) and other factors common to the household (which includes land holdings, livestock holding, income, housing facilities, access to potable water and demographics). In addition, community characteristics such as availability of youth-related development projects in the district, availability of electricity, land registration, access to saving and credit institutions. Furthermore, district dummies are included to control for variations (such as infrastructure, information etc.) at the district level.

The difference between (3.5a), (3.5b) and (3.5c) specification is that (3.5a) is the specification which includes youth own marginal degree of positional concern and own individual characteristics as well as own family assets (part of X but excluding father and mother characteristics/attributes, and separately estimated based on youth type) as a determinant of youth SWB. These are the first set of specifications that I will present in the empirical analysis. A second specification (3.5b) will add positional concerns of fathers and mothers as well as their individual characteristics (attributes) such as age, education and their relationship or role in the household only to the first specification. Finally, (3.5c) estimate specifications I add status concerns' of household heads and their attributes to the first specification. This specification is based on the assumption that resources are pooled and allocated according to household members need (i.e. household members are homogenous). In addition, this specification serves as a comparison model if head characteristics/attributes are used instead of father and mother attributes. It also serves as a sensitivity analysis of the relevance of the choice of parental variables. In this model, I specify that X , includes own individual characteristics and the characteristics of the household head, besides the household assets (including family income) and community characteristics.

As stated earlier, though the sign of coefficients cannot be determined a priori, I expect that the signs of the coefficients of the marginal degree of positional concerns to be positive ($\alpha_y > 0$; $\alpha_f > 0$; $\alpha_m > 0$; $\alpha_{hh} > 0$). This means the more parents' are positional, the happier is the youth, because of the reasons outlined earlier. In other words, the higher the marginal degree of positional concerns of

parents, the higher the son (s)/daughter(s) SWB living in Bi society, i.e. in society where income difference is less (less inequality). It can also be interpreted in such a way that subjects use the higher income of the peers (comparison groups) as a signal effect (reported during focus group discussions) in the sense that it is an indication of future earnings or prospects. If the coefficients are negative and significant it means that parents put more weight to absolute income more than to relative income for the well-being of youth. Put differently, parents' put less weight to positional concerns (status) of youth. In this case relative income (or status concerns) comprises the smaller portion of utility of youth from parents' perspective. It also means that parents prefer their sons/daughters to earn more income in absolute terms, irrespective of the income of others. I anticipate that family income is positively related to well-being. Furthermore, I carryout series of robustness checks to complement the findings of our results, based on different specifications to Eq (3.5a-3.5c). Results are reported in appendix A3.7-A3.8. I now present the econometric results of the different specifications.

3.6. Econometric results and discussions

3.6.1. Factors influencing positional concerns

Before relating parents' positional concerns estimated from the specifications to SWB of youth, which is the focus of this paper, I analyze first factors influencing the marginal degree of positionality explained by socio-demographic, economic, and other institutional characteristics for the three groups of household members, separately. In other words, I explore first what explains concerns about positionality among youth and parents. Table 3.8 presents the results of the estimates of the form of Eq (3.4a and 3.4b). I present here the results of the interval regression specification. The results of the probit model and a separate regression for sons and daughters are presented in Appendix Table A3.5 and A3.6

Factors motivating youth positional concerns

The marginal degrees of positionality among subjects are explained by several factors and the factors explaining the variations differ across the groups. For instance, results of the first specification (without controlling for fathers' and mothers' characteristics) (column 2), show that youth ownership of mobile phones, being currently a student, number of female youth members and mature in the household and access to public water are found to explain the marginal degree of positionality of youth. Youth subjects who have no mobile phones are more positional than youth subjects who have mobile phones.

Separate estimates of the determinants of positional concerns for youth members who live with their parents and youth-headed (column 3 and 4) indicate that factors explaining the degree of positionality of the two subjects differ. Whereas number of female youth members, mature members, farm size per own child and income per capita have significant effect on youth member subjects' marginal degree of positional concern; none of these variables are found to have significant effects on the marginal degree of positional concerns of youth who are household head except for number of female youth members

in the household. However, accessibility to public pipe water has a significant effect on the marginal degree of positional concern of youth who are household head. Youth household head who have no access to public pipe water is more positional than those who have access to public pipe water. Interestingly, the number of female youth members in the household has opposite effect on the marginal degree of positionality for youth members and youth household head. While this variable has a negative effect on youth who live with their parents, it has a positive effect on youth household head subjects.

I further control for various fathers' and mothers' characteristics including age, education, marital status of fathers and mothers while for mothers' I control also for mothers' relationship to head (column 5 based on Eq.3.4b). Once I control for these variables, I find that being first born child, having separate cash income apart from household income, the age of mother, education of mother, family size per own child and land size per own children turn to be significant. Interestingly, first-born youth are more positional than second and above-born youth. However, income per capita becomes insignificant in influencing preferences for positional concerns, once father and mother characteristics are controlled for.

Surprisingly, demographic variables are not significant in explaining youth's own marginal degree of positionality, unless I control for father and mother attributes. The educational level of mothers have a significant effect on the positional concerns of youth, i.e. youth subjects from educated mothers²³ are more positional than youth subjects from uneducated mothers. One of the most important assets in rural areas is landholding. Controlling for household characteristics, I find that, increasing land size per capita is negatively associated with youth subjects' preferences for positional concerns. Since the effect of land size per capita also depends on the expected inheritance of youth, i.e. depending on who is likely to inherit, I interact first-born child with land per capita. However, I find no significant effect of this interaction term. Further disaggregating the data set into male and female subjects, I find that the determinants for positional concerns for the two subjects are different, though there is no significant difference of the degree of positional concerns between female youth subjects and male youth subjects. For instance, factors that explain male youth subjects' positional concerns include a mobile phone, being a student, marital status of the father (married to single spouse), the age of mother, and livestock holding; whereas none of these variables have a significant effect on the marginal degree of positionality of female youth subjects. Instead, the following variables have a significant influence on the marginal

²³ I investigate further whether positionality of mothers in the household is related to their bargaining power via their human capital-education that enable households' decision to divert more resources to improve the relative standing of youth. To do so I interact education of mothers with income of household. I find that education remain positive but becomes insignificant, and the interaction between education and income of household is negative. However the effect of household income on mothers' positionality turns positive though insignificant. In addition, the effect of household education, especially mothers become significant when I analyse separately for male and female youth; suggesting that the effect of education of parents differs based on gender of youth.

degree of positional concerns of female youth subjects: having a land certificate, availability of youth-related projects and programs, mothers' education and access to pipe water. This is not surprising given the role of male youth in rural areas compared to female youth. Livestock holding and availability of youth-related projects and programs in the village have a significant effect on the marginal degree of positional concerns of both male and female youth subjects (appendices Table A3.6).

Factors motivating fathers and mothers positional concerns

Factors determining fathers' and mothers' positional concern varies. The only significant common factor between the two is the number of children under the age of 13 years. A number of children between 5 and 13 years at home has a significant influence on both fathers' and mothers' subjects degree of positional concerns towards the youth under consideration. The only youth characteristic that has a significant influence on the fathers' positional concerns is birth order. Fathers are more positional towards first-born youth whereas birth order has no significant influence on mothers' positional concerns towards youth. Separate analysis for sons and daughters indicate that birth order has a significant effect on parents' preferences for positional concerns. While fathers seem to be more positional toward first-born sons and daughters, mothers seem to be less positional for first-born sons. Interestingly, fathers are more positional for first-born daughters too; while this variable has no significant association with mothers' positional concerns for daughters (see Table A3.6). The only youth characteristics that have a significant association with mothers' preferences are the marital status of youth, which is not the case for fathers. During the focus group discussions held, I also learned that mothers are more positional towards married sons and daughters compared to unmarried youth.

Another important factors influencing the degree of positionality of fathers towards youth include mobile phone ownership by youth, the total number of male youth in the household, the total number of female youth in the household, male adult, female adult, and land size per own children. For instance, land per own child has a significant influence on fathers' preferences towards positional concerns. None of these variables has a significant influence on mothers' degree of positionality. For mothers', however, their age, their education, youth independent income sources and the presence of credit and saving institutions in the village have a significant influence on the degree of positional concern. Mothers' whose youth have access to saving and credit seem to be more positional than mothers' whose youth have no such access. Marginal degree of positionality of mothers increases with educational level of mothers' whereas it decreases with their age [i.e. the level of education of mother has a positive association with the marginal degree of positionality]

I use also household head characteristics (including household head positional concern towards a youth) to investigate whether the results could be different from the use of father and mother related characteristics in the analysis (column 7). Except for ownership of mobile phones and number of children under age of 13 years, the determinants of household heads' positional concerns towards youth

members is virtually different from that of using father and mother characteristics. For household heads the following additional variables matter for their concerns about positionality (or status) of youth members: age of youth, being first-born youth is son and age of the household head. For instance, concerns about positionality decrease as the age of youth and household head increases. Likewise, to the mothers' model, head's educational background has a positive and strong significant effect on positional concerns. Overall, the different specifications indicate that the determinants of parents' attitudes toward relative standing of youth members depend on the choice of parental variables and the specifications used. I re-estimated the whole models using the probit and logit models and got virtually similar results (see appendices Table A3.5 and A3.6). I now turn to the discussions of the link between youth's own and parents' attitudes toward positionality, and subjective well-being (life satisfaction) of youth members. I also discuss the association between parents' attributes and life satisfaction of youth.

Table 3.8: Determinants of positional concerns for youth, father, mother and head: Interval regression estimates

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All	members	Youth head	controlling for parental characteristics	Father	Mother	Head
<i>Youth characteristics</i>							
Female youth	-0.00163 (0.0278)	-0.00773 (0.0323)	0.0416 (0.0618)	-0.00927 (0.0454)	0.0162 (0.0310)	0.00100 (0.0283)	0.00392 (0.0258)
Youth has no mobile phone	0.00597 (0.0220)	0.00936 (0.0268)	-0.00396 (0.0384)	0.0108 (0.0390)	-0.0793*** (0.0257)	-0.0308 (0.0238)	-0.0759*** (0.0215)
Age	-0.0236 (0.0197)	-0.0506 (0.0344)	-0.00967 (0.0593)	-0.0323 (0.0484)	0.0393 (0.0328)	0.0121 (0.0297)	0.0239 (0.0276)
Age squared	0.0005 (-0.004)	0.0012 (-0.0008)	0.0002 (-0.0011)	0.0007 (-0.0011)	-0.0010 (-0.0008)	-0.0003 (-0.0007)	-0.0007 (-0.0006)
Education(years)	0.00182 (0.00353)	0.00654 (0.00447)	-0.00647 (0.00599)	0.00121 (0.00615)	0.00295 (0.00424)	0.00569 (0.00389)	0.00299 (0.00359)
Currently student	0.0219 (0.0301)	0.0260 (0.0316)	0.154 (0.160)	0.0908* (0.0463)	0.0102 (0.0298)	0.0130 (0.0289)	0.00410 (0.0255)
First born	0.00818 (0.0401)	0.0281 (0.0448)	-0.0780 (0.0971)	0.116** (0.0573)	0.0723* (0.0406)	-0.0586 (0.0391)	0.0372 (0.0365)
First born son	0.0208 (0.0486)	0.00545 (0.0571)	0.0973 (0.106)	-0.0642 (0.0739)	-0.0813 (0.0503)	-0.00533 (0.0502)	-0.0725* (0.0458)
Married	0.0376 (0.0436)	0.0418 (0.0290)	0.00112 (0.0376)	0.173 (0.154)	-0.0865 (0.115)	0.214** (0.0971)	0.0007 (0.0988)
Have separate cash income	0.0260 (0.0228)	0.0463 (0.0291)	-0.00491 (0.0376)	0.0700* (0.0420)	0.0250 (0.0276)	0.0443* (0.0257)	0.0214 (0.0232)
<i>Father characteristics/attributes</i>							
Age				0.000201 (0.00281)	-0.00239* (0.00136)		
Education (years)				0.00479 (0.00580)	0.00268 (0.00400)		
Married to single spouse				0.0845 (0.0697)	0.0397 (0.0417)		
<i>Mother characteristics/attributes</i>							
Age				0.00623* (0.00341)		-0.00392*** (0.00130)	
Education(years)				0.0195* (0.0101)		0.0192*** (0.00669)	
Relationship to head(1- head, 0 otherwise)						-0.000928 (0.0376)	
<i>Head characteristics/attributes</i>							
Female-headed household							-0.0383 (0.0344)
Age							-0.0028*** (0.00106)
Education of head(years)							0.00320 (0.00398)
Married to single spouse							-0.00357 (0.0164)

<i>Table 3.8. Continued</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Youth				Father	Mother	Head
	All	members	head	controlling for parental characteristics			
<i>Household characteristics</i>							
# of male youth in the household 13-34 years	-0.0331 (0.0243)	-0.0212 (0.0276)	-0.00999 (0.0860)	0.0160 (0.0420)	0.0523* (0.0302)	-0.0361 (0.0324)	0.0273 (0.0296)
# of female youth in the household 13-34 years	-0.0631** (0.0268)	-0.0617** (0.0302)	0.26138** (0.0936)	0.00595 (0.0435)	-0.0764*** (0.0270)	0.0255 (0.0292)	-0.0356 (0.0251)
# of male mature in the household >35 years	0.00466 (0.0225)	-0.0104 (0.0243)	0.0376 (0.0823)	-0.0384 (0.0445)	-0.0735** (0.0310)	0.0322 (0.0329)	-0.0478 (0.0303)
# of female mature in the household >35 years	0.0756*** (0.0259)	0.0692** (0.0297)	0.0680 (0.0616)	-0.0160 (0.0484)	0.0455* (0.0273)	-0.0322 (0.0295)	0.0239 (0.0244)
# of children under 13 years	-0.00533 (0.0100)	-0.00670 (0.0125)	-0.0145 (0.0183)	-0.00789 (0.0190)	-0.0433*** (0.0124)	-0.0192 (0.0119)	-0.0223** (0.0109)
Household assets							
Farm size per own child(in hectares)	0.00253 (0.00520)	0.000106 (0.00601)	0.00628 (0.0120)	-0.0184** (0.00732)	-0.00901* (0.00526)	0.00903* (0.00479)	-0.000266 (0.00459)
Log(per capita income in Birr)	0.0116 (0.0121)	0.0213 (0.0154)	-0.00377 (0.0221)	-0.00256 (0.0258)	0.0140 (0.0145)	-0.0115 (0.0153)	0.00969 (0.0125)
Livestock holding (tlu)	-0.000318 (0.00128)	6.27e-05 (0.00138)	-0.00251 (0.00424)	0.00313 (0.00203)	0.00113 (0.00125)	0.000115 (0.00125)	0.000847 (0.00114)
Roof of the main house is made of corrugated iron	0.0162 (0.0242)	0.0118 (0.0299)	0.0234 (0.0413)	0.0161 (0.0444)	0.0158 (0.0297)	0.00509 (0.0266)	0.0184 (0.0244)
There is electricity in the PA	0.0167 (0.0309)	-0.00293 (0.0369)	0.0597 (0.0589)	-0.0125 (0.0546)	-0.0214 (0.0327)	-0.0655** (0.0320)	-0.0434 (0.0287)
Have no access to public pipe water	0.0853* (0.0510)	0.111 (0.0693)	0.123 (0.0799)	0.274*** (0.0935)	0.0214 (0.0688)	0.0197 (0.0576)	0.00829 (0.0545)
There is no youth related projects and programs in the PA	0.0422 (0.0374)	-0.00575 (0.0465)	0.0968 (0.0621)	0.0255 (0.0633)	0.00103 (0.0413)	0.0162 (0.0407)	-0.00323 (0.0374)
has no land certificate	0.0515 (0.0570)	0.0881 (0.0709)	-0.0390 (0.0969)	0.0717 (0.0891)	-0.0109 (0.0637)	-0.0378 (0.0611)	-0.0251 (0.0572)
Saving and credit institutions are available in the PA	0.00621 (0.0391)	-0.0533 (0.0497)	0.0902 (0.0640)	0.00520 (0.0626)	-0.0195 (0.0443)	0.167*** (0.0425)	0.0487 (0.0397)
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.140 (0.118)	0.188 (0.160)	0.0380 (0.261)	0.0226 (0.294)	0.553*** (0.170)	0.385** (0.169)	0.4943*** (0.1413)
/lnsigma	-1.404*** (0.0295)	-1.399*** (0.0374)	-1.509*** (0.0566)	-1.472*** (0.0515)	-1.730*** (0.0471)	-1.583*** (0.0399)	-1.621*** (0.0377)
Observations	638	442	196	233	284	394	443

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: survey results

Note: Dependent variable is the interval of the lower and upper bounds of the degree of positional concerns. I assign 0 for the lower bound of the first interval and 1 for the upper bound of the last interval. All standard errors in this paper are clustered at the household level. 1 Euro is about 19.5 birr. PA stands for peasant association, lower level administration. In the fathers' model: It's interesting to note that controlling for mothers attributes (age and education) affect the significance of father attributes: father age turns significant(-), education of father turns from positive to negative but insignificant. Both age and education of mother have a positive effect on fathers' attitude towards positionality; further supporting the intra-household heterogeneity and the necessity of controlling intra-household in the analyses rather than using household head characteristics. In the mothers' model, like in the fathers' model, I control for fathers attributes (age, education, and marital status). Once I control for these variables, the age of mother remains significant and negative, education of mothers turns insignificant but remains positive, land PC turns negative and significant, income PC turns into positive but insignificant. Age of father is positive and education of father is negative, both insignificant.

3.6.2. Positional concerns and subjective well-being youth

This section presents the estimation results of the form of Eq (3.5a-3.5c), considering different specifications presented earlier. In the first model (column 1) I control for youth exogenous variations (age of youth, sex, education, relationship to head, studentship status, birth rank); demographic characteristics (number of male and female youth members in the household); assets (land per capita,

income per capita, livestock holding, roof type, and districts; among others). In the second model (column 2), I report the estimates of youth member subjects, separately without controlling for parents characteristics. In the third model (column 3) presents the results of the estimates of youth household heads, separately. In the fourth model (column 4) I estimate for youth members, controlling for various father's and mother's characteristics including age, education, marital status of fathers' and mothers' while for mothers' I control also their relationship to head. In the fifth model (column 5), I control for household head characteristics as an alternative proxy to father and mother characteristics (attributes) in addition to youth own characteristics and present the results for members, as an additional comparison model and as a way of examining the role of parents in the welfare of youth. It also helps to make sure that I have captured adequately relevant variables in the model specifications reducing the possibilities of omitted variables bias. In this regard then, I check the sensitivity of our main estimates to the inclusion of parents' characteristics. In all the models, youth own marginal degree of positional concerns, fathers as well as heads marginal degree of positional concerns are positively related to youth subjective well-being and significant at 1%, 5%, 5%, respectively (column 1,3, and 5 of Table 3.9). The major discussion hereafter focuses on the coefficients of the positional concerns of youth, father and mother and I present the main results for other variables of interest here since the relationship between these variables and SWB has been widely investigated in SWB literature (see, for example, Clark and Oswald, 1994; Ferrer-i-Carbonell, 2003, 2005; Akay, 2012, 2014; among others).

Disaggregating youth by type without controlling for parents characteristics

The ordered probit model of the first specification (Eq. 3.5a) suggests that youth own positional concern is strongly positively correlated with well-being (highly significant at the 1% level). The sign and the significance of the coefficient of the marginal degree of positional concerns confirms that there is a strong correlation between youth well-being and the corresponding own marginal degree of positional concerns (status concern). These results are robust to two specifications, with members only and with youth who are household head (column 2 and 3). This means that the proportion of the total change in subjective well-being of youth that comes from an increase in relative income after a marginal increase of own income is higher among more positional youth compared to non-positional ones. In other words, the positive significant correlation between youth own positional concern and subjective well-being suggest that concerns about positionality do matter in their assessments of life satisfaction. In addition, it challenges the presumption that positional concerns have an insignificant effect on the utility of individuals in poor countries, especially among youth population groups (Akay et al., 2012). The effect of (magnitude of) positional concerns on subjective well-being is higher among youth household head compared to youth members, suggesting the important role of positional concerns as a determinant of SWB and heterogeneous effect of positional concerns among youth categories.

A positive relationship between concerns about positionality and well-being of youth can be partly interpreted as a sign of ‘*signal effect*’ or ‘*stimulus*’ i.e., a youth’s well-being is positively affected by the observation of other youth’s faster income progression if they interpret this movement as a sign that his own turn will come around soon (Hirschman, 1973; Stark, 2006). It serves them also as an indicator of prospects about their future jobs. Participants reported that reference income serves as an information to create future expectations and as an aspiration for the possibility of achieving that income level. A similar explanation has been reported in South Africa, Russia (Senik, 2004), China (Akay 2012), Eastern EU countries and US (Senik, 2008). Relative concerns may induce positive externalities as a result of living with wealthy neighborhoods such as learning new moods of production, an adaption of new varieties of crops, aspirations to work hard, etc. Compiled responses of the justifications given by respondents for choosing society A in the experiment also support this line of argument. In this case, then, the relative incomes of the reference groups serve as a stimuli or prospect indicator. I will investigate this claim in detail in the next chapter using the realized (realized) income.

The sign of the coefficients of other variables also turn out to be consistent with a priori expectations and the findings are in line with the findings in the existing literature (Akay et al., 2012; Ferrer-i-Carbonell and Van Praag, 2003; Akay et al., 2014, among others). I now discuss briefly each of the significant variables of other variables influencing SWB of youth using these specifications, before presenting the relationship between parents’ marginal degree of positional concerns (a proxy for parents’ concern for status) and youth SWB. Youth who do not have mobile phones have lower levels of well-being compared to those who own mobile phones. Contrary to the previous studies who have documented the existence of U-shape relationship between age and SWB (Akay et al., 2013, 2014), I find an inverted U-shape relationship between two. This is not surprising and expected given the fact that our sample is youth age groups, i.e. well-being of youth increases as the age increases in the early age of their livelihood and decreases as they get older.

Being enrolled in school is associated with higher well-being. In the benchmark model, birth order (both birth rank as well as being a first-born is son) is found to be insignificant, though the coefficient is positive. However, being the first-born son becomes significant for youth who are household heads, when I separately analyze for members and household head. Land per own child is positively correlated with the well-being of youth (similar to what is documented by Bezu, 2014; Akay et al., 2014) but insignificant across all the three benchmark models. All these variables turn out to be significantly associated with SWB, when SWB is constructed from the 17 different questions of Edenred-Ipsos Barometer. Income per capita and livestock holding is positively and significantly associated with subjective well-being. This is consistent with the existing empirical evidence (Ravallion and Lokshin, 2010; Wilkinson and Pickett, 2007). With regard to housing facilities, youth whose roof of a house is constructed with corrugated iron have a higher well-being compared to those whose roof is made of

other materials. The absence of public pipe water in kebele is associated with lower well-being across the three specifications (the highest negative effect for youth household heads).

Because of youth exposure to different information, youth may perceive that concerns about positionality are an important component of their well-being than their parents believe. This could perhaps reflect that youth are more equality and socially oriented and/or responsive to inequality among peers, hence their perception of well-being is more closely related to other people's (or their peers) income or wealth, including other people's prestige (social standing).

For youth who are household heads, the magnitudes of the estimates outlined above are larger than the one for members. The sign of the estimates is also identical for almost all variables except for being currently studying. Controlling for other factors, youth head subjects who are currently studying are having less well-being than those who are no longer students. This would be probably because of the fact that once youth become household heads, an increase in educational achievement (pursuing education) would not increase one's expectation of success in rural areas.

Parents' positional concerns and well-being of the rural youth

In the following section, I examine whether parents' concerns about positionality of sons/daughters affect the well-being of youth. I explore this by adding a marginal degree of positional concerns of fathers' and mothers' to the benchmark specification (column 4 of Table 3.9). When I do so and control for fathers and mothers characteristics, youth own marginal degree of positional concern remains positively and significantly associated with SWB. Interestingly, the size of estimated coefficient has increased (from 0.45 to 0.56). As explained earlier, this suggests that quest for status among youth induces aspirations/motivation to work hard which in turn foster accumulation of assets, hence higher life satisfaction. However, I have to be cautious in interpretations that still higher or extreme income disparity may lead to frustration that in turn lower life satisfaction.

Of parents' concern for status (fathers and mothers), fathers' concern for status is highly and significantly associated with youth SWB, even higher than the effect of youth's own status concern. Youth from positional fathers are associated with higher well-being compared to those with less positional fathers. As stated earlier in the descriptive results, there could be several factors at play. One possible justification is that parents who are more positional (those who are more concerned about the relative status of their sons/daughters) invest more on their offspring in order to improve the relative standing of youth compared to less positional parents. This is also partly reflected with the strong and significant positive association between youth SWB and per capita income. The other justification could be the altruistic behavior of parents towards their children. This is also likely in rural areas where there is strong social capital that complements (or eases) the stress resulting from relative concerns.

It would suggest also centralized motives between youth and parents, as a youth would later expect to take care of their parents in the way that today's investment on youth would be repaid later in the form of taking care of parents. Though mothers' are more positional than fathers are, I find no significant association with the life satisfaction of youth. This would be partly due to their less influence or bargaining power on resource allocation decisions (recent evidence shows that spouse have weak intra-household bargaining power over their husband and the main control over resource allocation and utilization is the main role of men) (Anderson et al., 2017; Wang, 2014). As a result, mothers' concerns for status would have less impact on the well-being of youth. Though the effect of mothers' concern for positionality on the well-being of youth is insignificant, the effect on well-being is revealed through their education. I investigate further whether more educated mothers' influence intra-household allocation decisions (or have stronger bargaining power) including investment on youth compared to less educated mothers. I explore this by including an interaction term between education of mothers and household income and between education of mothers and concern for positionality. I find that the interaction terms have positive though insignificant effects on SWB. However, the magnitude of the estimates of household income improves significantly suggesting the validity of our claim. Seebens and Sauer (2007) find that bargaining power associated with greater control over household resources affects the share of an individual's consumption. Basu (2006) modeled a household behavior with the endogenously determined balance of power, and show that the power balance between the husband and the wife can depend on the decisions made.

Interestingly, the inclusion of parents' concerns for status and their attributes in the specifications do substantially affect the estimates of some of the previously discussed parameters (Table 3.9, column 4). For instance, the inclusion of parents' positional concerns and their attributes such as attributes of mothers' improve the explanatory power of the models as well as the magnitude of the estimates of some variables such as birth order, the gender of the first born and per capita income. This suggests that failing to control for parents characteristics would imply an underestimation of parental effects as well as that of youth and might alter the conclusion of the results. At the same time, failure to capture parents' attributes in the analysis of well-being of youth would result in biased estimates.

Other explanatory variables affecting the well-being of youth members in addition to the ones discussed earlier using these specifications include age of the father. I find a negative and significant association between fathers' age and SWB of youth members. Being first-born sons increased the likelihood of having higher SWB than first-born daughters. This is mainly because of the fact that the lion's share of household's resource such as land and livestock is shared to first-born sons than first-born daughters. Sons in general and firstborn sons, in particular, are expected to take over family farms. Previous studies also indicate that women and girls are less likely to inherit important assets such as land from their parents, which limits their access to such resources (Bezu and Holden, 2014). In addition, social norms and culture in most rural areas favor first-born sons than daughters. When I disaggregate between sons

and daughters, I find a positive and significant association between daughter's birth order and SWB (appendix Table 2.1F). Though one would expect that first born have a higher well-being, it's equally justifiable also that the opposite could hold true. First-born children bear all the responsibilities and hardships in order to change the living condition of a household. It's the role of firstborn to share the responsibilities in the family such as looking after the younger siblings as well as their parents at older age.

An alternative estimation technique to analyze the correlation between parents' concern for status and the SWB of youth is the use of household head positional concerns and characteristics in the specifications. In doing so, I analyzed the relationship between youth SWB and parents' positional concerns using household head positional concerns, controlling for other head characteristics (Table 3.9, column 5). I find a positive and statistically significant estimate of household head's positional concern on SWB of youth; similar to the effect of fathers' positional concern. The size of the estimated coefficient is even larger than youth's own estimated coefficient. In addition, household head married to a single spouse is associated with the higher well-being of youth compared to those married to more than one spouse. Furthermore, the age of household head is negatively associated with SWB of youth. The interpretations of the estimates of the remaining parameters in this specification are the same as outlined above. I re-estimated alternative specifications using OLS models and matching techniques as well as for work satisfaction measures of SWB, and find substantially similar results²⁴, suggesting that our results are robust to different specifications and measurements.

One of the interesting things to note from the different estimation results reported in Table 3.9 is that the use of fathers', mothers' and/or household heads' characteristics, including their concerns for positionality have different effects on the life satisfaction of youth. For instance, while fathers' and household heads' marginal degree of positional concerns are positively correlated with SWB, mothers' positional concern is negatively correlated with SWB. The same is true with the effect of other parental characteristics/attributes such as education and age; suggesting intra-household heterogeneity in

²⁴ In addition to using the regression treatment effect (the standard regression techniques), the robustness of my results are re-estimated using matching techniques (estimates of the treatment impact); where positional dummy indicates treatment status, i.e. treated =1 if positional and 0 otherwise. The positional (treated) and non-positional (control) groups are reasonably comparable in terms of age, schooling, gender, families, TLU, land, per capita income. Better comparability between the two groups ensures that the matching assumptions are to some extent satisfactorily meet. Thus, I use matching techniques (nearest neighbourhood, kernel, and propensity score matching) to check further the robustness of the results. The estimation results confirm that youth or youth from positional parents have a higher well-being than non-positional youth (or youth from non-positional parents). For instance, on average, youth who are positional are $(0.332/4.276*100)=8\%$ to $(0.599/4.427*100)=14\%$ more likely happier (have higher level of life satisfaction) than non-positional youth and the difference is significant at 1%. Likewise, the effect of mothers' positional concerns on well-being is positive and significant when matching methods are used to estimate the impact.

preferences, power relations, and influences. Therefore, the choice of parental characteristics matters in the analyses of youth welfare. Note also that I use the hypothetical rural labor income across the groups in constructing marginal degree of positional concerns. However, one might argue that the effect of hypothetical rural income is not the same as realized labor income. For instance, Akay et al. (2012) find that the magnitude of relative income effect on the well-being of migrants is slightly lower when realized labor income is used in place of hypothetical rural income. As indicated in the footnote earlier, I find that the effect of mothers' positional concerns on well-being is positive and significant when matching methods are used to estimate the impact.

Table 3.9: The effect of parents' and youth's own positional concerns on the well-being youth: results from ordered probit models

VARIABLES	(1)	(2)	(3)	(4)	(5)
	Without controlling for parents characteristics:			Controlling for parents characteristics:	
	All	Members	household heads	with father and mother characteristics	with head characteristics
<i>Positional concerns</i>					
Youth marginal degree of positional concern	0.446*** (0.152)	0.311* (0.185)	0.619** (0.302)	0.550* (0.281)	0.362* (0.187)
Father marginal degree of positional concern	-	-	-	0.599** (0.300)	-
Mother marginal degree of positional concern	-	-	-	-0.0281 (0.298)	-
Head marginal degree of positional concern	-	-	-	-	0.409** (0.202)
Mean dependent variable (SWB) (control subjects)	4.276	4.278	4.273	4.23	4.291
<i>Youth characteristics</i>					
Female youth	-0.0525 (0.193)	-0.165 (0.226)	0.586 (0.445)	0.213 (0.339)	-0.0710 (0.226)
Youth has no mobile phone	-0.498*** (0.163)	-0.347* (0.198)	-0.942*** (0.318)	-0.126 (0.310)	-0.224 (0.203)
Age	0.000257 (0.0236)	0.0171 (0.0317)	0.0157 (0.0408)	0.0617 (0.0510)	0.0383 (0.0332)
Education(years)	0.00899 (0.0261)	0.0235 (0.0319)	0.0290 (0.0518)	0.0179 (0.0484)	0.0316 (0.0326)
Currently student	0.337* (0.205)	0.515** (0.227)	-1.933 (1.301)	0.724** (0.360)	0.478** (0.230)
Relationship to head(1 if member and zero otherwise)	0.488* (0.288)	-	-	0.583 (1.383)	1.314 (0.951)
Birth rank	0.0334 (0.0360)	0.0166 (0.0419)	0.0974 (0.0789)	0.163** (0.0776)	0.0823* (0.0458)
First born is son	0.381 (0.236)	0.443 (0.300)	0.784* (0.441)	0.974** (0.426)	0.648** (0.307)
Have a separate cash income	-0.111 (0.167)	0.0793 (0.211)	-0.634** (0.313)	-0.269 (0.325)	0.0753 (0.212)
<i>Father characteristics</i>					
Age				-0.0400* (0.0216)	
Education(years)				0.0102 (0.0463)	
Married to single spouse				-0.467 (0.531)	
<i>Mother characteristics</i>					
Age				0.0295 (0.0277)	
Education (years)				0.0546* (0.0352)	

Table 3.9. Continued

VARIABLES	(1) All	(2) Members	(3) household heads	(4) with father and mother characteristics	(5) with head characteristics
<i>Head characteristics</i>					
Sex					0.0345 (0.219)
Age					-0.0204** (0.00947)
Education(years)					0.00427 (0.0361)
Married to single spouse					0.307** (0.151)
<i>Household characteristics</i>					
# of male youth in the household 13-34 years	-0.0712 (0.0957)	-0.0949 (0.105)	-0.210 (0.326)	0.0518 (0.145)	-0.0473 (0.107)
# of female youth in the household 13-34 years	0.189* (0.100)	0.182* (0.109)	0.886** (0.372)	0.288* (0.168)	0.158 (0.111)
<i>Household assets</i>					
Farm size per own child(in hectares)	0.225 (0.159)	0.0481 (0.169)	0.668 (0.491)	-0.0693 (0.201)	0.168 (0.177)
Log(per capita income in Birr)	0.324*** (0.100)	0.453*** (0.126)	0.271 (0.197)	0.881*** (0.220)	0.548*** (0.132)
Livestock holding (tlu)	0.0250** (0.00975)	0.0262** (0.0107)	-0.00822 (0.0368)	-0.00387 (0.0157)	0.0141 (0.0109)
Roof of the main house is made of corrugated iron	0.279 (0.172)	-0.00774 (0.212)	0.559 (0.345)	-0.0519 (0.335)	0.0160 (0.216)
There is no electricity in the PA	-0.824*** (0.232)	-0.700** (0.276)	-1.528*** (0.510)	0.141 (0.382)	-0.402 (0.268)
Have no access to public pipe water	-0.760** (0.383)	-0.491 (0.506)	-1.460** (0.693)	-1.201* (0.718)	-0.183 (0.495)
There is no youth-related projects and programs in the PA	0.334 (0.279)	-0.142 (0.341)	1.317** (0.524)	-0.327 (0.490)	-0.0710 (0.344)
has no land certificate	0.506 (0.428)	0.448 (0.539)	1.005 (0.810)	0.352 (0.733)	0.520 (0.539)
Source water during dry seasons	0.216 (0.181)	0.615*** (0.225)	-0.573 (0.364)		
District dummies	Yes	Yes	Yes	Yes	Yes
Observations	638	442	196	291	443

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: Dependent variable, youth subjective well-being, is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life) and then categorized into 5 ordered values. Alternatively, the positional concern is converted into a dummy variable that takes a value of 1 if a respective subject chooses society Bi in the first choice and 0 if society A in the first choice; estimation results reported in Appendix Table A3.7).

3.7. Conclusions and policy implications

In this study, I have examined whether positional concerns matter for youth and their parents (specifically for fathers and mothers) and factors explaining it among rural youth in Ethiopia. I also analyzed how and in what way parents' quest for status is related to the well-being of youth members. Then, I explore implicitly whether stronger positional concerns (an increase in relative concerns) among parents increases or diverts allocation of household resources to youth members in order to improve the relative standing of the offspring which in turn fosters life satisfaction. The study also implicitly explores whether the choice of parental attributes matters for the well-being of youth. Intra-household positional concerns are computed from the survey experimental approaches addressed to the three group

of household members (fathers, mothers, and youth members) while youth well-being is computed from a self-reported measure of life satisfaction and/or work satisfaction indicators. Our study is the first attempt in explicitly studying the associations between intra-household positional concerns and household attributes, and well-being of youth members in developing countries. The findings indicate that while there are differences in concerns for positionality among parents and youth members, higher marginal degree of positional concern is observed among youth members compared to their fathers and mothers; a higher estimate than what is reported in literature in developing countries (Akay et al, 2012, 2014; Anderson, 2014). Gender wise, young women are positional than young men are. In addition, factors explaining positional concerns among the three categories of household members are different. Ownership of mobile, having separate independent income, enrolment in school and household demographic composition (number of youth, children, and adults in the household) are among the factors that motivate youth's positional concern. On the other hand, birth order and farm size per own child (for fathers only), marital status, youth ownership of separate cash income, the age of mothers and education of mothers are among factors that determine parents' positional concerns. When I use a household heads marginal degree of positionality as a proxy for parents' positional concerns, the age of youth, the gender of first-born and age of the household heads are found to determine positional concerns of parents. Overall, the results indicate that factors determining youth's own positional concerns and parents' positional concerns differ significantly; though similarity exists between youth and mothers.

It is interesting to note that parents' and youth's concern for positionality and their attributes determine youth well-being independently and significantly. I find a strong significant correlation between youth well-being and parents' positional concerns. The magnitudes of correlation vary with the socio-economic characteristics of youth, parents, institutional norms, and youth gender. Fathers' positional concerns have a stronger effect on the well-being of youth than youth's and mothers' positional concerns. In addition, I find that the effect of fathers and mothers' positional concerns on SWB of youth is heterogeneous. If I use household heads' as a proxy and alternative to parents' positional concern in the specifications, household heads' positional concern has also the positive and significant effect on the well-being of youth but the effect is less than youth's own positional concerns. The results are robust to different specifications of the utility function and measurement types. Though mothers' are more positional than fathers, I find no significant association with the life satisfaction of youth. This would be probably due to their less influence over within-household resource allocation. This line of thinking is further supported by the strong positive effect of mothers' education on the well-being of youth members (where more educated mothers' have a stronger effect on well-being than non-educated mothers). The inclusion of interaction term between education of mothers and households income in the model as well as estimation results using matching methods also suggest this.

Youth from positional fathers are associated with higher well-being compared to those with less positional fathers. There could be several factors at play. One possible explanation is that parents who are positional (those who are more concerned about the relative standing of the offspring) invest more on their children compared to less positional parents; also reflected with the strong and significant positive association between youth life satisfaction and per capita income. The other justification could be the altruistic behavior of parents towards their children. It would probably suggest also contractual motives between youth members and parents—investment on offspring would be repaid later in the form of taking care of parents. The more families make their children happier by reducing the feelings of the relative concerns (i.e. the more parents pay attention to their children’s psychological well-being), the more their children are creative, productive, and innovative, hence improving long-term welfare outcomes. In addition, our findings suggest that the inclusion of parents’ positional concerns and mothers’ attributes improve the explanatory power as well as the magnitude of the estimates. This clearly suggests that failure to capture parents’ attributes in the analyses of well-being of youth would result in biased estimate that has misleading policy implications. The positive impact of relative income deprivation on SWB, to be presented in the next chapter, also suggests this. Our results also challenge the presumption that positional concern does not matter in poor societies, at least among the younger generation, and low marginal degree of positionality among parents does not necessarily reflect the irrelevance of positional concerns. In addition, it challenges the unitary models that there is no heterogeneity of preferences within households. Rather the result posits that the presence of heterogeneous preferences of individuals within households has paramount implications for within household resource allocations, utilization, and youth welfare. Most importantly, our findings underscore the implications of heterogeneity of parents’ preferences toward positional concerns that would affect the well-being of household members suggesting that interventions targeting youth should also consider intra-household heterogeneity and within household resource distributional issues.

I believe that our results would also contribute to the growing evidence that quest for the status matter in low-income countries that might affect within household resource distribution as well as a source of motivation that in turn fosters well-being. Especially, the findings shed light on the importance of relative concerns for SSA countries where the population is dominated by the young generation. Our study also provides interesting policy implications (i.e. as inputs into public resource allocation decisions regarding efforts to improve youth development outcomes) in designing incentives and implementation of projects such as agricultural technologies and access to financial resources targeting youth development and participation in agriculture. It’s evident that more work has to be done on how the quest for status among parents and household members would affect and shape intra-household resource allocation/distribution and the possible pathways through which quest for status may affect economic growth. In the next chapter, I explore more in detail how relative concerns might affect youth decisions and behaviors, and their occupational choices, with implications on well-being.

4. RELATIVE DEPRIVATION IN INCOME, ASSETS AND SOCIAL CAPITAL: MOTIVATIONAL AND DETERRENT IMPACTS ON THE WELL-BEING OF RURAL YOUTH IN ETHIOPIA

Abstract

Relative income concern (or relative deprivation) is one mechanism through which income or wealth inequality is hypothesized to affect human behavior, with consequences on well-being. The study checks these effects against multiple self-identified reference groups using a unique rich panel data set from Ethiopia, enabling us to examine a broader range of questions related to youth well-being than in previous studies in developing countries. In doing so, the study extends the standard analysis of relative deprivation (RD) from income per se, to consider social RD as well as assets (non-monetary) RD. Since the effects of RD on well-being are also sensitive to the kind of measurements employed, the thesis employs two measurements of RD: objective and subjective and compare the results from both. Objective measures of RD is based on the Yitzhaki Index defined as the cumulative difference between the income, non-income and social capital of an individual and that of all those with greater incomes, non-incomes and social capital within a reference group, respectively. Subjective measures of RD is defined as an individual's self-reported assessments of social status or rank based on the three dimensions in comparison to his or her reference group(s). Evidence from random-effects ordered logistic regression and fixed effects models suggest that while income RD has a motivational impact (resulting from a "positive externality" or "signal effect"), assets and social capital RD has a deterrent impact (resulting from a status effect) on the well-being of youth. A "signal effect" or a "positive externality" - higher income of others in the reference group indicate higher prospects for youth (that induce motivation), though this varies male to female youth. Our findings are robust to different specifications and use of multiple reference groups. Overall, the thesis suggests that confining RD to the monetary sphere may be misleading and doing does not capture the real effects of RD on the well-being. Our findings have implications for poverty reduction and highlight positive externalities from economic (income) gains to peers.

Keywords: objective relative deprivation, subjective relative deprivation, income, non-income, social capital, subjective well-being, rural youth, Ethiopia

4.1. Introduction

Deprivation is often referred as lack of welfare and is understood in terms of both material goods and non-material resources but equally applicable to psychological factors (Adjaye-Gbewonyo and Kawachi, 2012). Deprivation can be conceptualized in both absolute and relative terms. While the effect of the former is often researched in developing countries, the effect of the latter is less investigated, especially with respect to a young population group. Relative deprivation involves an explicit social comparison that has consequences on an individual or household well-being such as life satisfaction and health. This paper investigates both the material and psychological effects of relative deprivation on youth well-being.

Extensive research carried out in developed countries has shown that relative deprivation affects individual well-being and behavior, and this has been recognized since the time of Adam Smith (Alpizar

et al., 2005). More recently, this analysis has extended to empirically testing the importance of both subjective (stated) and objective (revealed) relative deprivation (Easterlin, 1995; Clark et al., 2008; Akay and Martinsson, 2011). Existing literature on relative deprivation focuses on the adult or mature population. Pingle and Mitchell (2002) report those who are younger and more competitive more likely exhibit relative income in the US. Using data from the German Socioeconomic Panel Study (SOEP), Friehe et al (2014) find that relative income decrease with age. Similarly, Dahlin et al (2014) find that income comparisons are less important among older individuals. Adolescents are more likely to engage in risky behaviors than adults are, and emerging empirical evidence shows that peer influence can increase risk-taking behaviors (Gardner and Steinberg, 2005).

Relative deprivation may affect the well-being of people in general and youth in particular in several ways. First, “well being is maximized when people live under conditions that mimic those under which humans evolved” (Chen, 2015: 3). For instance, hunter-gatherer societies punished those who deviated from customary practices of equal sharing of food (Deaton, 2001). Second, studies have shown that relative deprivation undermines the protective role of the biochemical system of stress response against a wide range of human diseases (Salti, 2010; Elgar et al., 2016; Subramanyam et al., 2009). Third, rank, rather than absolute possession of resources (money) itself, may determine power and access to (exclusion of) material goods and services (Eibnar and Evans, 2005). A good example here is the occupational status, which may determine the degree of control people have over others. Fourth, empirical evidence has shown that relative deprivation affects health and happiness - the two most common indicators of well-being (Kondo et al., 2008; Subramanyam et al., 2009). Finally, relative deprivation can foster life satisfaction by promoting a stronger pursuit for status. As Stark (2004) indicates, increase in inequality of wealth prompts a stronger quest for status that in turn fosters the accumulation of wealth. Thus, such feelings of relative deprivation diminish or enhance individual’s wellbeing. Youth population groups are usually responsive to such feelings of relative deprivation. Such behavioral responses as competing for higher status, as indicated by the results from the experimental approach presented earlier, often force individuals to shift their allocation of resources from meeting basic needs to the purchase of positional goods such as mobile phones or expensive clothes, even though their absolute income remains low. It may also induce individuals to work hard in order to achieve the higher living standard, which others in the reference groups have achieved.

Despite increasing research on relative deprivation, four issues remain unclear in the literature that tests the relative deprivation hypothesis in relation to well-being. First, the choice of objects of comparison which individuals or groups use to compare their life conditions against their reference groups are not standard (whether income, consumption, wealth, housing facilities, social capital, or political connections is a good object of relative comparison or not to capture the likely impact of relative deprivation on well-being). Second, the choice of reference groups (whether to use geographic proximity, demographic characteristics or economic reference groups) are often determined by the

researcher. Third, efforts to establish stronger causal designs that require longitudinal studies with careful control for confounding by an individual or household income and other indicators of socioeconomic position are limited. Finally, there is inadequate research to advance innovative approaches to operationalize the measurement of relative deprivation including the measurement of RD in dimensions other than income (Adjaye-Gbewonyo and Kawachi, 2012). To our surprise, the existing literature in economics relies on a limited measure of relative deprivation based on income, mainly ‘unidimensional’ measure of relative deprivation (RD), where individuals, households or groups are said to be deprived of all income above their income. There are limited empirical works that compare and test the effects of subjective and objective measures of RD (including measures of relative deprivation in dimensions) on well-being, with implications on poverty reduction. The subjective approach has been widely covered in other disciplines such as sociology or anthropology though (Runciman, 1966; Goerke and Pannenberg, 2015). The objective measurement approach widely used in economics literature uses income as an object of social comparison to test the relative deprivation hypothesis while explicitly or implicitly assuming individuals compare themselves with individuals within the same reference group (comparison groups) (Yitzhaki, 1979; Stark and Taylor, 1991; Stark et al., 2009; Alpizar et al 2005; Elgar et al., 2016).

Modelling the causal link between relative deprivation and outcome variables of interest such as well-being has not been an easy task. Different methods and approaches have been adopted to measure and link relative deprivation and well-being (Yitzhaki, 1979; Deaton, 2001; Wildman, 2003; Li and Zhu, 2006; Salti, 2010). Each method and approaches has its own advantages and disadvantages. Put differently, the definition of relative deprivation in the analyses of SWB is also another source of variations. Literature defines relative deprivation in several ways: i) share of income over mean income (ratio) (e.g. Duesenberg and Persson, 1995), ii) distance of individual income from mean income (Akerlof, 1997), and iii) income rank (e.g. Frank, 1985). Others like Johansson-Stenman et al (2002) compare ratio and distance formulations of relative income and found that ‘ratio’ approach performed better than the ‘distance’ approach.

Measuring relative deprivation is not easy and an elusive issue (Adjaye-Gbewonyo and Kawachi, 2012). It is evident that the methods employed partly dictate the results. In this paper, I adopt two different methods of measuring relative deprivation: objective and subjective measures of relative deprivation by disaggregating relative deprivation along different dimensions. There are two measurement approaches to test the effect of relative deprivation on well-being, and I employ both in this paper. The first approach uses a revealed preferences approach based on survey data, employed here using subjective and objective measurement approaches. The objective approach is common in economics literature while the second approach is extensively used in sociology and anthropology literature. The second, analytical approach is based on the stated preferences theory (Johansson-Stenman et al., 2002). This approach is common in experimental economics. The detail computation and the results of the

experiments are presented in the earlier chapter. The difference between the two measures of RD, which I employ in this chapter, is that objective measures of RD (of different dimensions) are computed using the Yitzhaki index that takes into account the distances in incomes, non-income and social capital. On the other hand, subjective measures of relative deprivations are the self-reported level of individuals' relative standing in the income (or wealth) and social capital distribution of the reference groups. The subjective measures of RD can be taken as the rank or informative only of the position of individual in the income (or wealth), non-income and social capital scale. The two measurement approaches are similar in terms of analytical approaches but differ in terms of measurement, which I turn later to discuss in more detail. In this paper, the use of subjective measures (self-perceived ratings) to analyze the impact of relative concerns (relative deprivation) is distinguishable from objective approaches to relative deprivation. I explicitly model the two measurement approaches to relative deprivation and relate them to subjective well-being of youth, and compare the results of the two approaches as a robustness check. In analyzing objective and subjective RD of different dimensions, I am not only comparing the two types of approaches, rather I examine the behavior of the same subject in two different settings.

Similarly, the critical challenge in the computation of RD is the identification of the 'reference group' within which individuals and/or groups make economic and social comparisons (Subramanyam et al., 2009). The literature on this is inconclusive. It varies from individual to individual, group to group or even society to society. The common practice in existing studies is that researchers determine or assign a reference group to each individual or group (Stark and Taylor, 1991; Stark and Wong, 2000; Stark et al., 2009; Quinn, 2006; to mention a few). The choice of reference groups critically affects the outcomes and the policy implications as well shall show later in this study. In this study, I use 12 different self-reported reference groups identified through a structured questionnaire, focus group discussions and through observational experiences.

To test the effect of relative deprivation on SWB of youth, regression analyses have been used in the literature. A variety of definitions and measures of relative deprivation are used, and whether these measures are valid in terms of their correspondence to conceptualizations of RD and their ability to capture the essence of the RD hypothesis as it applies to well-being remains an open question (Adjaye-Gbewonyo and Kawachi, 2012; Salti, 2010). Objective measures used to quantify RD include Yitzhaki Index (Yitzhaki, 1979), Deaton formulation (Deaton, 2001), and other income-based measures such as log-normal formulations and percentile rank (Eibner and Evans, 2005; Li and Zhu, 2006; Subramanyam et al., 2009). In the regression analyses, relative income deprivation together with the absolute level of income, and other relevant variables, including observed and unobserved individual characteristics are used. In doing so, the sign and significance of the relative income parameter are then used as an approximation for relative deprivation among the population of interest. What is evident as a general conclusion in the literature is that the effect of relative deprivation on well-being is negative and

significant in both economic and statistical sense, which implies that relative deprivation, on average, result in welfare loss (Akay and Martinsson, 2012; Clark and Oswald, 1996; Stark, 2010; Ferreri-i-Carbonell, 2005; Clark et al., 2008, among others).

Recent evidence has shown the importance of multidimensional relative deprivation - relative deprivation that uses multiplicity of indicators or dimensions such as social capital (social relative deprivation), non-monetary indicators (such as consumption) and social capital relative deprivation) beyond the space of income or monetary approach (Barnet et al., 2004; Sweet, 2011). Incomes or monetary indicators are inadequate in themselves in capturing the prevalence and real effect of relative deprivation on well-being, especially in developing countries because of the following reasons. Firstly, income is often under-reported (understated) in most poor countries. Secondly, in rural areas, a significant portion of well-being or livelihood is derived from non-income (or non-monetary assets) and social capital such as from in-kind transfers, gifts, material possessions, household amenities and other items. For instance, Sweet (2011: 2) suggest that “because individuals may not know others' incomes, symbolic capital — the material possessions or consumption patterns one uses to display one's social status—may be a more salient basis for social comparisons.” Likewise, Barnett et al. (2004) note that it's not clear whether income alone is most relevant to individuals when they compare themselves with others. Another justification to move beyond the money metric measurement of poverty is that the poor people most commonly define poverty in terms of insecurity and capabilities, rather than low income (Barret and Carter, 2000: 36; World Bank, 2001).

Social deprivation refers to deprivation in terms of the inability to fulfill the expectations and pressure of family, neighbors and tutors, say schoolteachers, and the failure to participate in customary community events (Townsend, 1997). It's best captured by measures of social capital such as trust and cooperative relations between an individual who share a social identity, for example, ethnicity and connections with others of comparative status and power (Kawachi et al., 2004). It also points to power, social inclusion or exclusion (Von Braun and Gatzweiler, 2014) and prestige dimensions of relative deprivation. Status or relative concerns matter for welfare for the fact that status serves as a collateral in poor societies to get a loan, for instance, that translates into poverty reduction. Relative concerns also create a force or influence that affect occupational choices in order to meet certain family expectations. In some instances, aspiration for certain careers is motivated by an underlying desire to lower relative deprivation. In developing countries factors other than income such as social capital via different institutions (social networks, religion, sense of belongingness to certain community or groups of societies, etc.) is, thus, equally important for explaining changes in life satisfaction. This adds to the justification to go beyond the income sphere in the analyses of SWB.

The novelty of our research is five folds. First, I extend the standard analysis of relative concerns (or relative deprivation) to income per se and consider social relative deprivation as well as non-monetary

(non-income) relative deprivation. I investigate their effects on the life satisfaction of the rural youth. I show that strictly monetary indicators of deprivation can be misleading in terms of identifying the well-being impacts of deprivation. Second, using different types of reference groups, I show how critical the choice of reference groups can be, how it influences the robustness of the results and identifies different avenues for policy intervention. Third, I rely purely on self-reported reference groups (as opposed to assigned reference groups), thus increasing the level of information about each reference group. In other words, I rely on respondents' own classification of reference groups in defining and operationalizing relative deprivation measures, rather than our own classifications. Fourth, our paper is the first in the literature that combines these three innovations with objective and subjective measures of relative deprivation. I provide evidence that relative deprivation is a key determinant of life satisfaction for the rural youth, and show that our results are robust to the different analytical approaches. Finally, our panel data set allows us to control for omitted variable bias and confounding factors that lead to possible endogeneity.

By doing so, I close some of the gaps in the existing and inconclusive literature as well as in the lack of empirical evidence on the importance of relative concerns among young people and the relevance of multiple choice of reference groups in the analysis of subjective well-being of the rural youth. The recent studies I am aware of which have similar applications to ours are Hyll and Schneider (2014) (limited to income but used multiple reference groups), Akay and Martinsson (2011) (limited to income), Goerke and Pannenberg (2015) (limited to income) and Elgar et al (2016) (they analysed the correlation between relative deprivation and risk factors for obesity using both income and consumption indicators). Except for Akay and Martinsson (2011), all are in developed countries. Akay and Martinsson (2011) concluded that relative income has no impact on the subjective well-being of adults in rural areas of northern Ethiopia. However, as I shall argue later, their analysis treats household members as homogenous groups and their study is limited to the very poor and mature households. As indicated in the previous study, youth, father, and mother have different preferences for positional or relative concerns and their preferences have different impacts on the well-being or utility of household members, especially on youth members.

Overall, the results consistently imply that though the magnitude of relative deprivation depends on the measurement of RD employed, the reference group definitions and type of youth, the results converge that relative deprivation (of different dimensions) having statistically and economically meaningful impacts on the SWB of the rural youth. An increase in individual relative income deprivation prompts a stronger desire for hard work; that, in turn, fosters the accumulation of wealth and/or income, hence enhances life satisfaction, if the objective measurement of relative deprivation is employed. Our findings also suggest variation in the impact of relative deprivation of different dimensions on youth SWB for sons and daughters across reference groups. In addition, the effect of absolute income on SWB of male youth is consistent across the two measurement approaches employed but vary for the female

youth members; and the results are robust across various measures of relative deprivation and reference group definitions. Furthermore, the results indicate that decomposing the contributions of each RD along different dimensions would help to avoid the averaging of positive and negative income and non-income RD, and SWB relations (reduces problems of aggregation of RD). The same is true with splitting male and female youth as well as members and household head youth.

The remaining part of the paper is organized as follows. The next section will present a brief literature review focusing on objective and subjective measures of relative deprivation. Section 3 report which reference groups are perceived to be important for youth respondents. Section 4 presents the results from objective measures of relative deprivation, including the data set, empirical framework, estimation techniques, and the impact of objective relative deprivation of different dimensions on subjective well-being. I also explore a comprehensive robustness check based on multiple definitions of self-identified reference groups. In addition, the section presents the impact of relative deprivation on SWB disaggregated by gender. Section 5 presents the results from the subjective approach based on different specifications, after presenting the empirical framework, descriptions of the subjective data set and the estimation techniques employed using subjective measures. Finally, section 6 discusses the results of the two approaches and concludes. Appendices are presented at the end.

4.2. Literature review: objective and subjective measures of relative deprivation

The perception of ourselves in the social hierarchy depends on the relative notion according to which I compare ourselves to neighbors, colleagues, relatives, more generally to a "reference group". Thus, our decisions or satisfaction in life depends partly on what I see around us. As such, the social status of an individual plays an important role in the determination of well-being. Runciman (1966: 1) defines the concept of relative deprivation as: "We can roughly say that [a person] is relatively deprived of X when (i) he does not have X; (ii) he sees some other person or persons, which may include himself at some previous or expected time, as having X, (iii) he sees it as feasible that he should have X". He noted also, "The magnitude of a relative deprivation is the extent of the difference between the desired situation and that of the person desiring it." Based on Runciman, Yitzhaki (1979) operationalized the concept using income as the object of relative deprivation where individual relative deprivation is simply the sum of the gaps between the individual's or household's income or wealth and the income or wealth of all other individuals or households richer than he does. In this context, income is considered an index of the individual's ability to consume commodities.

Robson (1992:5) developed a model of decision making in which agents care not only about their relative wealth but also about their relative position in the wealth distribution. He stated, "Subjective rank in the wealth distribution enters von Neumann–Morgenstern utility as an argument in addition to wealth itself. Thus, higher wealth increases utility not only directly but also indirectly via higher status."

Pham (2005) also developed a model in which social status is positively associated with individual wealth and negatively related to the average wealth of the society.

In the literature, empirical specifications of welfare and relative deprivation have several sources of variations. These include the choice of measures to compute RD- objective (Ferrer-i-Carbonell, 2005; Oshio et al., 2011) or subjective (McBride, 2001), the functional modelling of both absolute and relative income, and the choice of control variables (McBride, 2001), determination and choice of reference groups (Ferrer-i-Carbonell, 2005; Clark et al., 2008), use of estimators to approximate RD (Ferrer-i-Carbonell and Frijters, 2004), and use of data set (cross-section vs panel data set) (Di Tella et al., 2003). Table 4.1 summarises the main empirical studies in different areas employed objective and subjective measurement of relative deprivation. Before presenting our data sources, estimation methods and the main results from the two measurement approaches to RD employed in this chapter, let us discuss first the choices and types of self-identified reference groups used in this study.

Table 4.1: Selected literature on the measurement of RD and areas of application

Authors	Reference group	Comparison	Dimension	Area of study	Method
Velben (1909)	Society	Income	Unidimensional	Economics	
Runciman (1966)	Society/community	Income	Multidimensional	Poverty	Subjective
Yitzhaki (1979)	Region/national	Income	Unidimensional	Poverty/inequality	Objective
Sen (1983)	Neighbors/community	Income	Unidimensional	Well-being/poverty	Objective
Stark and Taylor (1991)	Village	Income	Unidimensional	Migration, poverty	Objective
Quinn(2006)	Community (average income)	Income	Unidimensional	Migration	Objective
Stark et al.(2009)	Region	Income	Unidimensional	Migration	objective
Goerke and Pannenberg(2015)	Multiple reference groups (colleagues, occupation, friends, neighbors, age group, parents, partner)	Income	Unidimensional	Well-being	Subjective
Hyll and Schneider(2014)	Relatives/friends	Income	Unidimensional	Migration	Objective
Elgar et al(2016)	Schoolmate	Income, social status	Multidimensional	Health (obesity)	Objective
Subramanyam et al., 2009	multiple reference groups(17 (age, gender, race, education, state residence, and combination of the above)	Income	Unidimensional	Health (self-rated:0 excellent/very good, good and 1 if poor or fair)-poor health	Objective
Singer (1981)	Multiple reference groups(gender, education, race, geographic proximity	Income	Unidimensional	Poverty	
Akay and Martinsson(2011)	Multiple(district, community, age, land) and combination of it	Income	Unidimensional	Well-being (on very poor)	Objective
Easterlin,1997, 1995	Country	Income	Unidimensional	Well-being	Subjective
Alpizar et al 2005	Society	Income and consumption	Multidimensional	Well-being	Objective

Note: All reference groups are assigned by authors, i.e. the researcher chooses reference groups a priori. Objective means that realized income is used as the object of relative deprivation and Yitzhaki index applied to compute relative deprivation and subjective means respondents self-reported measures of intensity of comparisons (respondents are asked to report their relative deprivation). General means not specific to relative deprivation.

4.3. Relative deprivation and the choice of reference groups

The first step in the computation of relative deprivation (RD) is the determination and choice of relevant 'reference group' with whom individuals or groups make comparisons about their life situations. The concept of reference group was first explored in the 1960's in the field of social psychology (Runciman, 1966). For instance, Runciman noted that the choice of reference groups is important for the study of status concerns. Akay et al (2014) present a brief history and explanations of the different reference groups.

The most difficult task in empirical tests of the RD hypothesis is the choice or determination of reference group. What is common in economics literature is that reference groups are chosen a priori by the author(s) based on geographic proximity, demographic characteristics such as age, education, race, gender or other economic comparison groups undermining the fact that individuals do not necessarily share the same reference group (e.g. Eibner and Evans, 2005; Kondo et al., 2009; Subramanyam et al., 2009). In addition, individuals may have various simultaneous reference groups that affect their well-being in different ways. Furthermore, unlike in developed countries, the presence and reliance on informal insurance systems in low-income countries make the reference groups to be complex in structures. For instance, an income increase of others in their network either could positively or negatively affect the utility of an individual belonging to that network or reference group. Hence, the choices of reference group matters as the effect of relative deprivation vary depending on how the reference group is specified and defined. Unlike the previous surveys, this survey contains questions that ask people directly to whom they compare themselves. Like our study, I am aware of only a few studies who have employed this approach (Clark and Senik, 2010a; Senik, 2009; Knight et al., 2009; Carlsson and Qin, 2010; Carlsson et al., 2009; Mayraz et al., 2009; Akay et al., 2014). For instance, Akay et al (2014) ask how respondents perceive themselves relative to others by presenting multiple reference groups. They didn't ask about the reference groups against which people compare themselves. The insignificant effect of relative income deprivation in poor societies could be partly due to the way the reference groups are defined, and RD is measured as well as operationalized. To overcome this inherent limitations, I propose the use of multiple reference groups identified via structured questionnaire and focus group discussions (FGD) with different groups of societies such as women mature, men mature and most importantly youth, by explicitly asking respondents with whom they are more likely to compare their life situations to or socio-economic status. In other words, respondents were asked to identify their most relevant reference groups²⁵, used separately as well as in combination, to whom they make economic, social and political comparisons. The responses are summarised in Table 4.2. Following that, questions relating to subjective relative deprivation and standard life satisfaction (or dissatisfaction) against the same multiple reference groups were presented to respondents. After

²⁵ In my survey, I identify that the same individual have different reference groups based on variable of interest (this is in line with Runciman, 1966).

dictating their current standing, respondents have also requested to position themselves compared to others four years ago, three years ago, and one year ago.

This kind of approach gives respondents the freedom to make their own comparisons, thus avoiding the problem of determining which comparison groups are most important for social comparisons and consequently for well-being. A problem with this approach is that self-rating of RD may be endogenous with respect to the well-being outcome being reported. For instance, poor health condition may lead to lower self-ratings because of lower self-esteem. To overcome this problem, the presence of panel data enables us to use fixed effects that remove time-invariant characteristics. The focus group discussions held with different groups of youth, mature men and women also suggest that youth, as well as their parents, do care about relative concerns. I will examine in detail later which scope of comparison (within, upward or society-wide) matter for youth well-being as well as occupational choices. Given the observed distribution of income and consumption intensities across the reference groups, it may be of interest to know to which reference group youth and their parents compare most. Let's first discuss the different reference groups identified. Later on, for simplicity and empirical reasons, I will use mainly some of the identified reference groups for the remainder of the analyses.

Rural youth may be slightly comparable in terms of observed attributes such as age. It is not logical to assume that a youth who is 16 years old can compare himself/herself with 32 years old. Hence, I narrow down this reference group categorizing youth into similar age group (into four categories). Accordingly, I divide age brackets into 13-19, 20-24, 25-29, and older than 30. Education is divided into four different categories according to the number of years of education: illiterate to only literate, 1-6, 7-10, and more than 10 years of education. Of the socio-demographic reference groups, 88% and 58% of the youth respondents indicate similar age group and youth in the same religion as a relevant comparison group, respectively. With regard to geographic areas reference groups, 94% and 67% of youth respondents regard other youth in their village and woreda as their relevant comparison groups when they compare their economic, social, and political status with that of others, respectively. As to the economic reference groups, for instance, focusing on work-related reference group, 94% of respondents regard economic comparisons (such as the size of land holding, number of livestock holding and other youth in the same occupation) as important when they compare their socio-economic status with that of others. Since the educational infrastructure in our study areas is more or less similar, direct comparisons can be established. Hence, it may be the case that youth in rural areas, compare themselves to the completely rural youth population. In doing so, I explore RD "relative to an array of possible reference groups defined using different comparison orbits of social proximity" (Mayraz et al., 2009:2). I identify self-

selected multiple reference groups²⁶ used separately as well as in combination based on geographic areas as well as demographic and economic status are presented in Table 4.2.

Table 4.2: Self-identified reference groups (as reported by respondents)

Reference group	Youth		Father	Mother
	Yes (%)	No (%)		
<i>Socio-demographic reference groups</i>				
The same age group	88	12	**	**
Birth order/siblings	31	69		
Other youth in the same ethnic group	55	45		
Other youth in another ethnic group	39	61		
Educational level of other youth in the same village	***		**	***
Housing facilities of other youth in the same village	***		**	**
Other youth in the same religious group	58	42		
Other youth in another religious group	41	59		
Peers' behavior (alcohol, and other)			**	***
<i>Geographical areas reference groups</i>				
Other youth in the same Village [neighbors]	94	6	***	***
Other youth in the same kebele	93	7	***	***
Other youth in the same Woreda	67	33	**	**
<i>Economic reference groups</i>				
Size of land holdings	92	8	**	**
Number of livestock holdings	87	13	***	**
Other youth in the same occupation (all the same-type workers)	94	6	**	**

Source: survey result and own compilation from FGD responses.

Note: *** and ** indicates the intensity of comparisons (or relevance of reference groups) for the different object of comparisons (income, economic and social indicators) is highly important and important for socio-economic status comparison as identified during the FGD, respectively. These reference groups are not included in the survey questionnaire and identified through FGD. Some reference groups overlap, for instance, an ethnic group with the whole sample used in combinations with others while others used in their own. Especially, geographic area reference groups are highly used in combination with other reference groups. The use of the same religion as reference group is reported in districts where Muslim and protestant is dominant; whereas use of different religion is so strong in Muslim dominant areas.

Based on Table 4.2, I decided to use the following reference groups: 1) socio-demographic reference groups (other youth of similar age group, education level), 2) geographical areas reference groups (village, kebele and woreda level), 3) economic reference groups (land size, TLU, and youth employed in similar occupation having similar experience) and combinations of the three categories. The concept of the neighbourhood was approximated using the entire village (enumeration area), entire kebele, and entire woreda. Table 4.3 presents descriptive statistics based on the classifications of the reference groups.

In this study, some reference groups serve as an object of comparison. For instance, educational level and a number of livestock owned could serve also as comparison variables. Recent evidence indicates that religion, (which is often ignored, while religious adherence is on the rise), in developing countries

²⁶ In my survey, I identify that the same individual have different reference groups based on variable of interest (this is in line with Runciman, 1966).

is becoming an important factor for economic and social inclusion (or exclusion), and poverty alleviation (or aggravation). The 2015 Global Attitudes survey looked at how people around the world feel about religion in their lives. The study finds that 98 percent of Ethiopians consider religion as a very important part of who they are (Pew Research Centre, Statista).

Table 4.3: Descriptive statistics for the different classification of the reference groups

Reference group	Mean	Std.Dev.	N
<i>Socio-demographic reference groups</i>			
Age			
13-19	16.55	1.33	334
20-24	21.53	1.41	109
25-29	26.66	1.49	115
30-34	31.50	1.49	102
Ethnic group			
Oromo	1	0	659
Educational level(in years)			
Illiterate to only literate	0	0.9	221
1-6 years of education	3.74	1.70	349
7-10 years of education	8.31	1.16	82
More than 11 years	12.28	0.45	7
Religion (frequencies)			
Christian	0.69	0	457
Muslim	0.31	0	202
Youth type			
Live with parents	0.70	0	462
Youth headed	0.30	0	198
<i>Geographical areas reference groups</i>			
Village [neighbors] level	1	0	108
Kebele level	1	0	36
Woreda level	1	0	12
<i>Economic reference groups</i>			
Land size(hectares)			
[0.05-0.75]	0.50	0.21	166
(0.75-1.0]	0.95	0.07	99
(1.0 -1.25]	1.16	0.08	79
(1.25-2.0]	1.69	0.23	126
>2.0	4.24	3.43	172
Number of livestock (TLU)			
[0-1.64]	0.84	0.47	71
(1.64-3.62]	2.61	0.49	90
(3.62-6.73]	5.22	1.01	159
(6.73-12.2]	9.23	1.56	161
>12.2	22.72	12.44	162
Occupation/education			
Part-time/student	0.35	0	229
Full-time/farmer	0.59	0	391
Business/off-farm worker	0.06	0	40

Source: survey results

Note: Average land size (in hectares) holding per household was about 1.89 (median 1.25) with a standard deviation of 2.31 (min land size was .05 ha and the maximum was about 27.29ha). Mean TLU holding for the whole sample was 9.71(median 6.73) with a standard deviation of 10.44. Almost 93.3% of youth employed in farming either on their farm or family farm.

4.4. Objective measurement of relative deprivation and subjective well-being

4.4.1. The data set for objective measurement of relative deprivation

As stated earlier, our main dataset for this study is drawn from the novel Ethiopian Agricultural Growth Program (AGP) survey covering agricultural potential areas of Oromia, Ethiopia. Since I discussed earlier our sample selection procedures, I focus on important data sets used in this chapter.

The survey collected detail information on youth characteristics, household characteristics, father characteristics, mother characteristics, wealth of households, as well as youth's separate wealth, income, employment, social networks, life events, reference groups, and subjective well-being. Community questionnaire includes location and access to basic infrastructures, institutions and youth-related projects and interventions in the areas. After eliminating some due to missing information, non-response and inconsistency, I obtain a sample of 1162 observations based on 620 youth individuals covered in 2010/11 and 2014/15.

In the econometric specifications, I followed the main approach in the analyses of SWB, and regress relative deprivation and other socio-economic factors such as income, health, and non-income factors on youth SWB (Van Praag and Ferrer-i-Carbonell, 2008).

In the objective measures to relative deprivation along different dimensions, I categorize relative deprivation into income, non-income both called economic relative deprivation and social relative deprivation. I construct separate indices for each dimension of relative deprivation using Yitzhaki index across the different reference groups. I follow series of steps presented in section 4.4.3 (in line with Eglar et al., 2016) in computing r objective relative deprivation from the social and non-income indicators. In this paper income used for the computation of relative deprivation index using Yitzhaki measure is yearly household income²⁷, which is calculated as the sum of the sale of crops, off-farm income, the sale of livestock and livestock products, oxen rentals, gifts, transfers, and remittances. In order to take account of inflation, all income measures are deflated to 2011 prices. Computation techniques are presented in the following section. Finally, I relate these indices with youth well-being along with other control variables. The scales of the responses for non-income and social capital indicators show that the weighting of indicators implicitly done by the respondent.

4.4.2. Measuring well-being

Like relative deprivation, the measurement of well-being has always been a controversial issue and subject of debate in economics. There are two main approaches to the measurement of well-being:

²⁷ The farm income here is the gross value of farm output, mainly crop, evaluated at the average farm-gate sales prices in the case of substance farming. The income contributions from livestock is income from the sales of animals and animal products reported by households who sold livestock during the agricultural production seasons. Rental income here is mainly the income contributions from land rents, oxen as well as payments received for capital services such as machineries. Other income includes income from handicrafts, sales of firewood, and charcoal.

cardinal (objective well-being metrics) and ordinal (or subjective well-being metrics). Neo-classical economists such as Alfred Marshall, Leon Marlus and Menger argue that utility (here well-being) is cardinal or quantitative like weight, height and temperature and can be expressed in mathematical variables derived from income, consumption, education or employment status, what is commonly called objective indicators of well-being. On the other hand economists such as Hicks argue that utility cannot be measured numerically, rather it can only be ranked (as 1, 2, 3, and so on) and utility or welfare is related to psychological aspect (or mental state) of individuals. Well-being can also be captured using perceived opportunities and means to achieving things in life using perceptions variables such as perceptions of health, belief in hard work as a means of getting ahead and satisfaction with the freedom to choose in life (Graham and Nikolova, 2015). In this study, I use self-reported measures of well-being (i.e. self-reported subjective metrics - subjective well-being) as proxies for youth well-being captured using specially designed survey questions. This approach has been widely used in literature (Ferrer-i- Carbonell and Frijters, 2004; D'ambrosio and Frick, 2007; Akay and Martinsson, 2011; Easterlin, 1995, among others).

As stated earlier, I capture subjective well-being in two ways: by interviewing youth in surveys using a single-occasion, self-report question, and from the work satisfaction questions of the general Edenred-Ipsos Barometer. The first approach is based on the standard life satisfaction measures on a 9-point scale, ranging from 1 (indicating the worst possible life) to 9 (the best possible life). In this approach, youth respondents were requested to evaluate their well-being as a reflective assessment of one's life as a whole rather than a description of an emotional state. The second approach that uses general Edenred-Ipsos Barometer uses sum of the answers to 17 questions of the Edenred-Ipsos Barometer categorized into three pillars with scores from 1 to 5 (1 strongly disagree and 5 strongly agree). Judgments about life satisfaction specific to life domains such as work, health, community (and/or social networks) and relationships were applied here to capture their satisfaction with life. In line with the previous analyses, the following analyses employ the empirical measure of SWB using self-reported life satisfaction. In other words, I measure SWB using survey questions about satisfaction with life as whole asking respondents to rank their current life relative to their best possible life. Since all other variables of interest such as income and other explanatory variables in the model are captured during baseline data, I used a recall method to capture SWB of individuals at the time of baseline. This technique enabled us to make full use of the panel nature of our dataset since panel data allows controlling for otherwise unobserved individual characteristics. As such, I asked respondents to rate their satisfaction with life over the last five years: four years ago, three years ago, and one year ago compared to their current situation during the second wave of the survey. This exercise also enabled the respondents to assess their personal well-being over time based on their own opinion. After all, SWB is subjective to the individual in question and completely left up to the individual to explain his SWB or level of satisfaction (McBride, 2001). On the other hand, these measures of satisfaction scales may

result in panel effects (learning effects), i.e. respondents may tend to use these scales differently after ‘getting used’ to them. For instance, respondents may stay away from the extreme values such as ‘9’ (Frank et.al. 2006).

Figure 4.1 shows the distribution of subjective well-being across one of the different relevant reference groups (woredas). As indicated below, the distribution of SWB is not similar across the reference group, using woreda, for instance.

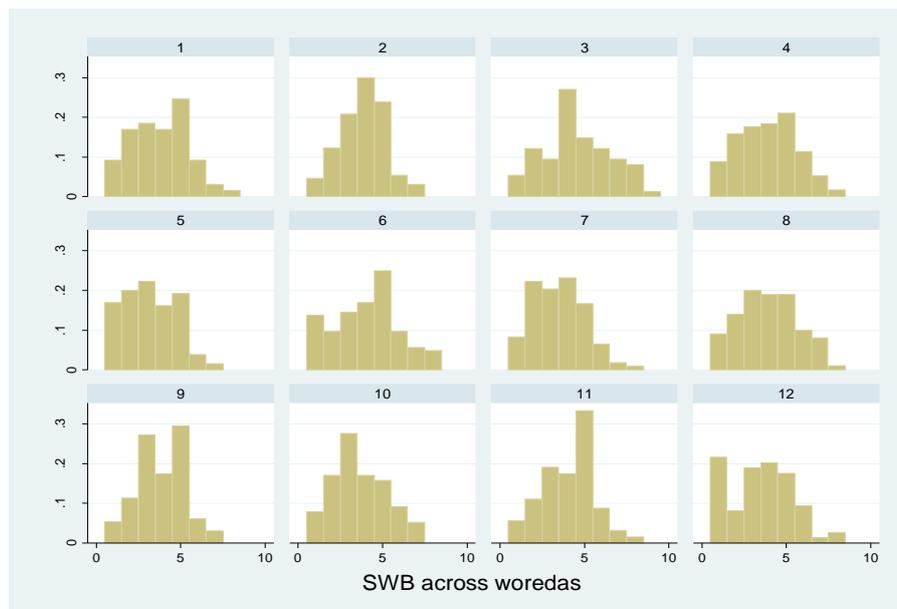


Fig.4.1 Distribution of subjective well-being across woredas

4.4.3. The Empirical Framework and estimation strategy

Objective measurement of relative deprivation

The theoretical foundation of this chapter bases on the concept of relative deprivation put forward by Runciman (1969) and operationalized by Yitzhaki (1979) and Stark and Yitzhaki (1988). As stated earlier, the notion of relative deprivation is that even if I can be satisfied in absolute terms, our level of satisfaction depends on what I see around us. In this study also I conceptualize that youth satisfaction in life depends on absolute and relative income (or wealth) of their own or parents, their social capital and the social capital of their peer groups.

As stated earlier, I decompose ‘objective’ measures of relative deprivation (RD) along three different dimensions: income, non-income, and social capital. Relative income deprivation (RD) (which is commonly based on income and computed using Yitzhaki index) is defined as the gaps between the individual’s (or household’s) income (or wealth) and the incomes (or wealth) of all individuals or households richer than their within a reference group. According to this measure, individuals or households within the same reference group and with identical income, Y, all experience the same level of relative deprivation. The same is true with other dimensions of relative deprivation such as social

capital deprivation (SD) and non-monetary relative deprivation (NID) (i.e. deprivation in material assets). With some extension of Stark and Zawojka (2015), I model the link between relative deprivation of the different dimensions and youth well-being using objective measures of RD in the following way. Consider a youth population of n in which every member of n has a positive level of income, Y_i . Income distribution of youth (or households) are given by $Y_1 < Y_2 < \dots < Y_n$; where Y_i denotes the income of the household to which youth i belong. In the same manner, the social score distribution like the income distribution are given by $S_1 < S_2 < \dots < S_n$; where S_i denotes the social score (or capital) of the i th youth. Like-wise, the non-income items or material possessions that display one's social status compared to those generally owned in his or her reference groups are also given by $NI_1 < NI_2, \dots < NI_n$; where NI_i denotes the non-income items (or patterns) of the i th youth belonging to a household.

Thus, I define the utility (or well-being) function, U_i , of youth i belonging to population n as follows:

$$\begin{aligned}
U_i(Y_1, \dots, Y_n) = & \beta_i Y_i + (1 - \beta_i) RD_i^r(Y_1, \dots, Y_n) \\
& + \theta_i S_i + (1 - \theta_i) SD_i^r(S_1, \dots, S_n) \\
& + \delta_i NI_i + (1 - \delta_i) NID_i^r((NI_1, \dots, NI_n))
\end{aligned} \tag{4.1}$$

Where $RD_i^r(\cdot)$ is a measure of relative income deprivation; $\beta_i \in (0,1)$ expresses the weight accorded by youth i to their parents' incomes; $(1-\beta_i)$ expresses the intensity of concerns that youth i attach to relative income; $SD_i^r(\cdot)$ and $NID_i^r(\cdot)$ are measures of relative social deprivation and relative non-monetary deprivation, respectively; $\theta_i \in (0,1)$ is the weight accorded by youth i to their social capital; $(1 - \theta_i)$ and $(1-\delta_i)$ denote the intensity of concern that youth i attach to relative social capital and relative non-monetary income, respectively; r denotes types of self-identified reference groups presented in Table 4.3. Relative income, relative non-income and relative social deprivations of youth i , who are members of a reference group of n individuals (i.e. the subpopulation of all individuals belonging to the same reference group (r) such that $i=1, 2, \dots, n$), are defined as the weighted sum of the excesses of incomes, non-incomes and social capitals higher than Y_i, S_i, NI_i such that the excesses are weighted by their relative incidence, respectively.

To operationalize objective measures of relative deprivation, I calculated relative deprivation for each youth within identified reference group using the Yitzhaki index (Yitzhaki, 1979). For instance, the relative income deprivation function of youth i with household income, Y_i , who is a member of a self-identified reference group (r) of n individuals, is given as follows:

$$RD_i^r(Y_1, \dots, Y_n) = \frac{1}{n} \sum_{j=i+1}^n (Y_j - Y_i) \tag{4.2}$$

Where $Y_j > Y_i$; noting that for any $j \leq i$, $\max \{Y_j - Y_i, 0\} = 0$; j is individuals whose income are greater than i ; n is the subpopulation of all individuals belonging to comparison group or reference group, r , i.e. the

number of individuals who are in the r reference group. Note that n varies with the kinds of reference groups used. With this measure of relative income deprivation, an individual (or household) i with say income Y is deprived of all income above Y (Stark and Taylor, 1991), i.e., $RD_i = RD_i(RI_i)$, where RI denotes relative income in comparison to the reference group. Therefore, individuals within the same reference group and with identical income Y all experience the same level of relative income deprivation. The Yitzhaki index is an ‘upward looking’ index of deprivation by construction. Based on this construction, I model and calculate ‘ $r=12$ ’ estimates of RD for each youth i . One of the prominent findings in this study that deserves special attention is the direction of the effect of relative income deprivation on SWB. If the economic success (income in this case) of other individuals or households in the reference groups depresses youth welfare, it means that the coefficient of RD ($1 - \beta_i$) is negative and interpreted as ‘status effect’. On the other hand, youth well-being can be positively affected by the income of the relevant peer groups. Under such conditions, I expect that the coefficient of RD ($1 - \beta_i$) is positive and can be an indication of a ‘signal effect or positive source of information’ - higher income of others in the reference group indicate higher prospects for youth, that shapes future expectations and decisions. It means also that youth build aspirations based on the achievements of other peers such as based on the standard of living of other youth of similar age, occupation, etc. Positive effect of relative deprivation on SWB could be also related to pure ‘economic externalities’, where relative income (deprivation) act as a proxy for the benefits of living with rich(er) people or wealthy neighbourhoods (Ferrer-i-Carbonell, 2005). It’s possible that the two effects could exist simultaneously. In this case, when the status effect dominate the signal effect, the coefficient of relative deprivation is negative, whereas the effect is positive when vice-versa.

Similarly, I compute social relative deprivation obtained from social capital indicators, as the weighted sum of the excess of social scores higher than S_i such that the excess is weighted by its relative incidence:

$$SD_i^r(S_1, \dots, S_n) = \frac{1}{n} \sum_{j=i+1}^n (S_j - S_i) \quad (4.3)$$

Where $S_j > S_i$; noting that $j \leq i$, $\max \{S_j - S_i, 0\} = 0$.

A similar approach is used in Elgar et al. (2016). Mathematically, the same approach is also employed to compute relative non-income (non-monetary) deprivation (NID) from the non-income scores/items (NI) as follows:

$$NID_i^r(NI_1, \dots, NI_n) = \frac{1}{n} \sum_{j=i+1}^n (NI_j - NI_i) \quad (4.4)$$

where $NI_j > NI_i$ and $j \leq i$, $\max \{NI_j - NI_i, 0\} = 0$

Though I cannot determine a priori, I expect that relative social deprivation and non-monetary relative deprivation are negatively associated with youth well-being. However, large social networks improve well-being significantly (Akay et al., 2012).

Generally, a utility function encompassing the three dimensions of relative deprivations and other related factors, important for well-being can be expressed in the following relation:

$$U(i, h) = SWB(RD_i^r, SD_i^r, NID_i^r, Y_i, S_i, NI_i) \quad (4.5)$$

Alternatively, the above relationship can be expressed as follows where the different dimensions of relative deprivation are the function of the respective income, social capital, and non-income of the reference groups:

$$U(i, h) = SWB(RD_i^r(Y_i, Y_j), SD_i^r(S_i, S_j), NID_i^r(NI_i, NI_j), Y_i, S_i, NI_i) \quad (4.6)$$

Where r , i , j , and h as defined earlier.

Estimation strategy

Given the ordinal nature of the dependent variable, SWB, the ordered probit specification would be an appropriate method employed in regression. In order to make full use of the panel nature of our data and controlling for otherwise unobserved individual characteristics and potentially different use of the underlying satisfaction scale across individuals, an ideal approach would be to employ a fixed effects estimator. Unfortunately, such a fixed-effects ordered probit estimator does not exist in standard statistical software packages. As an approximation, I use linear fixed-effects regression models, in addition to the use of random-effects ordered logistic regression models. The first alternative approximation has been commonly used in literature (Ferrer-i-Carbonell and Frijters, 2004; D'Ambrosio and Frick, 2006; for instance).

Our default model specification considers SWB as latent:

$$SWB_{it}^* = \beta_{absolute} \log(Y_{it,h}) + \gamma Z_{it} + \sigma_k + u_{it} \quad (4.7)$$

Where SWB_{it}^* is the self-reported SWB of youth i on a subjective scale ranging from 1 to 9; Y_i is absolute per capita income (PCI) of youth i that belongs to household h in year t (in log form); Z_i is a vector of observable individual, household and community characteristics which affect wellbeing; σ_k is district and other individual level fixed effects (unobservable time invariant) that captures unobservable differences, and u_i is the error term, which is assumed to be normally distributed with mean zero and variance one. I compare our results using multiple reference groups against this benchmark model. To test the impacts of the different dimensions of relative deprivation on the well-being of youth, I extend our specification in (4.7) above as follows:

$$SWB_{it}^* = \beta_{absolute} \log(Y_{it,h}) + \beta_{relative} \log(RD^r(Y_{it}))$$

$$\begin{aligned}
& + \theta_{absolute} S_{it} + \theta_{relative} SD^r(S_{it}) \\
& + \delta_{absolute} NI_{it} + \delta_{relative} NID^r(it) + Z'_{it}\gamma + \sigma_k + u_{it}
\end{aligned} \tag{4.8}$$

Where $RD^r(Y_i)$ is the income relative deprivation of youth i with respect to the reference group, r ; S_i is an index constructed from different indicators of social capital-different indicators used to compute social index is presented in appendix; $SD^r(S_i)$ is social relative deprivation of youth i in the reference group, r , defined in the same way as above; NI_i is non-income index computed from the different scores of non-income which are economic indicators (see appendix A4.1); $NID^r(NI_i)$ is non-income relative deprivation of youth i who belongs to reference group, r , defined above; $(.)_{absolute}$ and $(.)_{relative}$ are parameters for absolute and relative income, non-income and social capital to be estimated, respectively. In the estimations, I employ a number of different specifications to check the robustness of our results. For instance, I separately estimate the different specifications presented above for youth members and youth household heads, and for young men and women. I also include father and mother characteristics (Eq.4.9), and interaction terms (Eq. 10), to the above specifications, expressed as follows:

$$\begin{aligned}
SWB_{it}^* &= \beta_{absolute} \log(Y_{it,h}) + \beta_{relative} \log(RD^r(Y_{jt})) \\
& + \theta_{absolute} S_{it} + \theta_{relative} SD^r(S_{jt}) \\
& + \delta_{absolute} NI_{it} + \delta_{relative} NID^r(NI_{jt}) \\
& + \rho F_{it} + \mu M_{it} + Z'_{it}\gamma + \sigma_k + u_{it}
\end{aligned} \tag{4.9}$$

$$\begin{aligned}
SWB_{it}^* &= \beta_{absolute} \log(Y_{it,h}) + \beta_{relative} \log(RD^r(Y_{jt})) \\
& + \theta_{absolute} S_{it} + \theta_{relative} SD^r(S_{jt}) \\
& + \delta_{absolute} NI_{it} + \delta_{relative} NID^r(NI_{jt}) \\
& + \beta_{absolute} \log(Y_{it,h}) * Edu_{mom} \\
& + \rho F_{it} + \mu M_{it} + Z'_{it}\gamma + \sigma_k + u_{it}
\end{aligned} \tag{4.10}$$

Where F and M denote father and mother characteristics. As stated earlier, I expect that absolute income, non-income and social networks or social capital affect SWB positively ($\beta_{absolute} > 0$; $\theta_{absolute} > 0$; $\delta_{absolute} > 0$), implying a higher income, non-income and social networks or social capital is associated with a higher welfare. However, the effects of relative income deprivation, non-income deprivation and social deprivation are a priori undetermined i.e. their effects could be negative or positive.

I pre-determined that I would not use combinations in the analysis where the minimum number of individuals in the reference group is less than 5. I will use the whole sample “all” as a reference group, an indicator of the same ethnic group. To control for as well as to capture the likely impact of youth’s own separate income on well-being, I include a dummy variable (1 if youth have a separate cash income, 0 otherwise).

For further robustness check, I propose an alternative specification to Eq (4.8) expressed as follows:

$$SWB_{it}^* = \alpha \log(Y_{it}) + \beta^r \log(\bar{y}_{rt}) + n \log(S_{it}) + a^r \log(\bar{S}_{rt}) + b \log(NI_{it}) + m^r \log(\bar{NI}_{rt}) + Z'_{it}\gamma + \sigma_k + u_{it} \quad (4.11)$$

Where in this equation \bar{y}_r is the average income of reference group r, defined as:

$\bar{y}_r = \frac{1}{n} \sum_1^n (y_i^r)$; Where y_i is income of individual i in the reference group r, and the same method of computation and interpretation is applied for average social and non-income of reference group r; the rest as defined earlier; β^r, a^r, m^r denote relative deprivation of income, relative social deprivation and relative non-income deprivation, respectively. I find virtually similar conclusions, not reported here. Unlike that of the Yitzhaki index where individual's RD is the weighted sum of the excesses of incomes, non-income or social capital higher than individual's income, non-income, or social capital such that each excess is weighted by its relative incidence; individuals compare their income, non-incomes or social capital to the average income, non-income or social capital of their reference group.

4.4.4. Results and discussions: evidence from objective relative deprivation

I first present the main descriptive results of the characteristics of our respondents. Following that, I present the econometric results of the various specifications, presented earlier.

4.4.4.1. Descriptive results from the objective measures

Table 4.4 summarizes the basic characteristics of our youth sample. The average age of our youth sample is about 18 and 22 years in 2010 and 2015, respectively. Youth sample contains mostly male (63%). The majority of youth live with their parents (73% and 71% in the year 2010 and 2015, respectively). The average years of education are about 2.83 years during the baseline survey, and it has increased to 4.20 years during the follow-up survey. About 72% of youth are single in 2010/11; this percent has decreased to 64 % in 2014/15. The average farm size per own capita is about 0.56 hectares in 2010/11 and this has decreased to 0.53 hectares in 2014/15 agricultural production season.

Table 4 4: Characteristics of the youth respondents

Category	2010/11	2014/15
Average age (in years)	18.45	21.54
Gender (%)		
Male	62.97	62.97
Female	37.03	37.03
Years of education	2.83	4.20
Family size	7	6.00
Farm size per capita(ha)	0.59	0.53
Man occupation (%)		
Part-time(student or domestic worker)	43.47	33.55
Full-time farmer	54.46	59.52
Non-farm worker	2.07	6.94
Youth type (%)		
Household head	27.00	29.00
Household member	73.00	71

Source: survey results. Other includes widow, divorced, not together for any reason or married more than one spouse

Table 4.5 summarizes the main descriptive results for the different dimensions of relative deprivation computed using Yitzhaki index for the year 2014/15. The lowest income relative deprivation index is obtained when youth compare themselves with that of their peers (i.e. when the youth of similar type is used as a reference group). The highest income relative deprivation is obtained when youth compare their per capita income with that of other youth of similar age group, the same ethnic group, similar education and the same occupation.

As to the non-income relative deprivation, the highest and the lowest score is obtained with respect to reference groups (land size, education, ethnicity), and other youth in the same kebele, respectively. I compare the results of the social relative deprivation scores across the reference groups. The test results for the mean differences suggest that the differences are statistically significant for the reference groups *youth type versus similar age* (p-value=0.000); *youth type versus similar education* (p-value=0.00); *marital status versus the same ethnic group* (p-value=0.000); *youth type versus the same village* (p-value=0.000), and *youth type versus land size* (p-value=0.000). The highest social relative deprivation score is obtained with respect to socio-demographic reference groups (specifically youth of similar age and ethnicity) and economic reference groups (specifically land size and the same occupation). The three dimensions of relative deprivation indices indicate that youth are feeling more deprived when the scope of geographic reference groups increases from village to woreda level. Hence, reference group definition and selection matters in well-being analyses. Summary statistics of other relevant variables used in the regression models is presented in appendix A4.1.

Table 4.5: Mean relative deprivations across reference groups: results of objective measures

	Socio-demographic reference groups			Geographical areas reference groups			Economic reference groups			Composed reference group	
	Age	Education	Ethnicity	Village	kebele	Woreda	Land size	TL U	occupation	Age_woreda	Age_occupation
<i>Economic relative deprivation</i>											
Income RD (birr)	1156.22	1.04	1155.98	829.63	840.96	1052.27	1020.86	990.48	1124.38	1132.18	344.19
Education RD (years)	1.61	-	1.52	1.33	1.26	1.36	1.50	1.40	1.41	1.38	1.51
Non-income RD	1.13	1.16	1.16	0.98	0.97	1.02	1.16	1.14	1.12	1.13	1.14
<i>Social relative deprivation</i>											
<i>Social RD</i>	2.12	2.11	2.13	2.05	2.07	2.09	2.12	2.10	2.13	2.11	2.11

Source: survey results

I asked also respondents how important is the different income, non-income or wealth (such as livestock ownership, housing facilities, clothing), and social capital (specifically connections or networks) comparisons are to them in affecting their life satisfaction compared to their most relevant groups. For instance, I asked: “Which of the following comparison indicators are the most relevant to you to compare your own life situations, to that of others?” I request respondents to indicate either important or not important to the list of comparison indicators (the object of comparison) provided to them. This question was preceded by questions that ask respondents whether they compare their living conditions with others and whether this kind of comparison is relevant for their life satisfaction. If a respondent

was found to indicate a ‘yes’ response, a follow-up question was asked to find out which reference group(s) individually or in combination is (are) at the stake in comparing one’s own socio-economic status with that of others (i.e. positioning one’s life situation) using dichotomous questions until the list is exhausted²⁸. Table 4.6 presents the summary results of the most important objects of comparison, including income. Most respondents regard cash income (92%), livestock ownership (89%), living environments (access to basic infrastructure such as water, road, and electricity) (76%), education (80%), housing facilities (86%), clothing (85%), and social capital (75%) as important (relevant) to their assessment of life satisfaction with that of others. This indicates that youth regard not only cash income but also non-income and social capital comparisons essential for their life satisfaction. Descriptive results indicate that these objects of comparison change over time.

Table 4.6: Income, non-income and social comparisons

Dimensions (of comparisons)	“Which of the following object of comparisons are perceived to be important for you in comparing your life situation with that of others?”	Responses (%)	
		important	not important
Economic	Income	92	8
Economic	Number of livestock	89	11
Economic	Access to different infrastructure (access to electricity, water, road)	76	24
Economic	Quantity of harvest	88	12
Economic/social	Creativity (entrepreneurial ability)*	FGD	FGD
Social/consumption	Education level	80	20
Social/ consumption	Housing facilities	86	14
Social	Clothing	85	15
Social/	Social connectedness; membership in clubs(groups)	75	25

Source: Survey results

Note: FGD refers to focus group discussion, and an indicator corresponding to it was identified through group discussion held among groups. * suggest that the performance or success of others matter for youth assessment of living conditions in comparison to others.

4.4.4.2. Econometric results from objective measures of relative deprivation

Since the choice of a reference group in the first place determines the results of our estimation since results are highly sensitive to such choice and specifications. I begin our analysis by examining whether the reference groups identified by the respondents are statistically and economically meaningful in explaining the relationship between the different dimensions of relative deprivation and SWB (i.e. self-rated life satisfaction). In doing so, I begin by estimating the following regression models:

$$SWB_{it}^* = \beta \log(Y_{it,h}) + \alpha RG_{it}^r + Z'_{it} \gamma + \sigma_k + u_{it} \quad (4.12)$$

Where RG_{it}^r denotes a dummy for reference group, r, reported by youth i which takes 1 if the stated reference group perceived as a relevant comparison group and 0 otherwise; $r \in \{\text{socio-demographic comparison groups, geographic area reference groups, economic reference groups}\}$; the rest are as defined earlier. Following this, I run series of tests to show that income alone is not enough to capture

²⁸ Based on literature, I prepared an exhaustive list of reference groups (about 15), out of which I finally selected 10 reference groups and 2 composite reference groups based on frequency of responses.

the effect of RD on SWB in rural areas, and show that non-monetary object of comparison such as social capital and non-income (or non-monetary assets) are equally important for the analyses of the impact of RD on well-being (Table 4.8). Our analysis in this regard is similar in spirit with Mayraz et al. (2009) who investigate the realized importance of the different relative income comparisons using German Socio-Economic Panel Study (SOEP). However, our approach is unique in the sense that I disaggregated relative deprivation along three dimensions: relative income (monetary) deprivation, relative non-income (non-monetary) deprivation and relative social deprivation that enable us to explore a broader range of indicators relevant for young people's well-being. In addition, our approach is different in the sense that I don't only ask respondents to report how their objects of comparison (income, non-income, social capital, etc.) compares to various reference groups but also I ask them to identify the most relevant reference groups against which they compare their life situations. The first thing to note in Table 4.7 is that except for village and woreda, all the self-identified reference groups are statistically significant and hence, relevant in the analyses of well-being. However, the relevance of each of the reference groups (reflected by the magnitude of coefficients) on SWB varies greatly, with the highest association with the reference groups: similar age and same occupation. There are also apparent differences of the relevance of reference groups in the SWB of young men and women. The insignificant positive impact of the importance of geographic reference groups (the same village and woreda) on SWB for the whole sample turns significant for male and female subgroup analyses. This suggests the importance of gender roles in relative concerns and the different impacts and preferences of reference groups for young men and women. It is interesting to note that with respect to woreda reference group, the impact is negative for the whole sample and female sub-sample. The positive impact of the importance of reference groups on SWB suggest the signal effect of RD, which I investigate later in more detail.

Table 4.7: The effects of reference groups on subjective well-being of youth

VARIABLES	AGE	OCCUPATION	VILLAGE	WOREDA	ETHNICIT Y	OTHER_ETHN C	SAME_RELIGIO N	OTHER_R ELIGION
All								
Reference dummy (1 if important, 0 otherwise)	0.570*** (0.149)	0.721** (0.202)	0.184 (0.205)	-0.0687 (0.100)	0.311*** (0.0967)	0.438*** (0.102)	0.362*** (0.0981)	0.001 (0.100)
Log(income per capita)	0.198*** (0.0596)	0.175*** (0.0615)	0.181*** (0.0615)	0.214*** (0.0593)	0.168*** (0.0612)	0.173*** (0.0613)	0.169*** (0.0613)	0.183*** (0.0612)
Land size per capita	0.848*** (0.261)	0.895*** (0.268)	0.883*** (0.268)	0.767*** (0.259)	0.935*** (0.268)	0.954*** (0.268)	0.926*** (0.270)	0.021 (0.269)
Observations	1162	1162	1162	1162	1162	1162	1162	1162
Male								
Reference group (1 if important, 0 otherwise)	0.578*** (0.188)	0.344 (0.279)	0.658** (0.275)	0.049 (0.133)	0.561*** (0.125)	0.486*** (0.128)	0.504*** (0.128)	0.525*** (0.127)
Log(income per capita)	0.279*** (0.0825)	0.298*** (0.0822)	0.309*** (0.0824)	0.299*** (0.0822)	0.286*** (0.0824)	0.290*** (0.0823)	0.297*** (0.0824)	0.307*** (0.0823)
Land size per capita	0.531 (0.347)	0.446 (0.346)	0.412 (0.345)	0.420 (0.345)	0.536 (0.347)	0.483 (0.346)	0.431 (0.345)	0.371 (0.346)
Observations	743	743	743	743	743	743	743	743
Female								
Reference group (1 if important, 0 otherwise)	0.509* (0.303)	0.174 (0.332)	-0.499 (0.359)	-0.341* (0.191)	0.0309 (0.170)	0.342* (0.189)	0.167 (0.173)	0.284 (0.185)
Log(income per capita)	0.0457 (0.112)	0.0721 (0.110)	0.0871 (0.110)	0.0888 (0.110)	0.0770 (0.110)	0.0757 (0.109)	0.0656 (0.110)	0.0799 (0.109)
Land size per capita	2.192*** (0.574)	2.056*** (0.555)	2.048*** (0.555)	2.096*** (0.560)	2.045*** (0.555)	2.132*** (0.556)	2.121*** (0.565)	2.101*** (0.558)
Observations	419	419	419	419	419	419	419	419
Household characteristics	Yes							
Individual characteristics	Yes							
Other controls	Yes							
Year fixed effects	Yes							

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: I control for woreda level fixed effects and other relevant variables (reported in Appendix Table A4.1). The dependent variable, youth subjective well-being, is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life).

Benchmark results: the standard socio-demographic and economic variables

Before turning specifically to the discussions of the impact of the absolutes and the different dimensions of RD on SWB in the next section, I briefly discuss here a comprehensive analysis of the determinants of youth SWB. For this purpose, I estimate Eq. (4.7) without including relative deprivations in the specifications (presented in the second column of Table 4.8). Our aim here is to check whether the determinants of SWB are in line with what is suggested in the literature, and also to establish the bases of comparisons to the various specifications and estimations for each of the multiple reference groups presented earlier.

The results of the benchmark estimation presented in Table 4.8 shows that the signs and significance of the parameters for the standard economic and socio-demographic characteristics are overall as in the literature and in line with the findings of Akay et al.(2012) and Akay et al.(2014). However, unlike their findings, I find an inverted U-shape relationship between SWB and age of youth. As presented earlier in the proceeding chapter, the result is expected given the fact that our sample is mainly youth groups. One would expect that well-being of young people increases in their early age and decreases, as they

get older. The most common factors found to have a significant impact on SWB of youth include income per capita, social capital, youth marital status, having separate cash income, number of female youth members in a household, availability of drinking water during dry season, livestock holding, availability of public water and age of household head. I find the strong positive impact of income, social capital, and drinking water sources and livestock ownership on SWB. The strong effect of social capital may be explained by relationship attributes such as altruism or informal support systems and kinship relations that help individuals to cope with risks or succeed in a career. I find also a strong and negative effect of lack of mobile phone, leading to a sharp decrease in well-being. As I discussed earlier, though lack of mobile phone among the youth is negatively related to SWB, mobile phones can serve as either status-seeking good or a device that bridge the information gap related to agriculture (such as weather forecasts and market prices). If the purchase of mobile phone is competing for higher status, this may often force individuals or households to divert resources from meeting basic needs. However, if mobile phones are for accessing information, they contribute to effective information flow thereby enhancing production and marketing decisions that in turn enhances welfare. Recent evidence indicate that mobile phones provide great opportunity to bridge the information gap related to agriculture, though currently there is limited access to ICT in SSA (Tekalign et al., 2011; World Bank, 2013; Tadesse and Godfrey, 2016).

Having access to public pipe drinking water, which indicates also the impact of health, have a strong positive effect on wellbeing. The strong effect of health-related factors on SWB is also reflected via the effect of household's main source of drinking water during the dry season. I find that all dummies (river or lake, rainwater, unprotected well, stream), other than a pond or protected well (the base category), have negative effects on well-being. It is also interesting to note that having separate cash income is a strong predictor of youth subjective well-being.

Per capita, land size and a number of livestock owned are among the other most commonly considered economic factors found to have a positive effect on SWB of youth (similar to what is documented by Bezu, 2014; Akay et al., 2014). In line with the findings from the experimental approach, the presence of female youth members in the household increases SWB. I also confirm a positive effect of marital status on SWB (Helliwell, 2003; Akay et al., 2012). Controlling for individual characteristics, education of youth and being enrolled in school have no statistically significant impact on SWB probability because of the reasons stated in the previous chapter. However, birth order has a positive significant effect on SWB.

The effects of other socio-economic and demographic characteristics on SWB, controlling for when RD

In the next section, I briefly discuss here a comprehensive analyses of SWB of youth estimated separately (using Eq. (4.9), when relative deprivations of different dimensions included in the

models) for each of the 10 self-identified reference groups using random effects ordered logit models before turning to the discussion of the effect of relative deprivations across the various specifications and reference groups. Overall, the signs and significance of the parameters for the usual socio-economic, demographic and community characteristics presented above remain consistent across the various definitions of reference groups. However, the effect of some variables on SWB observed in the benchmark model disappears or weakens toward some reference groups whereas others turn significant and stronger. For instance, youth relationship to head (or marital status of youth) which is significant (at 10%) becomes insignificant across all the reference groups used. The same is true with social capital except towards the reference group-*youth of similar type*. The strong impact of social capital in the benchmark model disappears towards other reference groups, but it remains strongly significant for the *youth of similar status (colleagues)*, which is also partly related with the youth of similar age group. This is probably because of the fact that youth form networks with their alike youth, hence this reference group serves as network formation which enhances wellbeing. That is also probably why the effect of social capital is significant only towards the reference group-*youth of similar status*. Other socioeconomic and demographic variables that turn significant after controlling for relative deprivations include a number of male youth members in the household and distance to the nearest public marketplace. For example, a number of male youth members in the household has a positive and significant effect on the well-being of youth *visa-a-vis similar occupation*. As expected, the effect of absolute income on SWB remains positive and strongly significant in all cases (ranging from 0.30 to 0.60 points on a scale of 1-9, the highest *visa-a-vis similar occupation*). Alem (2014) in urban Ethiopia, also finds that happiness increases with absolute income. Authors like Knight and Gunatilaka (2012) in rural China and Stutzer (2004) in Switzerland find also similar effects of absolute income on happiness. Now, I turn to the discussions of the impact of relative deprivation along the three dimensions across various reference groups (domains).

The effect of relative deprivation on SWB

Economic relative deprivation

The estimation results from standard random effects ordered logit models suggest that the magnitude of relative deprivation (relative deprivation disaggregated along three dimensions: income, non-income and social relative deprivation) vary with the reference groups employed. In other words, the effect of the three different dimensions of relative deprivation on SWB is

either weaker or stronger depending on the choice and definitions of reference groups; whereas the sign of the estimates remains consistent across the reference groups (Table 4.8).

Specifically, the estimates of relative income deprivation remain positive and strongly significant towards all the reference groups employed. The strong relative income deprivation effect on SWB vis-a-vis the reference groups youth type (colleagues) and occupation compared to other domains suggest that youth compare their achievements, especially feasible achievement such as income with those of others of similar status and occupation. Unlike the previous studies in developing countries, the magnitude of relative income deprivations (0.70 for education and 0.86 for occupation) is striking and suggest the important role of relative deprivation in the well-being of rural youth (the only study I am aware of is Akay et al., 2012, who find strong effect of relative income among migrant and urban workers in China). The consistent strong positive effect of relative income deprivation on well-being suggests the ‘‘signal effect’’ of relative income deprivation. The findings are robust to the use and definition of reference groups. The findings also serve as a basis for social comparisons or it provides a prospect that shapes future expectations. Thus, it suggests that youth emulous of their better-offs (or rich) comparison groups. Other studies focused on poor countries have also found that relative income is positively associated with happiness or life satisfaction (Ravallion and Lokshin, 2010 for Malawi; Kingdon and Knight, 2007 for South Africa). Interestingly, the effect of non-income relative deprivation remains negative but significant only for reference groups’ similar education and size of livestock holding. If social capital and assets are differentiated, the effects of RD vis-a-vis education reference group turns negative resulting in life satisfaction reduction. This variable turns significant in these domains mainly because of the fact that education and TLU are the two most important wealth and social indicators commonly used as status indicators. Relative deprivation in these two aspects reflects conditions of worsening both absolute and relative poverty strongly influencing youth welfare. It’s also interesting to note that, the magnitude of relative deprivation (both income and non-income) varies across the choice of reference groups. The overall effect on SWB depends on the relative magnitude of the two effects as both offset each other. Contrary to our findings Oshio et al. (2011) find the Yitzhaki measure of relative deprivation to be negatively correlated with happiness for China and South Korea. Overall, our estimation results imply that living in high-income neighborhoods (or comparison groups whether it’s based on socio-demographic, geographic or economic reference groups) enhances life satisfaction via signal effect or economic positive externalities (results of aspirations) while non-monetary deprivation in

terms of material or assets reduces life satisfaction. In other words, high level of income in a reference group works as a signal about the future income level of young people, in general, leading to high well-being or less welfare loss. This finding is in line with Easterlin's (1995) conclusion.

Social relative deprivation

Perceptions of deprivation, whether in terms of material or non-material could be a source of social capital as well as discontent, especially among young people. Social capital out of which I derive social relative deprivation is broadly constructed here: social trust, social networks (or interactions) and social norms. One of the most important livelihood assets rural people own is social capital. Social capital plays an important role in helping youth negotiate their way out of disadvantage, coping with risks or shocks, enjoyment of life, the source of hope and help to improve their relative standing in comparison to their peers. It facilitates interaction among individuals, groups or societies, to get a loan (serves as a collateral), create motivation or enthusiasm. This is reflected by the strong positive impact of social capital variable and negative and significant impact of social RD on SWB using the different specifications and reference groups (Table 4.8). Relative social deprivation affects the well-being of young people in several ways, that has long-lasting effect on human, physical, psychological as well as economic development. I find a statistically significant social relative deprivation towards all the reference groups employed except for youth type, kebele and size of livestock holdings with the strong effect vis-a-vis similar age, ethnicity and religion. For instance, youth who regard income comparisons as important compared to their peers are associated with approximately a 0.24 lower life satisfaction rating (measured in a 1-9 scale). During focus group discussion I also identify that the most common channels through which young people make frequent social contact and companionships are with their ethnic groups, colleagues, youth in their occupation and youth of similar age group. Thus, large social capital improve SWB in many ways: through social networks that enable youth access to resources, insurance, through creating enthusiasm or moral support and by affecting health or risk behaviour in the sense that individuals who are embodied in a network or community have better support and social trust that enable them to have access to resources to achieve better health or other goals in life, hence higher life satisfaction. The strong effect of social capital vis-à-vis these reference groups confirms the channels through which social networks, trust, and cooperation are formed in rural areas for common good. Social capital enables the performance of individuals or groups, the growth (capability) of an individual and means to exercise agency. Hence, deprivation in this regard has a strong negative effect on life satisfaction. Our findings confirm this.

Though the role of social capital is significant for the well-being of youth, the effect of relative social deprivation is insignificant for other reference groups probably because of the high multicollinearity between social capital variable and social relative deprivation. Dropping social capital variable has

resulted in significant and strong negative impact of social relative deprivation on SWB across all reference groups, except for the domain colleagues. The benchmark result presented earlier also support this hypothesis. The insignificant impact of the later may be explained by altruism and informal support systems from families or colleagues, as reflected in strong significant relationship toward the reference group: similar age group, youth in the same ethnicity, and youth in the same religion. Evidence also indicate that participation in organizations such as in religious participation, and participation in extracurricular activities enable youth to establish extensive connections to others that would weaken the negative effect of social deprivation (Checkoway, 2011; Dufur et al., 2013). On the other hand, lack of social capital (i.e. deprivation in social capital) can impair the benefits described above. It's also interesting to note that social capital may not always be used for positive ends (Monica, 2015). I find that social capital has a negative effect (though statistically insignificant) on youth life satisfaction for the reference groups-youth of similar education level, ethnicity, and religion. An example of such complexities of the effects of social capital is violent or protest activity that is encouraged through the strengthening of intra-group relationships often called bonding social capital, particularly exercised at schools, religious places or within ethnic groups. Social capital may also lead to undesirable outcomes, for instance, if the political institution and democracy is not strong enough and overpowered by the social capital groups. The recent protest in Ethiopia is a good example in this case where youth use their networks at school and religious places to organize themselves to protest.

Table 4.8: Estimation results from random effects ordered logit models using objective RD

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Benchmark	AGE	YOUTHTYPE	EDUCATION	ETHNIC	RELIGION	VILLAGE	KEBELE	WOREDA	LAND	TLU	OCCUPATION	OCCUP_AGE	WORE_AGE
Income RD	-	0.619** (0.305)	61.11*** (18.05)	0.702** (0.306)	0.628** (0.312)	0.612* (0.316)	0.347 (0.307)	0.117 (0.321)	0.647** (0.319)	0.576** (0.290)	0.744** (0.317)	0.869*** (0.316)	0.0504*** (0.00815)	0.659** (0.318)
Log(income per capita)	0.107 (0.0972)	0.405** (0.188)	0.137 (0.0997)	0.452** (0.186)	0.407** (0.189)	0.399** (0.190)	0.280 (0.187)	0.155 (0.190)	0.412** (0.190)	0.368** (0.180)	0.453** (0.189)	0.525*** (0.189)	0.119 (0.0980)	0.420** (0.189)
Social RD	-	-0.331*** (0.125)	19.39 (44.09)	0.0487 (0.296)	-0.36*** (0.128)	-0.35*** (0.129)	-0.192* (0.114)	-0.169 (0.119)	-0.312** (0.128)	-0.269** (0.131)	-0.190 (0.125)	-0.317** (0.128)	-0.298** (0.124)	-0.308** (0.124)
Non-income RD	-	0.00841 (0.305)	-9.934 (106.3)	-0.362*** (0.127)	0.0393 (0.302)	-0.0843 (0.300)	-0.0183 (0.320)	-0.242 (0.368)	-0.148 (0.313)	0.180 (0.299)	0.509* (0.266)	0.146 (0.258)	-0.0582 (0.298)	0.121 (0.284)
Non-income index	0.0345 (0.112)	0.0252 (0.210)	0.0367 (0.113)	0.0512 (0.208)	0.0431 (0.210)	-0.0330 (0.217)	0.0176 (0.248)	-0.125 (0.273)	-0.0692 (0.224)	0.127 (0.209)	0.332* (0.194)	0.108 (0.178)	-0.0151 (0.210)	0.0976 (0.206)
Social capital	0.313*** (0.102)	-0.0683 (0.176)	0.312*** (0.103)	-0.102 (0.178)	-0.104 (0.178)	-0.0854 (0.178)	0.0985 (0.171)	0.109 (0.175)	-0.0473 (0.178)	-0.0004 (0.181)	0.100 (0.172)	-0.0503 (0.180)	-0.0350 (0.173)	-0.0395 (0.178)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,162	1,162	1,162	1,162	1,162	1,162	1,146	1,162	1,162	1,162	1,162	1,162	1,162	1,162

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: I control for woreda level fixed effects. The dependent variable, youth subjective well-being is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life).

Despite using a large set of typical controls and use of multiple reference groups, I have controlled for individual unobservable personality traits that partly determine well-being. I have re-run our estimation using fixed effects (FE) model. Table 4.9 presents results from the FE models. Similar to random effects ordered model in Table 4.8, I find again that relative income deprivation has a positive effect confirming the main results of the previous findings. The only difference is that the ‘*signal effect*’ or ‘*economic externalities*’ of RD is significant when similar occupation and the composite reference group occupation with age are used. The significance of relative income deprivation vis-a-vis these reference groups could indicate that youth indeed build aspirations through their peers-their alike and occupation domains than other domains of comparisons, hence higher reference group incomes raise well-being. As argued earlier the presence of wealthy or successful colleagues of similar age and those engaged in similar occupation generate pure economic externalities and/or aspirations. Hence, living in a rich neighborhood defined in terms of occupation or geographic area raises the possibilities of positive signal (prospect) and income externalities, which in turn motivates hard work and desire to get prosper. Hence, peer effects such as similar age and occupation are important mechanisms through which youth aspirations are built. The positive and consistent effect of relative income deprivation on SWB, both for the whole sample and for subgroups analyses, using other reference groups further supported this argument. For such effect to prevail and consistent, one expects that aspirations based on peers standard of living would increase over time. I observe this via a significant and increasing trend (i.e. year fixed effect) in our results. It should be noted here that, though results suggest towards the ‘*signal effect*’ or ‘*economic externalities*’ resulting from aspirations based on the performance of peers, I cannot preclude altruism. Given the strong social capital in rural areas, there could be some possibility of altruistic feelings toward other youth in the domains: similar occupations and in similar age groups.

Table 4.9: Fixed effects estimation results from objective measures of RD: All youth

VARIABLES	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(10)	(12)	(13)	(14)
	Benchmark	AGE	YOUTHTYPE	EDUCATION	RELIGION	VILLAGE	KEBELE	WOREDA	LAND	OCCUPATION	OCCUP_AGE	WORE_AGE
		<i>Socio-demographic</i>				<i>Geographic area</i>			<i>Economic</i>		<i>Composite</i>	
Income RD	-	0.170 (0.150)	10.84 (21.80)	0.213 (0.154)	0.151 (0.155)	0.0240 (0.157)	-0.0340 (0.159)	0.160 (0.158)	0.0823 (0.134)	0.284* (0.151)	0.0193* (0.0115)	0.217 (0.157)
Log(income per capita)	-0.00853 (0.0446)	0.0778 (0.0883)	-0.00176 (0.0467)	0.100 (0.0904)	0.0670 (0.0895)	0.0106 (0.0909)	-0.0255 (0.091)	0.0712 (0.0905)	0.0303 (0.077)	0.132 (0.0867)	0.000968 (0.0449)	0.101 (0.0904)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household controls	NO	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	1,162	1,162	1,162	1,162	1,162	1,146	1,162	1,162	1,162	1,162	1,162	1,162
R-squared	0.611	0.612	0.611	0.612	0.611	0.616	0.611	0.611	0.611	0.613	0.613	0.612

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Note: Dependent variable, youth subjective well-being is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life). The positive impact of relative income deprivation²⁹ on life satisfaction is strengthened by the introduction of controls of household head characteristics such as age, education, and marital status. Since I did not find significant variations in social and non-income RD between baseline and end line, I could not compute the FE estimates for these variables.

²⁹ It's interesting to note that in the xtlogit model the coefficient of RD2 (age) remain positive but insignificant while RD remain significant at 10%. Y remain positive while YY turns negative but insignificant. Using occupation as RG, RD turns strong sign RD2 sign at 12% (both positive), PCI positive and strong sign while YY negative and sign at 5%. With the composite occup_age RG, RD negative and RD2 positive but both insignificant, Y negative and YY2 positive and sign at 10%. Using OLS-FE and occupation as RG, RD positive and sign at 5%, RD2 negative and insignificant, Y positive and YY2 negative both insignificant. However OLS-FE, results in RD negative and RD2 positive both sign at 5% while Y is negative and YY2 positive and both significant at 5%. The subgroup analysis is also the same for members but varies for youth household head.

Robustness checks: subgroup analyses and controlling for other attributes

The use of various definitions of reference groups, individually and in combination, as well as FE estimations, which I presented earlier, is one method of robustness checks. Since the nature of our dataset allow us to deal with the potential endogeneity of income, non-income, and social comparisons; I carry out also direct comparisons of the differences across reference groups by disaggregating the different dimensions of relative deprivation for the subgroups. Empirical evidence indicates that the relationship between SWB and relative deprivation may differ across subgroups or gender (Akay et al., 2012; Anderson et al, 2014). However, Akay and Martinsson (2012) and Georke and Pannenberg (2015) do not observe gender differences. I investigate whether this is the case with respect to our youth samples. In addition, I further split our sample into members and youth household heads to test whether the effect of relative deprivation on SWB varies with age groups and marital status. The main results for subgroups are reported in Table 4.10.

The sign and significance of absolute income for male and female subgroups do not differ across all the reference groups except when education reference group is used (Table 4.10, panel A and B). It is interesting to note that the effect of absolute income on SWB turns significant for young men vis-à-vis *education* when parental factors are controlled for, an indicator of latent demand for education. While I find a consistent strong positive association between relative income deprivation and life satisfaction for male and female subgroups, the effect is negative for male subgroups for the reference groups *the same village and kebele* (Panel A). However, I observe that the magnitudes of the effects of relative deprivations on SWB differ across subgroups: gender and youth type. For instance, I observe a stronger and positive effect of relative income deprivation for female subgroups (Panel B). For female subgroup, the effect of relative income deprivation on SWB is positive and significant as well as higher in magnitude than for male subgroup, for all the reference groups except for *education* and *youth in the same kebele*, which affirms the strong *signal effect* of rural income for young women than men. Kingdon and Knight (2007) also find similar evidence in South Africa.

It is also interesting to note that the effect of relative income deprivation is stronger in females' model than in males' model vis-a-vis the reference groups: land size and livestock holding. This clearly implies that for a female such resource inequalities do matter most. Whereas the effects of non-income RD is either positive or negative for young men and women depending on the reference groups used, its significant in education domain for male and significant in the occupation domain for females. The insignificant effect of non-income relative deprivation in many domains may be partly explained by the strong family bond (or relationship) youth have within a household. Traditionally, males get strong family support in education domain than females, and females are encouraged in the work domain. Males get also strong family support than females' household resources such as livestock and land to start independence life as well as share other resources. This might weaken the effect in the males'

models. However, the opposite is true for female youth. The impact of social relative deprivation on SWB is consistently negative in all the models for male and female subgroups, though statistically and strongly significant for male subgroups. Hence, the effect of social capital on SWB is more pronounced in the males' life satisfaction than in females'.

The magnitude and direction of the relationship between the different dimensions relative deprivation and SWB also differ between youth category (members vs household head). Contrary to Georke and Pannenberg (2015) who find a stronger effect of relative income for older individuals in Germany, I find a stronger effect of relative deprivation among youth members, which suggest again the important role of relative deprivation for SWB among younger people. For youth who live with their parents and singles (i.e. younger youth), relative deprivation matters most in their well-being assessment when they compare themselves with their friends (their alike), their geographical areas (youth in their village, kebele, and woreda), and size of land and livestock holdings. For youth who are household heads, the effect of relative deprivation is significant within economic reference groups: education, land size and livestock domain. Furthermore, I have re-run the analyses, to check the robustness of our results by dropping some of the explanatory variables highly collinear with social and non-income deprivations. I find consistent estimates. Furthermore, I re-estimated all the models and the different specifications across all the reference groups by including additional controls such as leisure time and time that each youth spent caring for others such as younger siblings and ill household members that is potentially confounded with rural income. While the former has a positive and significant effect on SWB, the later has a negative effect. Interestingly, the addition of these variables does not change our results and conclusions. Finally, using a large set of controls, including personal traits, parental characteristics (both fathers' and mothers' attributes) and woreda heterogeneity strengthen our conclusions (Table 4. 10, Panel C). The uses of alternative specifications and measurement approaches to relative deprivation and SWB have also given us an additional advantage to confirm our main results (results not reported here).

The signs of other socio-economic and demographic determinate of SWB for the male and female subgroups across all the reference groups remain unaffected except for land size and birth order (see Appendix Table A4.3). However, the significance and important variables determining SWB of male and female youth substantially differ. For young men, positional goods such as mobile phones, social capital, and size of livestock holding are the main determinants of SWB. On the other hand, birth order, number of female youth members in the household, water source during dry seasons, land per capita, and land ownership certificate, education of household head and availability of youth project are found to determine SWB of young women. For both male and female subgroups estimated separately, I find an inverse U-relationship between the age of youth and SWB. Furthermore, the effect of livestock holding is positive and stronger in the male models. For the female models, access to drinking water during dry seasons is more important. These two are in line with the expectations given the role of the two variables in the well-being of young men and women. For male youth, livestock, an indicator of

social status, plays an important role for entry into the marriage market; while for female youth, fetching water is considered as their main daily routine.

As a final robustness check, I use residuals from income equation as a reference income and find these residuals to have positive and significant effects on life satisfaction. However, when both income and reference income (residual from income equation in this case) used together (using similar approach) in the life satisfaction regression, I find a significant effect and with opposite signs. Predicted income, in this case, is interpreted as the income that youth expect given their own and household characteristics, and relatively to the characteristics of the reference groups (results not reported here). Hamermesh (1977) for the former and Clark and Oswald (1996) for the later with a sample of British employees find similar results. Now let us turn to discuss the effects of subjective measures of relative deprivation on SWB.

Table 4.10: Random effects estimation results from objectives approach: Male and female youth

VARIABLES	(1) Benchmark	(2) AGE	(3) YOUTHTYPE	(4) EDUCATION	(5) ETHNIC	(6) RELIGION	(7) VILLAGE	(8) KEBELE	(9) WOREDA	(10) LAND	(11) TLU	(12) OCCUPATI ON	(13) OCCUP_AGE	(14) WORE_AG E
Panel A: Male youth														
Income RD		0.487 (0.421)	631.9** (293.8)	0.626 (0.440)	0.448 (0.435)	0.433 (0.435)	-0.00576 (0.437)	-0.158 (0.444)	0.377 (0.444)	0.193 (0.439)	0.281 (0.453)	0.729* (0.430)	0.0633*** (0.0103)	0.382 (0.447)
Log(income per capita)	0.149 (0.126)	0.356 (0.254)	0.151 (0.126)	0.428* (0.258)	0.339 (0.261)	0.333 (0.261)	0.150 (0.263)	0.0624 (0.266)	0.300 (0.260)	0.221 (0.249)	0.257 (0.257)	0.456* (0.251)	0.166 (0.129)	0.305 (0.257)
Social RD		-0.450** (0.185)	61.02 (49.69)	-0.279 (0.453)	-0.500*** (0.187)	-0.485*** (0.187)	-0.262 (0.162)	-0.263 (0.174)	-0.451** (0.189)	-0.401** (0.191)	-0.292 (0.181)	-0.480** (0.191)	-0.451** (0.190)	-0.384** (0.180)
Non-Income RD		-0.204 (0.448)	-16.44 (225.2)	-0.498*** (0.187)	-0.226 (0.461)	-0.353 (0.467)	-0.130 (0.495)	-0.277 (0.539)	-0.113 (0.503)	0.0922 (0.453)	0.640 (0.396)	-0.426 (0.384)	-0.333 (0.434)	0.0960 (0.435)
Non-income	0.0288 (0.163)	-0.120 (0.299)	0.0447 (0.164)	-0.154 (0.302)	-0.131 (0.301)	-0.212 (0.315)	-0.0627 (0.349)	-0.140 (0.364)	-0.0570 (0.327)	0.0615 (0.299)	0.395 (0.278)	-0.233 (0.259)	-0.200 (0.301)	0.0685 (0.294)
Social capital	0.328** (0.153)	-0.173 (0.250)	0.320** (0.154)	-0.235 (0.252)	-0.242 (0.253)	-0.224 (0.252)	0.0334 (0.245)	0.0129 (0.251)	-0.184 (0.254)	-0.132 (0.259)	0.00270 (0.245)	-0.214 (0.256)	-0.174 (0.251)	-0.108 (0.253)
Observations	743	743	743	743	743	743	733	743	743	743	743	743	743	743
Panel B: Female youth														
Income RD		0.826* (0.497)	49.36* (27.75)	0.709 (0.471)	0.844* (0.483)	0.830* (0.491)	0.827* (0.475)	0.434 (0.480)	1.019** (0.499)	1.290*** (0.471)	1.530*** (0.501)	1.075** (0.517)	1.684* (0.885)	1.038** (0.508)
Log(income per capita)	-0.00992 (0.161)	0.467 (0.338)	0.0519 (0.186)	0.403 (0.326)	0.463 (0.322)	0.452 (0.321)	0.448 (0.319)	0.222 (0.312)	0.549* (0.322)	0.708** (0.326)	0.813** (0.326)	0.614* (0.339)	0.374 (0.253)	0.573* (0.334)
Social RD		-0.200 (0.177)	-91.26 (85.08)	0.554 (0.429)	-0.219 (0.187)	-0.202 (0.188)	-0.136 (0.169)	-0.0621 (0.177)	-0.173 (0.189)	-0.0950 (0.196)	-0.0907 (0.189)	-0.145 (0.185)	-0.130 (0.173)	-0.230 (0.186)
Non-Income RD		0.461 (0.457)	-80.60 (122.0)	-0.212 (0.188)	0.467 (0.440)	0.291 (0.435)	0.0640 (0.460)	-0.206 (0.573)	0.000279 (0.459)	0.514 (0.454)	0.630 (0.412)	0.644* (0.365)	0.485 (0.450)	0.367 (0.418)
Non-income	0.0608 (0.155)	0.338 (0.323)	0.0438 (0.155)	0.407 (0.319)	0.352 (0.322)	0.248 (0.325)	0.111 (0.366)	-0.0819 (0.440)	0.0610 (0.340)	0.355 (0.329)	0.448 (0.309)	0.407 (0.252)	0.351 (0.319)	0.299 (0.316)
Social capital	0.218 (0.167)	-0.0301 (0.288)	0.212 (0.166)	-0.0356 (0.295)	-0.0421 (0.291)	-0.0247 (0.295)	0.0505 (0.282)	0.150 (0.285)	0.0142 (0.299)	0.103 (0.304)	0.0904 (0.287)	0.0508 (0.291)	0.0736 (0.279)	-0.0536 (0.295)
Observations	419	419	419	419	419	419	413	419	419	419	419	419	419	419

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The effect of RD on SWB gets stronger when I control for both fathers and mothers characteristics, instead of using household head characteristics. It indicates also that failure to include both fathers and mothers characteristics underestimate (and biases downward) the effects of RD.

Table 4.10. Continued

Panel C: father and mother characteristics are controlled														
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Benchmark	AGE	YOUTHTYPE	EDUCATION	ETHNIC	RELIGION	VILLAGE	KEBELE	WOREDA	LAND	TLU	OCCUPATION	OCCUP_A GE	WORE_A GE
Income RD	-	0.949**	63.99***	0.954**	0.875**	0.892**	0.866**	0.861**	0.924**	0.805**	1.054**	1.156***	0.740	0.963**
		(0.402)	(23.97)	(0.392)	(0.393)	(0.402)	(0.351)	(0.365)	(0.412)	(0.386)	(0.419)	(0.432)	(0.669)	(0.412)
Log(income per capita)	0.283*	0.711***	0.354**	0.717***	0.656**	0.665**	0.659***	0.653***	0.675**	0.650**	0.768***	0.809***	0.403*	0.696**
	(0.149)	(0.268)	(0.153)	(0.262)	(0.257)	(0.259)	(0.246)	(0.251)	(0.269)	(0.257)	(0.266)	(0.276)	(0.207)	(0.273)
Social RD	-	-0.641***	38.08	-0.416	-0.682***	-0.649***	-0.422**	-0.418*	-0.573**	-0.540**	-0.475**	-0.589**	-0.554**	-0.698***
		(0.240)	(55.12)	(0.439)	(0.245)	(0.246)	(0.210)	(0.218)	(0.233)	(0.231)	(0.231)	(0.239)	(0.236)	(0.243)
Non-Income RD	-	-0.480	140.7*	-0.709***	-0.353	-0.528	-0.187	-0.362	-0.500	-0.218	0.0853	0.0394	-0.478	-0.252
		(0.464)	(79.06)	(0.239)	(0.450)	(0.431)	(0.457)	(0.540)	(0.456)	(0.438)	(0.392)	(0.380)	(0.453)	(0.452)
Non-income	0.110	-0.218	0.127	-0.196	-0.160	-0.279	-0.0570	-0.163	-0.249	-0.0722	0.124	0.0927	-0.219	-0.109
	(0.183)	(0.317)	(0.184)	(0.320)	(0.326)	(0.329)	(0.372)	(0.425)	(0.345)	(0.319)	(0.307)	(0.276)	(0.316)	(0.342)
Social capital	0.327*	-0.444	0.304*	-0.521*	-0.470	-0.424	-0.169	-0.157	-0.339	-0.324	-0.229	-0.364	-0.321	-0.513*
	(0.171)	(0.309)	(0.172)	(0.310)	(0.307)	(0.307)	(0.297)	(0.304)	(0.302)	(0.301)	(0.297)	(0.310)	(0.302)	(0.309)
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	531	531	531	531	531	531	526	531	531	531	531	531	531	531

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: The effect of RD on SWB gets stronger when I control for both fathers and mothers characteristics, instead of using household head characteristics. It indicates also that failure to include both fathers and mothers characteristics underestimate (and biases downward) the effects of RD.

4.5. Subjective measures of relative deprivation and subjective well-being

Since I use the same sampling producers, sample size, and characteristics of respondents described earlier in section 4.1 here as well; I only present the description of data set used in the subjective measurement of relative deprivation, an alternative approach to an objective measure of relative deprivation.

4.5.1. The data

In the subjective approach to the measurement of relative deprivation, I categorize relative deprivation along two dimensions only: income relative deprivation and social relative deprivation. I use direct information on the intensity of income comparisons (i.e. self-reported relative income deprivation-subjective income RD) and social comparisons (i.e. perceived relative social standing-subjective social RD) for the different reference groups collected in 2011/11 and 2014/15 and relate these two dimensions of RD with the outcome variable, SWB. In 2014/2015, youth respondents are asked: “Which of the following comparison indicators (object of relative comparisons) are used by you when you compare your life situations with that of others?” Respondents are requested to respond either ‘yes’ or ‘no’ to the list of income and social comparison indicators provided to them. If a respondent is found to respond ‘yes’ to the list of comparison variables (income and social capital indicators), the following follow-up question was asked to find out how and where they position their social status for the two comparison variables, across seven reference groups. Accordingly, questions relating to the seven reference groups followed directly afterward, “How would you describe or position your gross income [for income relative deprivation], social status [for social relative deprivation] in comparison to [the different reference groups]?” Respondents are offered a seven-scale, ranging from “the top (richest) (1) to the bottom (poorest) (7)”, the scales in a reverse order, for income comparisons, and a five-scale, ranging from “least connected, least respected, or not proud, all coded as strongly disagree (1) to the well connected, well respected, very proud, all coded as strongly agree (5)” for social capital comparisons. Respondents are also requested to recall their socio-economic status compared to their peers: three years ago and one year ago. If the respondents are not willing to respond to the list of the comparison variables, follow-up questions are not asked. Prior to these questions, respondents are asked whether and how socioeconomic status comparisons would affect life satisfaction. Questions used in the survey to probe the potential pathways through which relative deprivation may affect well-being are further discussed during FGD to understand the relevance of such relationships.

In the elicitation of both income and social relative deprivation across the self-identified reference groups, the reference groups used are presented in subsequent orders for each respondent per each dimension of relative deprivation. Since the survey contains 7 reference groups presented one after the other, the possibility of order effect in their responses is unavoidable which can be caused either by learning or fatigue

or wish to be consistent. To reduce this bias, I randomized the order of the presentation of the reference groups. The same is true also with the use of the comparison indicators of relative deprivation. In addition, dropping the non-income dimensions of RD from the series of questions and reducing the number of reference groups to 7 has also helped to reduce the burden and confusion for the respondents.

The same outcome variable-subjective well-being presented earlier is also used here. In what follows, I begin by presenting the descriptive results from the subjective data.

4.5.2. Descriptive results from the subjective measures of relative deprivation

The lowest subjective relative deprivation score is obtained when youth compare the income of their household with the income of others in their village. The highest subjective relative income deprivation score is found using land size and education reference groups. As stated earlier, this is partly because of the fact that land is one of the necessary factors of production for youth participation in agriculture and core to well-being. In line with this finding, FGD results indicate that education is the most commonly used social status indicator among youth in the study areas (Table 4.11).

The descriptive results from subjective measure suggest that the two dimensions of subjective RD differ significantly by gender and youth category mainly for economic reference groups. For instance, I compare the results of the income and social relative deprivation scores across the reference groups: land size and size of livestock holding for male youth and female youth, and for youth household head and youth members. Income relative deprivation score vis-a-vis the size of land holding suggest that female youth feel relatively more deprived compared to their male counterparts (Table 4.11); the same is true between members and youth household heads: members feeling more deprived compared to youth household heads. Comparison of social relative deprivation scores between the two types of groups (male and female; and members and household heads) using size of livestock holding as a reference group also suggest that male youth regard social comparisons more important than female youth; and youth household head regard social comparisons more important than youth who are household members. This heterogeneity of the importance of economic comparisons among different youth groups has important implications for poverty reduction, marriage market, and participation in agriculture. In addition, the significant role of economic comparisons in youth welfare compared to other comparison groups indicate the fact that beyond economic domains, non-monetary domains also matter in well-being analyses. For instance, social comparisons are also necessary in capturing the prevalence and effect of relative deprivation for both male and female, and for youth household heads and members. Furthermore, the figures also reconfirm that relative deprivation is multidimensional and that it is important to carefully and differentiate the impact of each dimension and their implications (Table 4.11).

Table 4.11: Self-reported mean values of subjective relative income and social deprivation across gender and categories

Dimensions	Reference groups								
	Socio-demographic reference groups			Geographical areas reference groups			Economic reference groups		
	AGE	YOUTHTYPE	EDUCATION	VILLAGE	KEBELE	WOREDA	LAND SIZE	TLU	OCCUPATION
Panel A: All youth									
Income RD	3	3	4.46	3	3	4	5	3*	3
Education RD	4.48	4.48	-	4.48	4.48	4.48	4.48	4.48	4.48
social RD*	2	3	3	2	2	2	-	-	3
Panel B: Male youth									
Income RD	3.4	3.4		3.11	3.52	4.20	4.02	-	3.37
Social RD	2.38	2.38		2.30	2.25	2.60	-	0.90**	2.86
Panel C: Female youth									
Income RD	3.35	3.35		3.19	3.61	4.24	4.78	-	3.36
Social RD	2.36	2.36		2.23	2.34	2.22	-	0.85**	2.84
Panel D: Youth household head									
Income RD	3.38	3.38		3.15	3.57	4.22	3.06	-	3.34
Social RD	2.46	2.46		2.22	2.56	2.56	-	0.96**	2.87
Panel E: Youth members									
Income RD	3.39	3.39		3.14	3.55	4.21	4.85		3.34
Social RD	2.34	2.34		2.27	2.33	2.22	-	0.85**	2.78

Note: social RD is on a five-point scale, 1 strongly disagree and 5 strongly agree; ** means dummy i.e. comparison is important if yes and 0 otherwise.

4.5.3. The framework and econometric methods: subjective measures of RD

As stated earlier, given the ordinal nature of SWB, the ordered probit or logit specification would be employed in regression. Hence, our default model specification considers SWB as latent:

$$\begin{aligned}
 SWB_{it}^* &= \rho_{absolute} \log(Y_{it,h}) + \rho_{relative} \log(SRD^r(Y_{it})) \\
 &+ \gamma_{absolute} S_{it} + \gamma_{relative} SSD^r(S_{it}) \\
 &+ Z'_{it} \theta + \sigma_k + u_{it}
 \end{aligned} \tag{4.13}$$

Where SWB_{it}^* is the self-reported SWB of youth i on a scale of 1 to 9; $Y_{it,h}$ is absolute income per capita of youth i ; $SRD^r(Y_{jt})$ is the self-perceived rating of relative income deprivation of youth i on a subjective scale with respect to reference group, r ; this is a subjective assessment of individual's own ratings which is informative of the position of the individual in the income or wealth rank without taking into account the distances in income or wealth; S_{it} is an index which denotes social status, computed using PCA; $SSD^r(S_{it})$ is a self-reported social relative deprivation of youth i on a subjective scale with respect to reference group, r (i.e. the rank which is informative only of the position of the individual in the social rank); $(\cdot)_{absolute}$ and $(\cdot)_{relative}$ are parameters for absolute and relative to be estimated, respectively; Z'_{it} is a vector of

individual and household characteristics; and u is the error term. In the estimations, similar to the objective approach, I employ a number of different specifications to test the robustness of our results. For instance, I include the father and mother characteristics, and interaction terms to the above specifications (4.13) expressed as follows:

$$\begin{aligned}
SWB_{it}^* &= \rho_{absolute} \log(Y_{it,h}) + \rho_{relative} \log(SRD^r(Y_{jt})) \\
&+ \gamma_{absolute} S_{it} + \gamma_{relative} SSD^r(S_{jt}) + \tau_{absolute} NI_{it} + \tau_{relative} NID^r(NI_{jt}) \\
&+ \omega F_{it} + \mu M_{it} + Z'_{it} \gamma + \sigma_k + u_{it}
\end{aligned} \tag{4.14}$$

$$\begin{aligned}
SWB_{it}^* &= \rho_{absolute} \log(Y_{it,h}) + \rho_{relative} \log(SRD^r(Y_{jt})) \\
&+ \gamma_{absolute} S_{it} + \gamma_{relative} SSD^r(S_{jt}) + \tau_{absolute} NI_{it} + \tau_{relative} NID^r(NI_{jt}) \\
&+ \rho_{absolute} \log(Y_{it,h}) * Edu_{mom} + \omega F_{it} + \mu M_{it} \\
&+ Z'_{it} \gamma + \sigma_k + u_{it}
\end{aligned} \tag{4.15}$$

The effects of subjective income and social relative deprivation cannot be determined a priori, as presented earlier. The only difference is that the coefficients are interpreted as ‘‘status’’ or ‘‘signal’’ effect of rank considerations; i.e. relative rank considerations in income and social capital. In the econometric specifications and estimations, I follow a similar procedure with that of van Praag and Ferrer-i-Carbonell (2008). Accordingly, I regress self-reported relative deprivations on SWB of youth controlling for other covariates such as absolute income and other socio-economic factors presented earlier, including parental characteristics. Income is entered in the analyses as the logarithm of the income per capita computed from all sources including government transfers, as indicated earlier.

4.5.4. Econometric results from the subjective measure of relative deprivations

Benchmark results

Again, our estimation results of the benchmark model using subjective approach and specification indicate that the signs and significance of the parameters for the standard economic and socio-demographic variables are similar to the findings I obtain using the objective approach. The most common factors found to have significant impacts on SWB of youth include household income per capita, the age of youth, youth relationship to head, having separate cash income, access to drinking water during dry seasons and education of household head. Using these specifications and approaches, I find an inverted U-shape relationship between SWB and age of the youth, with the maximum around 49 years. Since the interpretation of the results is already provided under objective approaches; I focus on the analyses of the impacts of income and social subjective RD on SWB, measured using rank considerations, rather than distance, across seven reference groups in more detail below.

Subjective income relative deprivation

Initially, various specifications of Eq (4.13) are estimated using seven reference groups discussed earlier but I report only for selected ones. I observe a systematic impact of the different dimensions of both absolute income and relative deprivation (income relative deprivation and social relative deprivation) on SWB across all the reference groups (Table 4.12).

Unlike the objective measurement approach to relative deprivation, the results from subjective approach indicate that relative rank (income) comparisons are strongly and negatively affecting SWB across all the reference groups used, with the highest negative effect vis-a-vis the reference groups: the same village and kebele. Youth who perceive that their relative income or their household's income rank is one unit lower on the 1 to 5 scale to other youth in the same village is associated with approximately 0.856 lower satisfaction rating (measured on a 1 to 9 scale). Thus, the relatively deprived youth exhibited a lower level of SWB. The effect of perceived income deprivation is the lowest for the reference group-size of land holding (Table 4.12). This is partly due to the dropping of land size in the control group because of high multicollinearity. As can be observed from the coefficients of the estimates of relative deprivation across the reference groups, income comparisons in the geographic domain tend to affect SWB more strongly than comparisons in the economic domain. One justification could be that when comparisons are rank related than the magnitude of the income gap, the effect of geographic comparisons are more important than economic comparisons. In addition, contrary to the estimates from the objective measure of relative deprivation approach, estimates from subjective relative deprivation (i.e. self-reported income comparisons) has resulted in two important issues: the magnitudes and sign of the estimates of the perceived relative income deprivation. On the one hand, the magnitudes of the perceived relative income deprivation is higher in these estimations [than in objective measure] across all the reference groups suggesting the strong "status effect" or "rank effect" of income comparisons as a determinant of youth SWB. On the other hand, the magnitudes of the estimates suggest the need for cautions in employing different measurement approaches in the analyses of SWB. For instance, while the subjective measures of relative deprivation in the context of LDCs may overestimate the real effect of RD on SWB; objective measures of RD may undermine the real effect of relative deprivation on SWB. In addition, the use of subjective measure can lead to results that differ from those reported when relative deprivation is measured objectively. Thus, the two measurement approaches to relative deprivation may result in two different policy implications. As already noted in the introduction, models that employ subjective measure (rank considerations) may predict plainly different behavior from models employing objective rank (objective measures in this case), and there is no certainty as to which type of measure, ordinal (rank) or cardinal, adequately represent people's

preferences. This finding also calls for revisiting past empirical studies and re-estimate econometric models employing a subjective measure of relative deprivation instead of the objective measure.

Subjective social relative deprivation

Similar to the estimates of objective approaches and specifications, the signs of social comparisons based on rank considerations remain negative and strongly significant across all the reference groups except for similar education, similar age groups, and youth in the same geographic areas. The more youth feel highly disconnected or disrespected in their social spectra, the less their SWB would be. The insignificant effect of social relative deprivation on SWB vis-a-vis similar education may be due to the recent 1 to 5 coordination at the school level. As stated earlier, the most common channels through which young people make frequent social contact and companionships are with their ethnic groups, colleagues, and youth of similar age group. This might weaken the negative effect of social deprivation. The insignificant effect of social relative deprivation vis-a-vis other youth in the same woreda may be explained by the fact that social connections and informal support systems are weaker when the scope of the geographic reference groups are larger (reflected by the strong significant effect of social deprivation vis-a-vis village or neighbors). The insignificant relationship between social deprivation and SWB vis-a-vis similar age groups may be explained by altruism and informal support systems from colleagues or relatives also reflected in strong significant relationship toward the reference group: youth in the same ethnicity, and youth in the same village.

Robustness checks

In this approach as well, our data set allow us to control for unobserved heterogeneity to control for individual unobservable personality traits that partly determine SWB (Ferrer-i-Carbonell and Frijers, 2004) (Table 4.12, panel C). As I did earlier in the objective approaches, I split our sample into different subgroups based on gender and re-run our analyses to explore whether our results are robust to different specifications and sub-sample across the reference groups. Table 4.12 below summarizes the results from the random effects ordered regression models and FE estimations (also re-estimated the model using FE but not reported here) for young men and women separately. In line with the specification results using the whole sample, separate analyses for young men and women indicate that the effect of perceived income comparisons on SWB is negative and statistically significant at 1%. For instance, one unit higher on the 1 to 5 scale of comparing income to other youth of the same village is associated with lower satisfaction rating (measured on a 1 to 9 scale) for young women than men (Table 4.12, Panel A and B). This suggests that perceived income and social comparisons (rank considerations with respect to the reference groups) are more important for the life satisfaction of young women than their men counterparts are. In addition, the larger

negative effect of perceived income RD on SWB of young women than men vis-à-vis geographic and occupation domains may also explain the fact that relative deprivation induces migration to distant cities or abroad (such as to Arab countries) is stronger among rural young women than men.

In line with the earlier findings, the signs of other socio-economic and demographic determinants of SWB for the two subgroups across the reference groups remain unaffected. It is interesting to note again that household head characteristics remain crucial in determining the well-being of female youth than male youth.

Table 4.12: Estimation results from subjective measures of relative deprivation

VARIABLES	(1) benchmark	(2) AGE	(3) VILLAGE	(4) KEBELE	(5) WOREDA	(6) OCCUPATION
Panel A: Male youth						
Subjective income RD	-	-1.801*** (0.240)	-2.208*** (0.271)	-1.767*** (0.238)	-1.407*** (0.179)	-1.729*** (0.239)
Subjective social RD	-	-0.0722 (0.193)	-0.379* (0.196)	-0.173 (0.258)	-0.216 (0.217)	-
Log(income per capita)	0.158 (0.125)	0.168 (0.136)	0.0665 (0.139)	0.135 (0.140)	0.106 (0.129)	0.119 (0.136)
N	743	743	743	743	743	743
Panel B: Female youth						
Subjective income RD	-	-2.471*** (0.334)	-2.558*** (0.318)	-2.321*** (0.282)	-1.639*** (0.225)	-2.497*** (0.341)
Subjective social RD	-	0.354 (0.229)	-0.587* (0.313)	0.194 (0.313)	-0.188 (0.269)	-
Log(income per capita)	0.0103 (0.161)	-0.0170 (0.172)	-0.0393 (0.182)	-0.110 (0.175)	-0.0486 (0.172)	0.0322 (0.190)
N	419	417	417	417	417	419
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes
Parental controls	No	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Panel C: FE estimates (all)						
Subjective income RD			-0.856*** (0.0624)	-0.862*** (0.0674)	-0.727*** (0.0854)	-0.733*** (0.0652)
Log(income per capita)	0.00692 (0.0438)	-	0.00488 (0.0374)	-0.00113 (0.0381)	-0.00866 (0.0410)	-0.00682 (0.0392)
Individual controls	Yes		Yes	Yes	Yes	Yes
Household controls	No		Yes	Yes	Yes	Yes
Other controls	Yes		Yes	Yes	Yes	Yes
Observations	1,162		1,160	1,160	1,160	1,162
R-squared	0.613		0.717	0.707	0.661	0.690

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Dependent variable, youth subjective well-being, is based on life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life).

Absolute income and subjective well-being

In all the models employing an objective measure of relative deprivation and in all the specifications across all the reference groups I used, I find a consistent strong positive effect of absolute income on life satisfaction (SWB) for the whole sample. This is expected considering the fact that more income per capita leads to more consumption or investment in the well-being of youth. This finding is also in line with previous empirical evidence from developed countries (Georke and Pannenberg, 2015; Ferrer-i-Carbonell and Frijters, 2004; Blanchflower and Oswald, 2004) as well as developing countries (Akay and Martinsson, 2011; Akay et al., 2012; Lelkes, 2006). The main difference between the empirical findings from developed and developing countries is the magnitude of the effect of absolute income on SWB; higher effect for poorer countries compared to rich countries. In addition, most existing studies are based on cross-sectional data, which is prone to endogeneity problems. Despite the consistent positive and significant effect of absolute income on SWB; splitting the sample into subgroups such as into male and female provided a different perspective as to the effect and direction of association of absolute income and life satisfaction in the case of subjective measure of relative deprivation (Table 4.12, panel B). For instance, the sign and significance of the effect of absolute income on SWB for male and female subgroups differ across all the reference groups in the subjective measures and specifications. While I find a consistent positive effect of absolute income on life satisfaction for male subgroups; the effect is either positive or negative (but insignificant) for the female subgroups depending on the definition of reference groups used. In other words, the heterogeneous effect of marginal utility of absolute income on male and female well-being suggests that the impact of absolute income on SWB is not the same across the different gender.

Similar to our findings, there are also a few studies that find a negative effect of absolute income on life satisfaction, the case labelled as ‘‘the case of the frustrated achievers’’– an increase in absolute income result in decrease in life satisfaction (Graham and Pettinato, 2002; Becchetti and Rossetti, 2009, the later for Germany). Though I am hesitant to conclude that the same factor is at work in explaining our findings, especially in poor countries, I suspect that sample size (small sample) in the female subgroups might have caused this. An equally important justification that is more likely in the rural context of Ethiopia is that since the negative effect of absolute income on female SWB is for the reference groups: similar age, *youth in the same village, kebele, and woreda*, cultural factors, and intra-household resource allocation methods might have caused these variations. A household may be rich or better off but a parent may not be culturally willing to invest in the welfare of young women like that of the men counterparts; as reflected by the negative effect of absolute income on the life satisfaction of young women. During FGD held with different groups, I also identify that much of the benefits such as income obtained from farm work is not fairly shared among youth members (especially among female youth) as parents control most of such resources. This, in

turn, may create welfare differences between young woman and man within a household. This line of thinking is further supported by the strong and significant effect of having independent income sources on youth well-being. In addition, the experimental results presented in the previous chapter also indicate that parents are more positional towards young men than women are. Furthermore, the stronger effect of income comparisons on SWB of young women than men discussed earlier support also this line of thinking.

4.6. Conclusions and recommendations

Studying the drivers of the well-being of the rural youth certainly deserves critical attention given the size of youth in the total population. In line with this, our work aids analyzing of the implications of relative deprivations by directly comparing the objective and subjective measures on SWB of youth in Ethiopia. I have undertaken a comprehensive investigation of the effects of the different dimensions of relative deprivation (monetary, non-monetary, and social) along with other factors on SWB of youth across various self-identified multiple reference groups. The self-identified reference groups and measurement of RD in dimensions other than income used in this study added interesting insights to the RD literature in relation to well-being, including identification of several gaps for future research in this area. I do so with novel panel data set from the agricultural potential areas in Ethiopia.

Both objective and subjective measurement approaches to RD that I employ in this study generate overall similar conclusions: relative deprivation of different dimensions along with other economic and socio-demographic factors matters for the well-being of rural youth. In contrast to past empirical works for developed countries and limited work in developing countries, our empirical results do suggest that income disparities relative to peers are a welfare relevant concern for most rural youth in Ethiopia. In addition, results suggest that taking into account the measurements of relative deprivation on SWB can significantly alter the sign and magnitude of the welfare impact of monetary RD irrespective of the choice of the reference groups. The results also indicate that decomposing the contributions of each RD would help to avoid the averaging of positive and negative income and non-income and SWB relations. This reduces the problem of aggregation of RD and poverty. Furthermore, results suggest that confining relative deprivation to monetary sphere may be misleading and doing so does not capture the real effects of relative deprivation in the well-being analyses. Thus, I should take the argument for adopting a multidimensional approach to the measurement of relative deprivation (or poverty) in welfare analyses more seriously. Moreover, apart from RDs, absolute income per capita, positional goods such as mobile phones, size of livestock holding, having separate income sources, social capital, education of household head are found to enhance SWB, whereas lack of access to clean water during dry seasons and lack of public water, age, and gender of household head is SWB decreasing. The results are robust for the subgroups regardless of the definitions of reference groups employed, the different measurement approaches used, and specifications.

Specific to the measurement of RD used, for instance, econometric results from the objective measures indicate that relative income deprivation has a positive and significant impact on SWB of youth for all the reference groups employed. The positive impact is an indication of “signal effect” or “positive external effects” - higher income of others in the reference group indicate higher prospects for youth. Relative income deprivation fosters life satisfaction by promoting a stronger pursuit for status that in turn foster accumulation of income through hard work and/or spillovers, whereas non-monetary and social relative deprivation in terms of material or social capital reduces well-being. Thus, relative income deprivation generates signal effect or economic externalities because of living with (or in) high-income reference groups. However, results from the subjective measure of RD (i.e. rank related comparisons rather than distance or money itself) suggest that SWB is consistently negatively and significantly affected by perceived income deprivation across all the reference groups controlling for other things, a higher income in the reference group reduces life satisfaction. This means that when comparisons are rank related (i.e. measurement of RD is based on respondents’ perceived relative income standing) than the magnitude of the income gaps, relative income deprivation generates the status effect. The effects of non-income and social RD in terms of material wealth and social capital remain negative across all the reference groups, irrespective of the measurement employed.

Our findings indicate that unlike the previous studies on adults in developing countries (Ravallion, 2002; Akay and Martinsson, 2012; Georke and Pannenberg, 2015), the signs and significances of RD varies with gender, youth category (or age) and choice of reference groups. For instance, the effect of RD on SWB is stronger for members or younger youth who live with their parents than for household heads, and for young women than men. This means that the effect of RD is stronger or weaker depending on the choice of reference groups, gender and marital status of youth (i.e. members vs youth household head). For instance, when land size is used as a reference group, the effect of income RD is significant and strong for youth who live with their parents and for young women suggesting that land inequalities are more serious among female youth members [that could have implications for female youth participation in agriculture]. When young men compare themselves with those having a larger number of livestock, the negative effect of social RD is stronger and significant while this is not the case for younger women. On the other hand, when young women compare themselves with those having a larger portion of land, the negative effect of social RD on their SWB is stronger and significant; while this is not the case for young men. This clearly shows the economic and social value differences and inequalities persistent across gender and within households. This difference has also important implications for marriage market. For young men, livestock is an important asset for ploughing as well as for dowry beyond its manifesto of wealth status. For young women, the land is an important economic asset. This difference is clearly reflected with the strong and

significant signal effect of relative income deprivation in the male and female models vis-a-vis the reference groups: village, ethnicity, and religion, since the marriage markets mostly work within these domains.

Moreover, our findings also shed light on the fact that though it is necessary to address absolute deprivation, it is equally necessary to consider the likely consequences of relative deprivation or inequalities among youth, especially among resource-poor young women since inequalities perpetuate poverty. Despite consistent positive and significant association between absolute income and SWB using the whole sample, splitting the sample into subgroups provided a different perspective as to the effect and direction of absolute income on life satisfaction. An increase in absolute income has different effects on the well-being of young men and women partly depending on intra-household resource inequalities, cultural factors such as favoring of male youth. The effect of absolute income is stronger for youth having father and mother, and youth from female-headed households have lower well-being compared to male headed households. In addition, the heterogeneous effect of marginal utility of absolute income on male and female, and on younger and older youth well-being suggests that the impact of absolute income on SWB is not the same across the different groups (i.e. the marginal utility of income is higher for male youth). The more the educated the father or the mother is the more well-being of the youth is. In addition, controlling for father/mother or head characteristics reduces the magnitude of the coefficient of income RD, suggesting that presence of head reduces the feeling of one's deprivation and enhances the welfare of youth. However, the experimental results presented earlier indicate that parents are more positional towards young men than women. This also means that relative deprivation better captures intra-household resource allocation disparities and complements measures of intra and inter-household inequality.

Another interesting lesson from the study is the results suggested from the direct comparisons of objective and subjective measures of RD that employ multiple reference groups. For instance, the significance of relative income deprivation toward the reference group- *all other youth in the same woreda*, suggests that a certain development policy solely motivated to raise absolute income (eg. equalisation of the rural income distribution of households or youth individuals say to stem rural-to-urban youth migration) may not be successful if the relevant reference group is woreda. For instance, raising the absolute income of individuals in the woreda will not induce less migration as far as town-village income differentials (urban-rural wage gaps) exists. Thus, implications of such policies and wishes to induce less migration may be misleading if the policy focus is to raise absolute income only. In this example, in an effort to combat rural-to-urban migration, raising absolute income level could be complemented by narrowing of urban-rural wage gap (see for example Stark and Taylor, 1991). The best example in case is the recent rising of rural-urban youth migration (both to big cities and to abroad such as Arab, Europe), despite improvements in absolute income in many many African countries. Thus, the use of multiple reference groups and relative deprivation theory

help to convey such information that cannot be captured using the conventional approaches to welfare analyses.

In summary, our findings suggest that relative deprivation is the strong predictor of the well-being of youth. Results from objective measures of relative income deprivation suggest that relatively well-off friends, neighbors or generally reference groups, leads to aspirations as a result of spillover effects from others (or positive external effects) and/or signal effect which in turn enhances hard work and quest for status. This, in turn, prompts a quest for higher wealth accumulation, resulting in higher well-being. Thus, feelings of relative deprivation, aspirations, income, and well-being evolve jointly or sequentially.

Based on the findings from the different estimations, I infer the following policy implications:

- The *signal effect* of relative income deprivation serves as future income prospects for youth and higher earnings of others in the reference group induce hard work (inducing aspirations) and foster more wealth accumulation, thus, creating spill-over effects or positive externalities. Put differently, having well-off comparison groups such as friends and neighbors are seen as a source of aspirations since the economic gains to the relatively well-off spillovers to benefit say the poor, those at the lower economic stratum. Indeed, our results suggest that significant positive external effects work through the occupation and age group comparison domains. Hence, upward income comparisons may result in higher life satisfaction. Thus, development interventions that target few people in rural areas will create significant welfare externalities-in terms of technology adoption such as productivity-enhancing spillovers, provision of local public goods, private entrepreneurship, local employment opportunities, etc. For instance, introducing new agricultural technologies such as improved varieties or new methods of production to few role model young farmers enhance technology adoption and dissemination among alike that in turn results in increased well-being.
- Despite setting strategies to reduce absolute poverty, there is a need to reduce relative poverty and resource inequalities, including income and non-income inequalities. This can be done by designing appropriate redistributive policies, especially among the very poor. Thus, the focus of governments, as well as aid donors, should move beyond reducing absolute poverty towards also reducing relative poverty. In addition, raising the absolute income of the household does not necessarily enhance the welfare of young women. Instead, it may worsen as far as intra-household resource allocation is biased towards male siblings and youth are not the beneficiaries of their labor income.
- Decomposing relative deprivation across different dimensions and use of multiple self-identified reference groups' offer better understanding of resource allocation inequality among different sexes (heterogeneity of intra-households such as investment in human capital of offspring's): daughters and sons. The effect of RD is different for members and youth household head as well as for young men

and women. Thus, relative deprivation reflects relative poverty and complements the measurement of inequality. Therefore, measurement of poverty and well-being should move beyond money metric approaches and adopt the broad measurements of inequalities and welfare.

- From the comparison of the two measurement approaches, I learn that limiting RD to income alone undermines the real effect of RD and its interrelated effect on well-being. Thus, disaggregating relative deprivation along different dimensions and use of different measurement approaches such as subjective relative deprivation in the analyses of youth well-being presents a useful complement and additional information to objective analyses of youth well-being. This suggests that I should take the argument for adopting a multidimensional approach to the measurement of poverty as well as well-being more seriously. Doing so will make methodological contributions for assessing societal conditions (within and across individuals) for improving government policy in light of well-being.
- The negative impact of relative deprivation on youth well-being can be reduced through different policy instruments: imposing taxes on status goods such as fancy mobile phones to prevent diversion of resource allocation from meeting basic needs to luxury goods; redistributive policies to reduce inequalities by creating access to productive resources such as land and livestock; etc. Access to basic resources such as land and livestock remain crucial for youth livelihood. It is also important to improve property rights especially land and land-related security for young women.
- Investment in social capital is also important. Social capital (such as the role of kinship relations, informal support systems like Debo, informal credit and saving systems from relatives or friends in smoothening shocks and bridging the deprivation of resources that would affect well-being) play an important role to enhance the well-being of youth. Deprivation in this capital significantly affects the welfare of youth as well as household. Improving social capital of youth also helps to develop human capital. Education for young women should be the policy priorities of governments in order to enhance the welfare of rural youth. The strong effect of RD vis-à-vis education suggests the strong latent demand for education partly resulting from the recent expansion of secondary and tertiary education in most rural areas.
- The expansion of rural energy, transport, irrigation and ICT infrastructure should also be at the center of the development agenda in order to harness the potential of the demographic dividend. Though lack of mobile phone among the youth is negatively related to SWB, mobile phones can serve as either status-seeking good or a device that bridge the information gap related to agriculture (such as weather forecasts and market prices). If the purpose of the mobile purchase is for competing for higher status, this may often force households to divert resources from meeting basic needs. If mobile phones are to access information, they contribute to effective information flow thereby enhancing production and marketing decisions that in turn enhances wellbeing. Recent evidence indicates that mobile phones

provide great opportunity to bridge the information gap related to agriculture and enhance the social capital of youth (Tekalign et al., 2011; Tadesse and Godfrey, 2016).

- Educating parents (especially mothers) via extension services or other means will enhance the well-being of youth. Reforms related to marriage market are also necessary for youth well-being. For instance, polygamous marriage has a significant negative effect on the well-being of youth. In line with this, the study finds that having a parent would reduce the negative impact of the feelings of one's relative deprivation.
- In designing youth development intervention, there is a need to distinguish between youth from households whose income are transitorily low and those from households' whose income are structurally trapped in low levels of welfare.

The current African population is highly dominated by youth. Future research should focus on the important role of multidimensional relative deprivation and/or inequalities in other African countries in order to understand broadly the effect of relative concerns on well-being. In addition, future research should focus on addressing the methodological challenges in measuring RD, including the development of innovative approaches to the appropriate measurement and weighting of the different components of multidimensional relative deprivation indices. Furthermore, the role of reference groups, the dynamics behind the different effects of reference groups' across gender, and life cycle patterns of relative concerns in developing countries are fertile grounds for future research. The study helps to identify the relevance and importance of the different dimensions of RD in SWB. However, in-depth research is necessary with expanded settings and social contexts to examine the importance of the concepts in developing countries. Exploring the relevance of the different dimensions of RD and its implications for the growing inequality remains to be unaddressed in the empirical literature. Future research should attempt to address the mechanisms through which relative concerns could raise aspirations without exacerbating further inequalities.

5. IMPACTS OF RELATIVE DEPRIVATION ON OCCUPATIONAL CHOICES OF RURAL YOUTH IN ETHIOPIA

Abstract

One of the channels through which relative deprivation affects human behavior is through its effect on human decisions such as occupational choices. However, there is a lack of empirical evidence in developing countries on the link between occupational choices and relative deprivation of any dimension: income, wealth, social. Specifically, literature is silent on these issues in the context of rural youth employment and engagement in agriculture. Using realized occupations and different indicators of intended occupations, I find that relative deprivation is a strong predictor of occupational choices of the rural youth and their engagement in agriculture (irrespective of the relative deprivation and occupational choice indicators employed) with an influence of the preferences and attributes of parents. Specifically, youth from relatively more deprived households (poor income groups) and least deprived households (rich income groups) are more likely to choose livelihood options within agriculture than youth from middle-income households. I find that, whereas the very poor appear locked in (informal) agriculture due to the lack of necessary resources enabling them to diversify their income sources, the rich (well off) stay or change occupations to agriculture because the incentive to move out of agriculture is low and agriculture is an investment opportunity with high return. If the exit rate is high among the middle-income groups with relatively better skills, resources and aspirations than the poor income groups, agriculture may become the workplace of the left behind, further hampering the future of agriculture and food security of the country. Our findings have implications for policies in the areas of rural employment, agricultural development, and inclusive growth and highlight the role of government interventions in addressing extreme deprivation, reaching the left behind.

Keywords: youth occupational choices; relative deprivations; subjective measures; objective measures, agriculture; Ethiopia

5.1. Introduction

The theory of relative deprivation suggests that people take actions out of a concern for relative standing. For instance, household members undertake occupational choices (decisions) not necessarily to increase the household's or own absolute income but rather to improve the household's or own relative standing (in terms of relative deprivation), with respect to a specific reference group. Recently, there is a growing body of literature from econometric studies and experimental economics (Easterlin, 1995, 2001; Clark and Oswald, 1996; Alpizar et al., 2005; Stark, 2016; Di Tella et al., 2003; Luttmer, 2004; Ferrer-i-Carbonell, 2005), social psychology (Townsend, 1987) and neuroscience (Kuo and Chiang, 2013; Beshai et al., 2017), though mostly in developed countries, that examine the effects of relative deprivation on labor supply behavior, well-being, health, and migration decisions. Surprisingly, empirical works that document the link

between occupational choices and relative deprivation of any dimension: income, wealth, social, in the context of youth in developing countries, is scarce. In fact, a few existing empirical evidence (Akay et al., 2012a; Akay et al., 2014), though inconclusive, suggest that relative deprivation is not as dominant a concern (in affecting decisions) in poor countries as it apparently is in rich ones (Carlsson et al, 2007b; Ravallion and Lokshin, 2010). This study looks for evidence in one of the world's poorest countries, Ethiopia, in the context of youth employment and the rural economy. A valid question to ask then before I establish the link between relative deprivation and youth livelihood (or occupational) choices is whether relative concerns affect human behavior (or decisions) in the context of poor countries, as the current state of the art claims. If so, do they count enough to influence certain youth livelihood choices? There is emerging empirical evidence that tries to address this first question (Akay et al., 2012; Stark, 2009; Beshai et al., 2017). I attempt to answer both, with a strong emphasis on the second question by examining the effect of relative deprivation of different dimensions on young people's occupational choices, across different time horizons and multiple reference groups. Put differently, I want to empirically test how might the notion of relative deprivation determine young people's occupational choices (such as agricultural labor participation decisions, non-agricultural labor participation decisions, migrations), with implications for the labor market, poverty, and youth development.

In this study, I focus on understanding the role of relative deprivation in shaping youth career choices (occupational choices) in a particular agricultural setting in Ethiopia. In doing so, the study draws on the seminal work of Stark (1984), Stark and Taylor (1989), Stark and Yitzhaki (1988), and Stark (2017)--which hypothesizes that household members undertake economic decisions such as migration not necessarily to increase the household's or own absolute income but rather to improve the household's or own position with respect to a specific reference group. Extending the relative deprivation theory beyond the income spheres, this present study conceptualizes relative deprivation along different dimensions: income (monetary), non-income (non-monetary) and social deprivation limiting or enhancing youth livelihood choices or decisions. Decomposing the contribution of other dimensions of relative deprivation such as non-income (asset), say land access, is important because, in an agricultural setting, access to land is one of the most important sources of household income and the main factor that could potentially determine youth participation in agriculture.

Interest in decomposing relative deprivation, (especially in terms of social status) has a long history in different disciplines such as economics (Sen, 1983), sociology (Runciman, 1966), social policy (Townsend, 1987), and Social psychology (Adler and Stewart, 2007). Cardinal measure of relative deprivation, which this study also adopted, is based on Runciman (1966)'s definition of relative deprivation suggest that relative deprivation implies not only comparisons in terms of income but also comparisons beyond income

that include indicators of prestige or power. In this study also, I will empirically distinguish relative income deprivation from other forms of relative deprivation (non-income and social) in the analyses of youth occupational choices, as I did in the previous chapter for the following reasons. In other words, unlike the existing studies that limit relative deprivation to income spheres, the study extends the analyses of relative deprivation along other two dimensions: non-income (asset or wealth) and social capital. Similar to the approaches employed in the preceding chapter, RD is measured using two approaches: objective and subjective.

First, subjective measures of relative deprivation or rank measure capture psychological dimensions of distaste for low status, and including such dimensions in the occupational choices of young people better capture how relative differences in socioeconomic conditions (i.e. both real and perceived) are associated with the behavioral determinants of youth occupational choices. However, it is also arguably to what extent social relative deprivation is independently associated with the occupational choices, adjusting for absolute and relative income deprivation. The only study I am aware of in literature that tries to decompose the associations between absolute and relative deprivation using subjective measure is a study by Elgar et al. (2016) in the context of health-obesity risk factors among Canadian youth. As I have seen in the preceding chapter, magnitude and sign of relative deprivation vary based on the choice of reference groups that will have important policy implications for youth development, especially in the context of migration policies. I employ, again in this chapter, the use of multiple reference groups in the computation of RD for the two measurement approaches and examine whether this holds in the context of occupational choices.

Second, this study adds to the existing literature by incorporating relative deprivation of young people as a complementary explanation in the analyses of occupational choices. For instance, Runciman (1966) indicates that relative deprivation has prestige and power dimensions that can contribute to perceived social vulnerability and a reduced sense of control, in turn contributing to hopelessness and apathy that could dampen aspirations or motivations. Theoretical work also points that like income relative deprivation, social relative deprivation such as power (or prestige) is another important aspect that influences young people's career choices (Powdthavee, 2009). Social relative deprivation in this context refers to the inability of youth to fulfill the expectations and pressures of family, neighbors, relatives, colleagues, and the failure to participate in customary community events or activities (Townsend, 1987) which has important implications for one's desire to pursue or achieve career goals. The impact of social deprivation on occupational choices is perhaps best captured by measures of social capital. Social capital in this study refers to social trust, cooperative relations, social belonging, and connections between the youth and parents as well as with others of comparable status and power. Each social capital indicator can act as a lever mitigating or worsening the feelings of deprivation, and relative deprivation in each indicator of social

capital can affect occupational choice outcomes. Young people respond to the feelings of relative deprivation in a number of ways: by changing their occupation, migrating, increasing their labor participation, protesting, etc. The recent youth protest in Ethiopia is a good example that shows how young people respond to increasing inequalities and rising unemployment.

Third, as noted in chapter four, recent studies have started to point out, though substantial evidence exists from developed countries such as Germany and the United Kingdom, relative deprivation helps to understand a number of factors related to life satisfaction (Becchetti and Rossetti, 2009; Hyll and Schneider, 2014). For instance, Becchetti and Rossetti (2009: 3) reported “frustrated achievers (those individuals who report higher income but lower satisfaction as compared to the past) and the concept of adaptation (whereby individuals tend to adapt quickly to a new welfare status and, by consequence, derive less utility from the same level of welfare)”. This suggests that there are reasons to believe here also that relative deprivation approaches help to understand the dynamics of youth livelihood choice strategies. Finally, disaggregating relative deprivation along different dimensions and the use of various measures of relative deprivation help to identify appropriate intervention areas including intra-family resource allocation decisions pertinent to youth job creation.

In sum, relative deprivation in all or one of the dimensions help to capture how such inequality impact occupational outcomes of the rural youth. I empirically show the impacts of such deprivations, the mechanisms through which relative deprivation affect youth’s agricultural labor participation decisions and the interactions between such dimensions. Therefore, motivated by absolute versus relative deprivation considerations, this study analyses the occupational choices of rural young people.

Given the previous discussions, the paper addresses the following research questions: 1) how might relative deprivations affect (or shape) young people’s labor participation decisions in agriculture, and migration behavior, 2) to what extent does relative deprivation affect the occupational choices of rural youth? If it does, which dimensions (income, social capital, and non-income) and a measure of relative deprivation matter most in predicting occupational choice outcomes and why? By addressing these series of questions, the paper contributes to the scant literature on the role of relative deprivation in shaping young people’s occupational choices (realized and intended occupational choices) in the context of a rural and developing economy. Such kind of analyses brings new insights into why relative concerns are becoming important for youth occupational choices in developing countries. The insights are derived from a series of econometric models estimated using youth survey, and household survey complemented with focus group discussions held in different woredas with different categories of societies.

This chapter is organized as follows. Section 2 presents a conceptual framework and briefly discusses empirical literature on youth livelihood or occupational choices. Section 3 discusses the data sources, the different measurement approaches to relative deprivation employed in this study, and the econometric estimation techniques. Section 4 reports the descriptive and econometric results. Section 5 concludes and draws some policy implications.

5.2. Conceptual framework

There are different views why and under what conditions and when would young people like to make the decisions to opt for farming (Ellis, 1998, 2000; Bryceson, 1996; Rigg, 2006; Barrett et al, 2001; Sumberg et al., 2017). The decision of youngsters or teenagers to engage in agriculture not only depends on the access to resources that person has, both tangible and intangible assets but also depends on how a person behaves in comparison to his /her references groups (relative motives). In other words, an individual feels relatively deprived when others in his comparison group earn more than what he earns-relative 'income' deprivation and individual feels relative 'socially' deprived when he/she fails or constrained to fulfil the expectations and pressures of own, family, neighbours, communities and the failure to participate in important events that could, in turn, affect livelihood choices. Relative deprivations of an individual take multiple forms or dimensions: monetary, non-monetary (such as wealth, job, education, and other facilities), social, ecological, and political. The more an individual is concerned about relative income the more he is dissatisfied or motivated that may result in a change of livelihood decisions (such as increasing labor supply in agriculture and increase labor supply in non-farm, i.e. change occupation from farm to non-farm employment), social unrest or migration.

The theory of relative deprivation (Sen, 1981; Stark and Yitzhaki, 1988; Stark and Taylor, 1991; Stark, 2010; Deaton, 2011) suggests that household members undertake occupational choices (career decisions) not necessarily to increase the household's or own absolute income but rather to improve the household's or own relative standing (in terms of relative deprivation), with respect to a specific reference group. Let utility, U , be defined on RD (of different dimensions). According to the relative deprivation hypothesis, youth employment in farming is observed if $U(RD_i^F) > U(RD_i^{NF})$, where RD_i^F is the relative deprivation associated with employment in farming (farming is chosen as a livelihood strategy) and RD_i^{NF} is relative deprivation associated with the choice of non-farm employment- any livelihood options outside farming, including schooling. Thus, individuals or households below the upper end say the income distribution may decide to leave agriculture and engage in migration to find job in non-farm jobs on the assumption that they will thereby succeed in improving their position or their household's position in the reference groups by

securing an income higher than their initial income. When an individual's or household's utility is a function of absolute income, non-income and social capital, and relative deprivation of the three dimensions arising from interpersonal comparisons, say intra-group wealth comparisons and intra-group social status (capital) comparisons, employment in farming is observed if $U(Y_i^F, RD_i^F, SRD_i^F) > U(Y_i^{NF}, RD_i^{NF}, SRD_i^{NF})$; where Y_i^F, Y_i^{NF} represents absolute income or wealth in farming and non-farm employment, respectively; SRD_i^F, SRD_i^{NF} denotes relative social deprivation associated with employment in farming and non-farm, respectively. In the same spirit with that of Schneider (2014), suppose individual or household relative deprivation depends on an objectively measured part such as RD and an individual aversion to relative deprivation such that $RD_i = RD(\sigma_i, RD_i, SRD_i)$. Suppose also that three individuals with identical RDF and RDNF and with $\sigma_1 < \sigma_2 < \sigma_3$. Under such condition, though the three individuals have the same level of relative deprivation, say in terms of social deprivation, only the third individual may engage in changing occupations or migration because of distaste for relative income deprivation.

5.3. Data and empirical estimation strategy

5.3.1. The data

The same data set used in the previous chapters, from 12 woredas of agricultural potential areas of Ethiopia, were used to test for the effects of relative deprivations along with other important variables described earlier on youth occupational choices. Description of the sample and sample selection procedures presented in chapter 1 and 2. The empirical analyses of this chapter are based on a panel survey of 1209 youth individuals (youth household heads and members who were between 13 and 34 years of age), from 521 randomly selected farming households.

Occupational choices of youth were captured in different ways ranging from binary responses (past and current realized occupation of youth) to continues (likelihood of staying or exiting agriculture and self-reported probabilities of changing occupations from either part-time or non-farm full-time farming to full-time farming, and vice versa). Occupations can be also categorized as realized and intentions. Realized occupation refers to main occupations of youth during the baseline and end line survey. Intentions refer to future participation in agriculture or non-agriculture elicited considering different time horizons (in 10, 20 and 30 years' time) during the second round of the survey (i.e. 2014/15) for youth working as (1) part-time farmer; (2) full-time farmers; (3) non-farm worker. Non-farm workers were mainly youth who engaged in business and other non-farm activities. Intentions also refer to the likelihood of moving into agriculture and out of agriculture (migration intention or propensity to migrate), considering the upper age limit of youth.

I present below the main questions presented to respondents in eliciting the different occupational choice outcomes. In 2014/15, youth respondents are asked³⁰: “*You are currently working as: (1) Part-time farmer (2) Full-time farmer (3) Full-time non-farm. From 1 to 10, what are the chances out of 10 that you would choose to work as part-time when you turn 34?*” Similar questions are asked for full-time and non-farm. Series of questions relating to change of occupation (to capture the likelihood of changing one occupation to other) followed directly afterward: “*You are currently working as a part-time farmer. From 1 to 10, how certain are you that you will be working as [full-time farmer or full-time non-farmer] when you turn 34?*” “*You are currently working as full-time non-farmer. From 1 to 10, how certain are you that you will be working as [full-time farmer] when you turn 34?*” “*You are currently working as a full-time farmer. From 1 to 10, how certain are you that you will be working as a full-time farmer when you turn 34?*” The questions are pictorially supported. I call these responses ‘subjective probabilities’. From these responses, subjective probabilities are calculated. Binary responses to participation along different time horizons to capture future occupational preferences [intention to stay in agriculture] runs as follows: “*Do you expect to remain active in agriculture in [10 years’ time, 20 years’, 30 years’ time]?*” The module further contains a subset of questions that differentiate whether future participation (occupation) strategies would be full-time or part-time; and whether it is a change of occupation, migration or maintaining the current status quo. I categorized the set of intended occupational outcomes (i.e. future occupation options for youth) at two levels: intention to stay or move into in agriculture and intention to leave agriculture or intention to migrate (move out). The first category refers to those who expect to stay or remain active in agriculture with different time horizons and for those willing to move into agriculture), given the current state of participation, denoted by the vector S. The second category refers to those who expect to leave agriculture in the future, given their current state of participation in agriculture), denoted by vector M. The vector S includes outcomes: The vector S includes outcomes:

- S1: expect to remain active (keeping current status quo) in agriculture up to 34 years,*
- S2: expect to remain active in agriculture in 10 years’ time,*
- S3: expect to remain active in agriculture over the next 20 years,*
- S4: expect to remain active in agriculture over the next 30 years,*
- S5: expect to transit or change current state of participation from either part-time or non-farm work to full-time farming (moving into),*

While the vector M consists of outcomes:

³⁰ For robustness check, I also asked occupational outcomes using Likert scale which run as follows: Do you think that you will continue farming either [as part-time or full time? 1. Very likely 2. Likely 3. Unlikely 4. Very unlikely.

M1: expect to transit current participation from part-time farming to non-farm work,

M2: expect to change current occupation from full-time farming to non-farm work.

Note that $\{S_k\}_{k=1,2,3,4,5}$ and $\{M_q\}_{q=1,2}$ are binary outcomes. However, the survey elicited the probability of the occurrence (subjective probabilities) of the binary outcomes for the outcomes $\{S_k\}_{k=1,5}$, and $\{M_q\}_{q=1,2}$, hence they are continuous, i.e. $P_{ik}(S_k = 1)$ for $k=1,5$ and $P_{iq}(M_q = 1)$ for $q=1,2$. An advantage of asking probabilistic questions relative to approaches that employ a Likert scale or a simply binary response (yes/no) is that responses are interpersonally comparable and allow the respondent to express uncertainty (Manski, 2004). To make use of such advantages, I elicited subjective probabilities using probabilistic questions for the binary occupation (participation): S_5 and $\{M_q\}_{q=1,2}$. As is the case in many standard studies that collect subjective data, a brief introduction is read and presented to the respondents at the start of the survey. In most cases, in addition to the use of pictures, practical examples are also presented and dictated back and forth. The wording of the introduction is similar to that in Zafar (2009). The full introduction used in the survey questionnaire is presented in appendix Table 4A.1. The second part of the survey collected data for a set of characteristics: of youth, their parents (fathers and mothers) and their households, that are likely to influence the future occupational choices of youth [in that choice set per the respective time horizon selected]. Data are collected also on the labor allocation of each individuals' labor time to farming, schooling, and other activities, and on household income from all sources during 2010/11 and 2014/15. Income for a household includes all sources of income farm production (on-farm and off-farm), petty trades, transfers, gifts, rental income (again the detail computation on this is presented in chapter three).

Realized and intended occupations or livelihood strategies available to youth (as described earlier) is summarized using the following diagram (Figure 5.1).

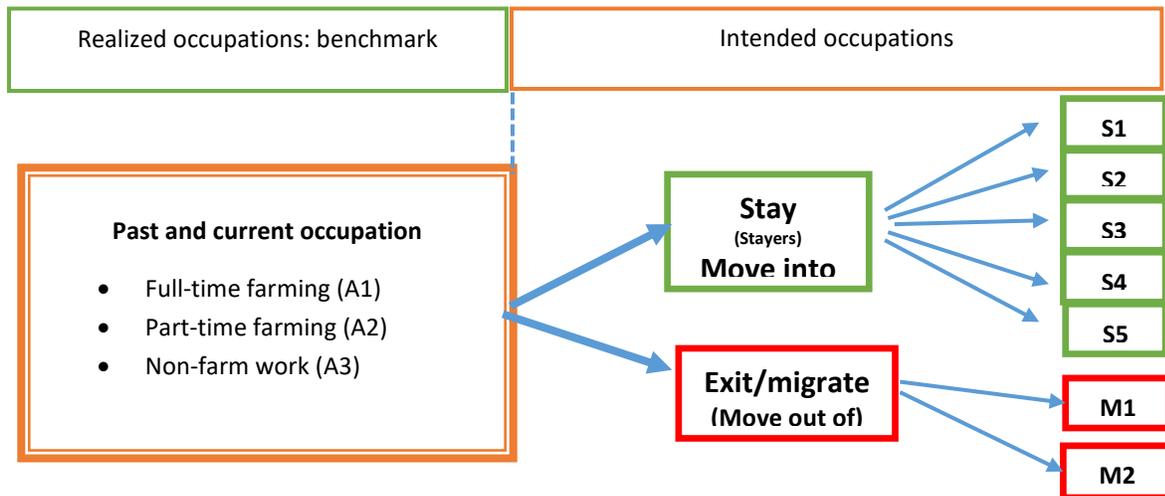


Figure 5.1: Realized and intended occupation strategies available to youth

I use the two measurements of relative deprivation (objective and subjective) for the computation of relative deprivation indices. Selected characteristics of youth, their households, and community characteristics, with respect to the different categories of youth's occupations, are summarised in Table 5.1.

Table 5.1: Selected realized and intended occupational choices of youth and household characteristics

	Part-time farmer	Full-time farmer	Non-farm worker
<i>Realized occupation: current and past</i>			
(Realized past) main occupation (in 2010)	0.42	0.42	0.12
(Realized current) main occupation (in 2015):	0.35	0.51	0.14
<i>Intended occupational choices</i>			
Continue current status quo until turning 34 [S1]	0.49	0.65	0.71
Transit from part-time to full-time until turning 34 [S5]	-	0.41	-
Transit from non-farm to full-time until turning 34 [S6]	-	0.33	-
Transit from part-time to non-farm worker until turning 34 [M1]	-	-	0.68
Transit from full-time to non-farm worker until turning 34 [M2]	-	-	0.47
Remain active in agriculture in 10 years' time (Yes=1) [S2]	0.45	0.76	0.21
Remain active in agriculture in 20 years' time (Yes=1) [S3]	0.20	0.59	0
Remain active in agriculture in 30 years' time (Yes=1) [S4]	0.17	0.42	0
<i>Youth characteristics</i>			
Sex (Male=1)	0.49	0.78	0.32
Age (in years)	18.28	24.67	20.21
Birth order	3.46	3.23	3.42
First born (Yes=1))	0.24	0.27	0.42
<i>Household characteristics</i>			
Per capita income (in 2015 birr)	2668	2290	2065
Livestock holding (in TLU) (in 2015)	11.62	8.04	7.96
Land size per household (ha) (in 2015)	2.23	1.60	1.68
Land size per own children (ha) (in 2015)	0.59	0.51	0.45
Observations	320	321	19

Source: survey results. Current occupation refers to occupation of youth at the time of end line survey (2015)

5.3.2. Empirical estimation strategy

I estimate the impacts of (household) relative deprivations on a host of occupational choices described earlier. For ease of reference, the selected outcomes on occupational choices presented above are classified into seven categories: S1, S, S3, S4, S5, M1 and M2. The estimation strategy and presentation of results are as follows. In the case of each outcome for the seven categories of occupational choices, I estimate three parameters of interest (income, non-income, social RD). The general procedures adopted here is to have different model specifications for each outcome variable (S1, S2, S3, S4, S5, M1, M2) (i.e. based on participation categories) against multiple reference groups. Accordingly, I run series of regression models on these different specifications that employ multinomial logit, probit, and OLS based on the nature of outcome variables. I use multinomial logit models to estimate the effect of relative deprivations (measured using objective and subjective) on youth's realized labor supply decisions. These estimations serve as benchmarks. The probit models are used estimate the effect of relative deprivations on binary intended

occupation outcomes such as the probability of staying in agriculture until youth turn 34 (i.e. S1), and in the coming 10 (i.e. S2), 20 (i.e. S3) and 30 (i.e. S4) years' time. The OLS regression models are used to estimate the effect of relative deprivations on the probability of changing occupations³¹ from part-time and non-farm to full-time farming (i.e. S5), and from part-time and full-time farming to non-farm work (i.e. M1-M2). First, the estimation of interest is the effect of (household's) relative deprivations on youth's (actual) occupations (such as labor participation decisions in agriculture and non-agriculture, i.e. A1-A3) and I examine each outcome with specifications presented below.

5.3.2.1. The effect of relative deprivation on realized occupations

The benchmark specification, against which the results of the intended occupational choices are compared, is the response probabilities from the multinomial logistic regression with random effects that uses youth's realized labor participation decisions. In other words, while the response variables in our benchmark models are based on youth's realized occupations (i.e. main occupation at the time of first and second round survey); the response variables for the comparison models are based on intended participation decisions in agriculture in the coming 10, 20, 30 years, given their realized participation during the end line survey. Accordingly, I relate realized occupational choices to the different dimensions of RD as well as a rich set of control variables. Since the dependent variable, realized occupation, is categorical, I estimate using multinomial logistic regression models with random effects. The response probabilities for multinomial logit model with three alternatives can be specified as follows:

$$Pr(t = p|X) = \frac{\exp(X\beta_p)}{1 + \sum_{p=1}^3 \exp(X\beta_p)}, \quad p=1, 2, 3. \quad (5.1)$$

Where p denotes realized occupation of the youth (i.e. past and current alternative occupations) which include: part-time farming (A1), full-time farming (A2) and non-farm work (A3); X is a vector whose components are explanatory variables $\hat{Y}_1, \widehat{RD}_1, \hat{S}_1, \widehat{SRD}_1$ (where \hat{Y}_0 is the household's estimated income if youth household member works as part-time farmer while attending school and \widehat{RD}_1 is the household's estimated level of relative income deprivation associated with this income; \hat{S}_1 is youth's estimated social capital if the youth works as part-time farmer and \widehat{SRD}_1 is the youth's estimated level of relative social deprivation associated with this social capital), and other variables (such as individual and household level factors) that influence occupational choice of youth. Measurements of the different dimensions of RD are presented in chapter 4 and summarised in section 5.4.2. The coefficients on these explanatory variables differ for each occupation outcomes (alternatives). After testing several model specifications (using various reference groups) based on (Equ.5.1) above, I report here the model with the highest predictive power,

³¹ Measured as the probabilities that an individual choose to stay in and exit agriculture from a given set of occupational choices.

which explain best occupational choices of youth, and annex the rest. In these set of regressions, I apply three different specifications of (5.1). The first and simplest specification (1) includes, in addition to the entire set of general control variables, only youth characteristics and relative deprivation as a determinant of occupational choices. In the second specification (2), I add father and mother characteristics to the first specification. Finally, in the specification (3), I add household head characteristics to the first specification as an alternative to the use of father and mother characteristics. In developing countries where parents' expectations and roles are heterogeneous based on gender and age of their children and where there are strong links between gender roles and occupational choices, it is not possible with conventional approaches to address the question of whose attributes matter in the occupational choices of offspring. Thus, including parental attributes is an attempt to estimate (or capture) the different role of parents in the occupational choices of their children. This gives a better view of the dynamics of intra-household in shaping the occupational choices of young people, if there is significant difference between parents' and youth's preferences.

5.3.2.2. The effect of relative deprivation on the intention to stay in agriculture

An alternative approach to the above empirical estimation strategy of linking relative deprivations with occupational choices is to model the effect of intended occupational choices (or employment preferences) of youth along different time horizons. As described earlier since the alternative occupational outcome variables (S1-S4) are binary, and S5, M1, and M2 are continuous, probit model and OLS estimation techniques are used to estimate the effect of relative deprivations on occupational choices of youth, respectively.

Remain active in agriculture (S1-S4): binary outcomes

Let C_p is the current state of labor participation where $p = \{1, 2, 3\} = \{\text{part-time, fulltime, non-farm}\}$. Let S_{ik}^* is the unobserved (latent) binary outcome for the different occupation outcomes of youth i , and form an indicator function $1[\cdot]$ that takes on a value of '1' for 'yes' responses (remain active in agriculture in 10, 20, and 30 years' time) and '0' for 'no' responses. The probability of observing a 'yes' (or $S_{ik}=1$) when the youth respondent decides to remain active in agriculture for $\{S_k\}_{k=1, 2, 3, 4}$ is:

$$S_{ik}^* = \rho_0 + \log(Y_{i,h}) + \rho_1 RD_i^r + \rho_2 SRD_i^r + \theta X_i + \sigma_k + \varepsilon_i > 0 \quad (5.2)$$

Where,

$$S_{ik}^* = \begin{cases} 1 & \text{if } S_{ik}^* > 0 \\ 0 & \text{if } S_{ik}^* \leq 0 \end{cases}$$

; $RD_i^r(Y_1, \dots, Y_n) = \frac{1}{n} \sum_{j=i+1}^n (Y_j - Y_i)$, where $Y_j > Y_i$; noting that for any $j \leq i$, $\max \{Y_j - Y_i, 0\} = 0$; $SRD_i^r(SS_1, \dots, SS_n) = \frac{1}{n} \sum_{j=i+1}^n (SS_j - SS_i)$, where $SS_j > SS_i$; noting that $j \leq i$, $\max \{SS_j - SS_i, 0\} = 0$; RD and SRD denote relative income deprivations measured using either objective or subjective measures, respectively. X_i is a vector that denotes individual, household and community characteristics determining intended occupational choices of youth, given their current participation; ε_i which is the error term is assumed to be independent of the explanatory variables and has the standard normal distribution. In the case of subjective relative deprivation, I directly relate the self-reported relative deprivation and occupational choices; whereas objective RD is computed using Yitzhaki index. The sign of relative deprivation cannot be determined a priori. Positive coefficient on RD means that an increase in RD induces an increase in the outcome variable, in this case the probabilities of staying in agriculture, and if negative it means that RD induce a reduction in the propensity of stay in agriculture and, thus, relative deprivation induces propensity to migrate.

From (5.2) I can derive the response probabilities for S_{ik} :

$$\begin{aligned} P(S_{ik} = 1|X) &= P(S_{ik}^* > 0|X) = P(\varepsilon_{i,c} > -(\rho_0 + \rho_1 RD_i^r + \rho_2 SRD_i^r + \theta X_{c,i} + \sigma_k)|X) \\ &= G(\rho_0 + \rho_1 Inc_{RD_{i,c}} + \rho_2 SRD_{i,c} + \theta X_{c,i} + \sigma_k) \end{aligned} \quad (5.3)$$

G in the probit model³², is the standard normal distribution function (cdf), which is expressed as an integral:

$$G(z) = \Phi(z) = \int_{-\infty}^z \phi(v) dv, \quad (5.4)$$

Where $\Phi(z)$ is the standard normal density given as:

$$\phi(z) = (2\pi)^{-1/2} \exp(-z^2/2) \quad (5.5)$$

Where Z denotes vectors that denotes explanatory variables; predicted income (expected income), Y_i , predicted relative deprivation associated with Y_i , and vector X .

Transition from part-time or non-farm to full-time farming: continuous outcome variable (S5)

³² Alternatively we can express the probably of observing S as follows. Probit: $\Pr(S = 1|X) = \Phi(X\theta) = F(X\theta)$;

Where F is cumulative density function which is non-linear in the parameters that should be estimated using maximum likelihood estimation (MLE). The marginal effect (ME), which is the partial derivative, is given by (using chain rule):

$$ME = \frac{\partial F(X\theta)}{\partial X} = F'(X\theta) \frac{\partial (X\theta)}{\partial X} = F'(X\theta)\theta; \text{ as we can see from the derivatives, the marginal effects depend on the level of } X. \text{ Thus, marginal effects are different for each subjects.}$$

This is a conditional subjective probability in the sense that it is conditional on participation in part-time or non-farm. Therefore, the conditional analysis is for those who are part-time or non-farm and wants to change to full-time farming until age turn 34. The relationship between subjective probabilities, of changing current participation from either part-time or non-farm to full-time until turning 34, can be modeled using OLS as follows:

$$P_{ik}^*(S_{ik} = 1 | C_{p=1,3}) = \rho_0 + \log(Y_{i,h}) + \rho_1 RD_i^r + \rho_2 SRD_i^r + \theta X_i + \sigma_k + \varepsilon_{i,c} \quad (5.6)$$

Where P_{ik}^* is the unobserved (latent) subjective probability that takes the following values:

$$P_{ik}^*(S_{ik} = 1) = \begin{cases} 1 & \text{if } P_{ik}^* > 0 \text{ and } C_p = 2 \\ 0 < f < 1 & \text{if } P_{ik}^* > 0 \text{ and } C_p = 1 \text{ or } C_p = 3 \\ 0 & \text{if } P_{ik}^* \leq 0 \end{cases} \quad (5.7)$$

Where $k = \{5\}$; and the rest are as defined earlier.

The above expression states that, given an individual i who is currently working as full-time farmer; the probability of observing S5 is 1 if the youth decides to remain as full-time until he/she turns 34; between 0 and 1 if he/she decides to change occupation from either part-time or non-farm, and 0 otherwise. This outcome variable is the function of income relative deprivation, social relative deprivation and a set of control variables. The decision of youth to engage in agriculture not only depends on the individual characteristics of a youth but also on parents and community characteristics. Thus, variables that proxy these characteristics are captured and entered into the models.

5.3.2.3. The effect of relative deprivation on intention to leave agriculture

The relationship between the probabilities of changing current occupation from part-time farming or full-time farming to non-farm work and relative deprivations (i.e. the transition from part-time or full-time farming to non-farm: M1 and M2) can be modeled as follows:

$$P_{iq}^*(M_q = 1 | C_p, X) = \rho_0 + \log(Y_{i,h}) + \rho_1 RD_i^r + \rho_2 SRD_i^r + \theta X_i + \sigma_k + \omega_{i,c} \quad (5.8)$$

Where $p = \{1, 2\}$ and $q = \{1, 2\}$; $\omega_{i,c}$ is the error term; and the rest as defined above; $P_{iq}^*[\cdot]$ is unobserved (or latent) subjective probabilities that takes the following values:

$$P_{iq}^*(M_q = 1 | C_p, X) = \begin{cases} 1 & \text{if } C_p = 3 \\ 0 < f < 1 & \text{if } P_{iq}^* > 0 \text{ and } C_p = 1 \text{ or } C_p = 2 \\ 0 & \text{otherwise} \end{cases} \quad (5.9)$$

The different specifications described earlier can be summarised as follows:

$$\begin{aligned}
 & \bullet \text{ Actual occupation (benchmark) [A1-A3]} \\
 & \bullet \text{ Probability of stay in agri:10,20,30 years [S1-S5]} \\
 & \bullet \text{ Probability of move into (agri. labor entry) [M1]} \\
 & \bullet \text{ Probability of move out of (agri. labor exit)[M2]}
 \end{aligned}
 \left. \vphantom{\begin{aligned} \bullet \text{ Actual occupation (benchmark) [A1-A3]} \\ \bullet \text{ Probability of stay in agri:10,20,30 years [S1-S5]} \\ \bullet \text{ Probability of move into (agri. labor entry) [M1]} \\ \bullet \text{ Probability of move out of (agri. labor exit)[M2]} \end{aligned}} \right\} = \alpha + \rho RD + \sigma SRD + \theta NRD + \beta X + \varepsilon$$

Where RD, SRD and NRD denote income, social and non-income relative deprivation, respectively, which is measured using either objectively or subjectively.

I now turn to present descriptive statistics relevant for our econometric analyses followed by econometric results.

5.4. Relative deprivation and occupational choices of the rural youth

5.4.1. Descriptive results

Youth, fathers, and mothers are asked about whether youth under consideration would continue to work in agriculture until they turn 34 (i.e. the upper limit for youth age). Table 5.2 reports the summary results of the different responses. As one can see from Table 4.5 there are no such variations in the responses offered based on the Likert scale but slight variation in terms of subjective probabilities between youth and their parents (Table 5.3). For instance, while 40% of youth who are currently working as part-time farmers perceive (very likely and likely) that they will continue to work as part-timers. While fathers also reported similar view with that of youth, mothers are less sure (36% reported very likely and likely). I checked also the median figures of probabilities and found almost similar results with the average figures.

Table 5.2: Youth’s own and their parents’ perception about future engagement in agriculture

Continue working in agriculture until the age of 34 as (%):		Youth [n=659]	Fathers [n=291]	Mothers [n=341]
Part-time	DN	0.31	2	2
	Very likely	9	11	6
	Likely	31	29	30
	Unlikely	42	43	47
	Very unlikely	19	17	15
Fulltime	DN	1	2	<1
	Very likely	34	29	24
	Likely	38	29	45
	Unlikely	18	30	26
	Very unlikely	10	10	5
Non-farm	DN	0	6	17
	Very likely	32	29	17
	Likely	21	29	33
	Unlikely	26	24	17
	Very unlikely	21	12	16

Source: own survey results

Table 5.3: Average [subjective] probabilities of staying, moving into and moving out of agriculture

Currently working as [part-time, full-time, on-farm] and will continue working as [...] until the age of 34:	N	Youth	Fathers	Mothers	category
<i>Keeping current statusesque</i>					
Part-time farmer	320	0.49	0.45	0.42	Stay
Full-time farmer	321	0.71	0.59	0.61	Stay
Full-time non-farm worker	19	0.72	0.77	0.68	Stay
<i>Change of occupation</i>					
From part-time or non-farm to full-time farming	339	0.48	0.41	0.40	Move into
From part-time or full-time to full-time non-farm	641	0.65	0.60	0.62	Move out /exit

Source: survey result

Table 5.4 reports the relationship between income, education and other relevant social comparisons, and intended migration decisions. Irrespective of current participation status, about 60% of the sample reported remaining active (stay) in agriculture in 10 years' time (i.e. employment in agriculture as a livelihood strategy) (as high as 72% among full-time farmer youth). Amongst those, 58% of youth respondents regard income comparisons as important. Only 73% of those who do not regard income comparisons as important (with regard to their peers) are planning to stay in agriculture in the coming 10 years; strong statistical significant at the 5% level (Table 5.4). Similarly, youth regard education and infrastructure (roads, electricity, marketplaces, etc) comparisons essential for their occupational choices. I also find that there is a strong statistical relationship (at 1 % level) between youth's intention to stay in agriculture in 10 years' time and infrastructure comparisons. Similar questions are addressed to respondents along 20 and 30 years' time. Except for infrastructure comparisons, again, I find a statistically significant association between intentions to stay or leave agriculture in 20 and 30 years' time, and income and education comparisons; suggesting the importance of social comparisons in youth migration choices (Table 5.4).

Table 5.4: Income, education and infrastructure comparisons, and youth intention to stay in agriculture

Choices	Income comparison		Education comparison		Infrastructure comparison	
	Important	Not important	Important	Not important	Important	Not important
Stay_10	348(58)	47(73)	292(56)	103(75)	279 (56)	116(70)
Not stay_10	248(42)	17(27)	230(44)	35(25)	216(44)	49(30)
Total	596(100)	64(100)	522(100)	138(100)	485(100)	165(100)
	$\chi^2(1)=5.44^{**}$		$\chi^2(1)=15.88^{***}$		$\chi^2(1)=10^{***}$	
Stay_20	234(39)	17(27)	169(32)	82(59)	192(39)	59(36)
Not stay_20	362(61)	47(73)	353(68)	56(41)	303(61)	106(64)
Total	596(100)	64(100)	522(100)	138(100)	495(100)	165(100)
	$\chi^2(1)=3.95^{**}$		$\chi^2(1)=33.87^{***}$		$\chi^2(1)=0.48$	
Stay_30	190(33)	11(15)	139(27)	62(45)	158(32)	43(26)
Not stay_30	394(67)	65(85)	383(73)	76(55)	337(68)	122(74)
Total	584(100)	76(100)	522(100)	138(100)	495(100)	165(100)
	$\chi^2(1)=10.35^{**}$		$\chi^2(1)=17.25^{***}$		$\chi^2(1)=2.01$	

Source: survey results. Figures in parentheses are percentages; ***, ** statistically significant at the 1% and % level, respectively.

The average relative income deprivation (using *similar age as a reference group, for instance*) is about 1147 birr (1152 birr for youth planning to remain active in agriculture in 10 years' and 1141 birr for those planning to exit agriculture in 10 years' time). I find no significant difference between the two (Table 5.5). The average relative income deprivation for the reference groups: similar education, land size holding, and livestock holding are 0.87, 1087 birr, and 1078 birr, respectively with statistically significant difference between those who are planning to stay and those who are planning exit; highest relative income deprivation among those who are planning to exit in 10 years' time (short stayers). Hence, on average, the feelings of relative income deprivation are stronger related between staying and exiting agriculture when youth relate themselves to other youth along economic domains. Similar results are obtained for relative non-income and relative social deprivation for the same (economic) reference groups (See Table 4.6).

Table 5.5: Relative deprivation mean difference between stayers and exitors: objective measure

Dimensions RD	Stay		Not stay			All	
	Remain active in agriculture in 10 years' time						
	Mean	SE	Mean	SE	Mean difference	Mean	SE
Income RD_AGE	1151.64	29.67	1141.27	38.42	10.367	1147.48	23.32
Income RD_EDU	0.3671	0.08	1.61	0.83	-1.24*	0.87	0.33
Income RD_LAND	1042.01	30.81	1154.89	42.39	-112.88**	1087.33	25.17
Income RD_TLU	1038.44	31.86	1139.38	47.50	-100.93**	1078.98	27.01
Income RD_OCCUPATRION	1134.73	28.49	1160.14	38.94	-25.41	1144.94	23.12
Non-income RD_AGE	0.98	0.04	1.43	0.07	-1.16***	1.16	0.04
Social RD_LAND	1.94	0.98	2.38	0.13	-0.44***	2.11	0.08
Social RD_TLU	1.93	0.098	2.34	0.133	-0.45**	2.01	0.079
Observations	395		265			660	
	Remain active in agriculture in 20 years' time						
	Mean	SE	Mean	SE	Mean difference	Mean	SE
Income RD_LAND	993.41	38.11	1144.97	32.92	-151.57***	1087.34	25.17
Non-income RD_LAND	0.98	0.06	1.27	0.05	-0.288***	1.16	0.04
Social RD_LAND	2.11	0.12	2.12	0.11	-0.013	2.11	0.12
Observations	251		409			660	
	Remain active in agriculture in 30 years' time						
	Mean	SE	Mean	SE	Mean difference	Mean	SE
Income RD_LAND	971.38	42.46	1138.11	30.78	-166.73***	1087.73	54.35
Non-income RD_LAND	1.06	0.07	1.20	0.05	-0.144*	1.16	0.04
Social RD_LAND	2.13	0.14	2.11	0.10	0.023	0.17	0.08
Observations	201		459			660	

Source: survey results. ***, **, * Statistically significant at the 1%, 5% and 10% level, respectively.

Note: RD_AGE refers to relative deprivation with respect to reference group: similar age; in the same way EDU refers to similar education; LAND-size of land holdings; TLU-number of livestock holdings; OCCUPATION-other youth in the same occupation; TYPE-youth of similar status (household members, household head).

Table 5.6 presents a summary of descriptive statistics of the main variables of interest used in the regression analyses.

Table 5.6: Summary statistics of main covariates

	Mean	Std. Dev.	Min	Max
Sex of youth (1-female, and 0 otherwise)	0.37	0.48	0	1
Youth has mobile phone	0.53	0.50	0	1
Age of youth	21.44	5.87	15	34
Youth is currently attending school(1, yes; 0 otherwise)	0.37	0.48	0	1
Birth order (rank)	3.35	2.33	1	14
First born is son	0.17	0.38	0	1
Age of father	52.55	12.27	29	95
Education of father (years)	2.52	3.19	0	16
Marital status of father (1=married to single spouse, 0 otherwise)	0.90	0.31	0	1
Mother relationship to head (1 if household head, 0 otherwise)	0.40	0.49	0	1
Age of mother respondent	46.76	11.79	25	90
Education of mother respondent(years)	0.79	1.79	0	9
# of male youth in the household 13-34 years	1.29	0.93	0	5
# of female youth in the household 13-34 years	1.20	0.88	0	5
Family size	7.41	3.29	2	20
Land size holding per household (in hectares)	1.89	2.29	0.1	27.3
Land size per own child (in hectares)	0.54	0.62	0.01	9.1
Total income per household (in Birr)	17440	18714	9.3	190021
Per capita income	2502	2739	1.86	27145
Number of livestock owned (TLU)	9.78	10.10	0	86.4
Materials used to construct the roof of the main house(1-corrugated metal, 0 otherwise)	0.48	0.50	0	1
The PA has access to electricity (1 yes, 0 otherwise)	0.32	0.47	0	1
The PA has access to public pipe water	0.44	0.50	0	1
Availability of youth-related projects and programs in the kebele/woreda (1 yes, 0 otherwise)	0.77	0.42	0	1
Land registration process completed in the PA (1 yes, 0 otherwise)	0.39	0.49	0	1
Rural credit and saving institutions available in the PA (1, 0)	0.46	0.50	0	1
<i>Occupational choices: Engagement in agriculture</i>				
Continue farming either [as part-time or full time or non-farm] until the age of 34-cardinal response	0.58	0.25	0.1	1
Continue farming either [as part-time or full-time or non-farm] until the age of 34 (0. very unlikely, 1. unlikely, 2.likely, 3 .very likely)-ordinal response	1.62	0.97	0	3
The probability of changing part-time farming to full-time farming at the age of 34 (for part-time or non-farm workers at the time of interview)	0.42	0.27	0	0.9
The probability of changing full-time farming to full-time non-farming at the age of 34 (for part-time or non-farm workers at the time of interview)	0.58	0.27	0.1	1
Expected to remain active in agriculture in 10 years' time (1=yes, 0 otherwise)	0.60	0.49	0	1
Expected to remain active in agriculture in 20 years' time (1=yes, 0 otherwise)	0.38	0.49	0	1
Expected to remain active in agriculture in 30 years' time (1=yes, 0 otherwise)	0.30	0.46	0	1

Source: survey results

5.4.2. The impact of relative deprivations on realized (realized) occupational choices

Table 5.7 presents the summary results of the multinomial logistic regression with random effects for the benchmark models (i.e. realized occupations) using a subjective and objective measure of relative deprivations based on three different specifications described earlier. The first specification includes (household) relative deprivations and the relevant variables as used in literature that is expected to influence the relative return from and choices for schooling, agricultural and non-agricultural occupations. The second specification includes fathers, mothers, and youth's individual characteristics to the first specification. The final specification, include household head attributes as an alternative to fathers' and mothers' characteristics to capture the effects of parents attribute on occupational choices of their children. District dummies are included in all the specifications to control for differences in infrastructure, information, and agro-ecological conditions. I also included year dummies to control for year effects. Since I have more than one youth from the same household for some, standard errors are corrected for clustering at the household level. Part-time farming (those who attend school while working on either own farm or family farm) is the base reference occupation category. Thus, the coefficients in a multinomial model reported below are calculated and reported in relation to the base outcome (in this case part-time farming). Though it is not meaningful to interpret the estimates directly like the linear models, I use the signs (since they are informative) and the marginal effects for interpretation of the results and report the multinomial log-coefficient.

In general, the regression estimates illustrate that (household) relative deprivation have a significant effect on youth occupational choices. For instance, after controlling for individual attributes, household head and other characteristics, the effect of relative income deprivation (measured objectively) on the likelihood of choosing agriculture and non-farm employment is negative and statistically significant at 1% level for middle-income groups. According to this measure, it means that an increase in relative income deprivation reduces the likelihood of being working in agriculture and non-farm work for youth from middle-income households. It's, however, interesting to note that relative income deprivation increases the probability to choose full-time farming and part-time farming for the most deprived and rich (or well-off) youth (reflected by the positive coefficient on RD square and income square, respectively) (see Table 5.7, Panel A). For instance, on average, a one percent increase (since it's in log form) in the mean income of the reference group (in this case similar occupation and age) results in 0.91% decrease in the likelihood of choosing full-time farming compared to part-time farming).

The use of subjective measures of RD suggests that the coefficient of relative income deprivation index (visa-a-vis age reference groups) is positive which suggest that an increase of relative income deprivation increases the likelihood of choosing both farming and non-farm employment compared to part-time farming

(Table 5.7, Panel B). With everything else in the logit equation held constant, youth who feel relatively deprived in terms of income compared to other youth in the same age groups are more likely to participate in full-time farm work and non-farm work than those who feel less deprived. However, the effect is negative for part-timers. The more the youth feels relatively deprived (in terms of income rank) compared to other youth in the same age and occupation groups, the more likely to choose full-time farming than part-time farming and non-farm employment.

On the one hand, results suggest that while the poorest are locked in agriculture; youth from the richest households are considering agriculture as an attractive sector. On the other hand, it suggests that relative deprivation would force youth from middle-income households to consider livelihood options outside of agriculture and non-farm work such as investment in human capital or migration. For instance, youth attending school are optimistic about earning better through education (Bezu and Holden, 2014). This is true given the significant number of our sample youth are attending school. For instance, a one-unit increase of relative income deprivation index will increase the likelihood of schooling by about 2%. Thus, the exit rate is higher among the middle-income categories. Controlling for parental attributes, social relative deprivation has a positive and statistically significant effect on the likelihood of working in agriculture whereas the direction of effect varies for non-farm employment depending on the type of measurement used (Table 5.7, panel A & B). With everything else in the logit equation, held constant, relatively socially deprived youth are more likely to stay in farm employment than less relatively socially deprived youth. Again further supporting the earlier claim that youth from deprived households are likely trapped in agriculture as migration decisions and livelihood diversification requires better networks (social capital) (also reflected by the negative effect of social deprivation on non-farm employment), financial capabilities and other material resources. The result also challenges the presumption that lack of access to productive resources and viable livelihood opportunities are the deriving factors behind youth disinterest in agriculture, given the exit rate is high among youth from middle-income group. Our results also suggest that addressing resource constraints alone is not adequate. Agriculture seems to be a less preferred livelihood strategy among young people from households with the resources and education such as among middle-income category compared to the extreme poor.

Our multinomial logit analyses give an interesting insight but striking difference between part-time (who are attending school while participating in farming), and full-time youth farmers and non-farm workers (Appendix Table A5.2). On average, full-time farmer youth have 3.06 years of schooling, tend to be male (78%), have average per capita income of about 2288 birr, relative income deprivation of about 1081 birr, possess per capita farm size of 0.51 ha, and birth order of 3.23 and tend to possess farming experiences. Except for gender and land size differences, there are no significant differences across the three categories

of youth (i.e. part-time, full-time and non-farm). However, all these variables affect part-time and full-time farmer youth in very different ways. For instance, youth schooling has a significant positive effect on the probability of working as a part-time farmer but has a negative effect on full-time farming and non-farm employment (Appendix table A5.2). Better-educated youth prefer to work outside agriculture or prefer to continue their education expecting better earnings in the future. The same is true with regard to the effect of household demographic compositions (specific number of youth members in the household, birth order, the age of youth and household head characteristics). Youth from female head households are more likely to engage in full-time farming and non-farm activities than in other livelihoods such as part-time farming. Youth members from more educated households are less likely to engage in full-time farming and non-farm activities, and more likely to engage in part-time farming while attending school. Interestingly again, the attributes of parents remain crucial in determining the occupational choices of youth, especially in choosing livelihoods outside farming. Similarly, father and mother attributes affect youth occupational choices differently. In addition, availability of public institutions has a significant effect on livelihood choices both for within and outside agriculture (see Appendix Table A5.2). The estimated results show that the choice of parental attributes (whether to choose household head related attributes or father and mother related attributes) improves the predictive power of some variables of interest, suggesting the exclusion of these variables may lead to endogeneity as a result of omitted variables and also obscure the effects of parents (Table 5.7, column 2). For instance, the effect of gender and mothers' education are significant when both father and mother attributes are used instead of using household head attributes in the specifications. Moreover, the results suggest the different role fathers and mothers have in shaping the occupational choices of youth, especially in choosing occupations outside agriculture. In addition, availability of credit and saving institutions, social capital, and public services has a significant effect on occupational choices both for within and outside agriculture (see Appendix Table A5.2).

Table 5.7: Multinomial logit models of the effects of relative deprivations on (actual) youth occupational choices: results from objective and subjective measures

Variables	Full-time farm employment			Full-time non-farm employment		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
<i>Panel A: Objective measures of RD</i>						
Relative Income deprivation	-8.562*** (1.000)	-19.51*** (2.471)	-8.651*** (1.017)	-0.232 (1.397)	9.821 (6.503)	-0.338 (1.426)
Relative income deprivation square	0.689** (0.292)	3.209*** (0.744)	0.666** (0.301)	-0.158 (0.391)	-3.107 (3.028)	-0.132 (0.392)
Log (per capita income)	-13.58*** (1.727)	-25.45*** (3.528)	-14.10*** (1.770)	-6.201*** (2.371)	7.778 (8.152)	-6.210** (2.423)
Log (income square)	0.686*** (0.0996)	1.294*** (0.198)	0.718*** (0.102)	0.394*** (0.134)	-0.311 (0.438)	0.395*** (0.137)
relative social deprivation	0.0515 (0.0492)	0.228** (0.0927)	0.0400 (0.0503)	-0.0655 (0.0902)	0.198 (0.199)	-0.0603 (0.0904)
Relative non-income deprivation	-0.00362 (0.118)	-0.164 (0.183)	0.00637 (0.119)	-0.156 (0.201)	-0.393 (0.468)	-0.151 (0.200)
Land size per own child	-0.148 (0.156)	-0.248 (0.211)	-0.104 (0.154)	-0.100 (0.263)	-0.680 (0.745)	-0.0699 (0.263)
Number of livestock owned (TLU)	0.0286** (0.0116)	0.0308* (0.0161)	0.0298** (0.0119)	-0.0263 (0.0254)	0.00871 (0.0467)	-0.0252 (0.0253)
Observations	1,209	546	1,209	1,209	546	1,209
<i>Panel B: Subjective measures of RD</i>						
Relative Income deprivation	0.192* (0.104)	0.145 (0.143)	0.204 (0.156)	0.120 (0.212)	-0.0477 (0.489)	129.3 (64,337)
Log (per capita income)	-0.0971 (0.0989)	-0.274* (0.149)	-0.161 (0.161)	-0.117 (0.192)	1.121** (0.555)	211.5 (64,932)
relative social deprivation	-0.0592 (0.0931)	-0.00772 (0.137)	0.0494 (0.140)	-0.102 (0.179)	0.596 (0.439)	-115.5 (35,901)
Land size per own child	0.0157 (0.164)	0.0341 (0.210)	-0.00982 (0.259)	0.0704 (0.308)	-0.197 (0.645)	-227.1 (56,913)
Number of livestock owned (TLU)	-0.000673 (0.00990)	0.00490 (0.0135)	0.0212 (0.0180)	-0.0148 (0.0245)	-0.0157 (0.0505)	12.84 (3,577)
Observations	1,162	529	602	1,162	529	602
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Father characteristics	No	Yes	No	No	Yes	No
Mother characteristics	No	Yes	No	No	Yes	No
Head characteristics	No	No	Yes	No	No	Yes
Woreda and year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.

Note: The reference occupation (base outcome) is part-time farming. I reported the logs ratio. Reference group used is similar age and occupation. To avoid complexity, I did not report the estimation results from the use of other reference groups. I note that the use of other reference groups does not alter the basic conclusions. The full controls for the individual, household, parents as well as other controls used in the model are reported in Table 5.6.

In summary, our benchmark estimation results, which uses realized occupation of youth, suggest that, after controlling for absolute income and other important factors, youth from relatively more deprived households (i.e. the poorest categories) and least deprived (i.e. the richest or better off categories) are more

likely to choose livelihood options within agriculture than youth from middle-class households. While the former (i.e. poor) categories are more likely locked in agriculture due to resource marginalization for diversification and increasing cost of migration limiting them to consider livelihood strategies outside agriculture; the latter youth categories (i.e. rich or better off) are staying within agriculture considering the sector as profitable business or attractive employment opportunity, especially in highly commercialized areas. In addition, results suggest that occupation choice strategies in rural areas are not mainly for absolute income or asset gains but also for relative motives. In addition to relative deprivation considerations, social networks (or social capital), education and livestock ownership strongly determine livelihood choices of the rural youth within and outside agriculture. For instance, households with resource constraints and limited social capital are less likely to diversify their livelihood strategy within and outside agriculture such as engagement in off-farm activities; this perpetuating further the problem of underemployment or unemployment. In addition, the choice of parental variables needs special attention in the analyses of occupational choices of rural youth. I now turn to the discussions of the role of relative deprivations in shaping future occupational choices (intended occupations) of the rural youth; an alternative approach to the analyses of occupational choices.

5.4.3. The impact of relative deprivations on decision to stay or leave

5.4.3.1. Econometric results from objective measures

Relative deprivations and likelihood of stay in agriculture

To explore in depth how and in what way relative deprivations influence intended occupational decisions of youth, I relate household's relative deprivation to the likelihood of staying in agriculture in 10, 20 and 30 years' time. Table 5.8 reports the estimation results from the use of objective measures of relative deprivations. To avoid complexity, I report here selected variables of interest of the various specifications described earlier across multiple reference groups. Unless it is explicitly stated, the interpretations of the other variables in our analyses to follow are based on the specifications that control for youth and household head characteristics.

The objective of relating RD and occupational choices along different time horizons (intended occupations) is to explore further how might relative deprivations affect intended occupational choices, i.e. decisions that are forward-looking or intentions that are not realized yet. Most migration analyses are modeled based on intentions. As I noted in chapter two intentions and realizations vary greatly, a common phenomenon in most rural areas where there are information asymmetry and credit constraints that could enhance the realization of plans. In the analyses of the correlation between intended occupational choices and relative deprivations, I do not necessarily claim causality since it is possible that our main explanatory variables of interest (i.e. relative deprivations) may still be confounded by youth and parents unobservable

characteristics that I could not fully capture with cross-section observations. The use of various measures of occupational choices also serves as a robustness check. Doing so also helps to understand the mechanisms through which incentives or interventions could be designed to enhance youth employment in agriculture. Accordingly, our discussions in the remaining sections will focus on correlations rather than causal inference. However, the novel use of multiple self-identified reference groups and the different methods of measuring relative deprivations and occupational choices (in addition to the benchmark analyses presented earlier based on panel data set) is an added robustness check to our findings and to argue further the importance of relative deprivations in shaping the occupational choices (or decisions) of rural youth.

I argued earlier that absolute per capita income could have either positive or negative effect on youth likelihood of staying in agriculture, depending on the presence of non-farm employment or business opportunities, current occupational status (student or full-time farmer) and other related factors. I also hypothesized that relative deprivation (of different dimensions) would have either a negative or positive effect on decisions to stay in agriculture depending on wealth and availability of opportunities. Our empirical findings from the objective data confirm these expectations; that is the likelihood of choosing agriculture employment as an occupational strategy is highly correlated with household's relative income deprivation, youth's relative non-income, social deprivation and with per capita absolute income (Table 5.8, panel A). As one can see from Table 5.8, the estimation results yield negative coefficients on both absolute per capita income and relative deprivation across all the reference groups used for those planning to stay in agriculture in 10 years' time. The results for long stayers' yields negative coefficients on relative deprivation and absolute income for all reference groups employed. Interestingly, the effect of relative income deprivation is stronger *visa-a-vis* age, *woreda* and *occupation* reference groups for all the specifications. After controlling for individual and household attributes as well as other variables and using *woreda* as a reference group, a one point increase of the relative income deprivation index will correspond to a 0.19 reduction in the probability of staying in agriculture in 10 years' time (significant at the 5% level). This is an indication that income inequality within districts would result in the significant outflow of youth than the one resulted from the feelings of relative deprivation living with better-off neighbors. The effect of relative social deprivation and non-monetary deprivation also suggest similar conclusions.

I relate also household's relative deprivation to the likelihood of staying in agriculture in the coming 20 and 30 years' (Table 5.8, Panel B, and C). For those planning to stay 20 years, the effect of relative income deprivation is significant *vis-a-vis* the composite reference group *similar occupation* and age. This is partly because of the fact that for long-term occupation decisions and economic comparisons are more important among the youth of similar age working in similar occupations than say geographic comparisons. A positive significant effect of per capita income squared (not reported here) using neighborhood and land size holding

reference groups supports this line of reasoning. This is also in line with estimation results obtained in benchmark models. This also indicates that large-scale agriculture, such as the ones in the study areas, could be a potential source of youth employment (for those from better off households) if production inputs such as land are available.

Table 5.8 also shows that the sign of the coefficients on per capita absolute income varies across the different reference groups for long stayers (with a positive sign when neighborhood (village) is used as a reference group). If the quadratic transformation of both absolute and relative income are included in the specifications to capture potential nonlinearities created by some economic constraints and subsistence concern (i.e. whether the exit is so high (probability of stay is so low) or low (the probability of stay is so high) among the two extremes of the income distribution), I find that the coefficient on per capita income squared remain consistently positive, and coefficient on the square of relative income deprivation remains negative. The findings are consistent in all the specifications and various settings. This means that the desire to exit agriculture become less likely among youth from households whose income is at the higher end of the woreda income spectrum; whereas the opposite is more likely for youth from household's whose income spectrum is at the very low end of the woreda income spectrum (if woreda is a reference group). The result is expected for the former, given the agricultural potential of the areas and the growing commercialization of agriculture in the study areas. This is also consistent with what has been discussed earlier.

The effect of relative income deprivation becomes stronger when the decision to stay is greater than 20 years. Therefore, relative income considerations are more likely to matter more than or at least as much as concerns for absolute income when it comes to long-term employment decisions. In addition, the positive coefficients on per capita income *visa-a-vis geographic reference* groups (village) for those planning to stay more than 20 years also suggest that, youth are more likely to stay in agriculture to improve their economic status as well as their household's relative standing, when it comes to neighbourhood economic comparisons and long-term decisions. Moreover, focus group discussions held among different groups of societies suggest that relative deprivation could be a source of motivation that induces hard work in order to catch up or improve one's relative standing - "keeping up with the Joneses."

I have shown earlier that, the inconsistencies reported in the literature as to the effect of parents (fathers versus mothers) attributes on the children's livelihood choice is partly because of the choice of variables a researcher often uses as a proxy. *Ceteris paribus*, a one-year increase in education of mothers' is associated with a 3.7% decrease in the probability of staying in agriculture in the next 10 years (significant at the 5% level). For each additional year of age of fathers', the likelihood of staying in agriculture in 10 years' time decreases by about 1.1% for youth of all type, holding all other variables at their means. As is the case in the benchmark, female youth are 17% less likely to choose farming as their livelihood as compared to their

male counterparts. This suggests that there is heterogeneity of preferences in making occupational choices among youth categories. It also implies that parents prefer youth's occupation outside agriculture, and this, in turn, increases the probability of youth migration. Another important point to note here is the effect of parental attributes on the likelihood of youth choosing farming. The further significant variable in this model specification is land. Keeping the influence of other factors constant, a 1-hectare increase in per capita farm size is associated with 18.8% increase in the probability of youth staying in agriculture, suggesting the importance of land for youth employment in agriculture.

I disaggregate further our empirical analyses between part-time farmer and full-time farmer and examine what explains the heterogeneity between the two groups of youth since they are heterogeneous with different aspirations and socioeconomic conditions determining their career paths. The findings suggest the heterogeneous effects of relative deprivations on part-time and full-time as well as for short stayers and long stayers. Therefore, designing interventions related to youth while treating household members as homogenous groups is misleading.

Overall, other factors explaining the probability of staying in agriculture in the 10 years' time (for short stayers) presented earlier remain significant for medium to long stayers as well (i.e. 20 and 30 years). However, the relative influence and importance of the variables differ between the two decision categories (short and long stayers) and between the two occupation categories. For instance, the relative influence of factors of production such as land and livestock is much greater for long stayers than short stayers. In addition, property rights such as land rights and farming experiences have a strong influence on the likelihood of youth choosing agriculture as a long-term occupation strategy. Moreover, agroecology or agricultural potential of districts (reflected via differences in districts) is an important factor that determines youth intended occupational choices both in short term and long term decisions.

Our estimation results indicate that absolute income is negatively and significantly related to the probability of staying in agriculture. After controlling for other variables and head characteristics, a 1% increase in income (mainly crop income) is associated with 5%-17% decrease in the probability of stay (Table 5.8, Panel A). One justification for this could be that as households get richer youth tend to consider livelihood options outside agriculture or diversify their occupations, especially at the early stage of their livelihood transformation, and less likely to engage in agriculture. To further investigate this, I included the quadratic transformation of income variable in the specifications. I find positive coefficient on income squared in the probability of stay, which complements the benchmark results (result not reported here). A subgroup analysis between part-time farmer and nonfarm workers for the two decision categories also result in similar conclusions. Furthermore, I note here that easing the constraints on access to land (the main constraining

factor of youth participation in agriculture) helps to attract more youth into agriculture (reflected by a positive correlation between per capita farm size and the probability of staying in agriculture). The OLS estimation also yields that a 1% increase in per capita farm size results in a 1.62%-2.40% increase in the probability of youth moving into agriculture (Table 5.10).

Table 5.8: Average marginal effects of (the different dimensions of) relative deprivation on the probability of staying in agriculture: results from objective measures of relative deprivation (probit estimates)

VARIABLES	Reference groups							
	AGE	EDUCATION	ETHNIC	VILLAGE	WOREDA	LAND	OCCUPATIO N	OCC_AG E
Panel A: Dependent variable: Remain active in agriculture in 10 years' time (S2) (1 if yes, 0 otherwise)								
Relative Income deprivation	-3.588** (1.813)	-0.143** (0.0684)	-0.163** (0.0729)	-0.125* (0.0658)	-0.188** (0.0756)	-0.154** (0.0749)	-0.173** (0.0688)	-0.117 (0.0912)
relative social deprivation	-0.523** (0.247)	-0.0258*** (0.00899)	-0.0271*** (0.00914)	-0.0275*** (0.00873)	-0.0250*** (0.00907)	-0.0276*** (0.00917)	-0.0262*** (0.00896)	- (0.0294*** (0.00900))
Relative non-income deprivation	-0.831* (0.500)	-0.0477** (0.0230)	-0.0455** (0.0230)	-0.0583*** (0.0215)	-0.0467** (0.0226)	-0.0434* (0.0230)	-0.0404* (0.0228)	-0.0473** (0.0232)
Land size per own child	0.813 (0.889)	0.0458 (0.0472)	0.0474 (0.0473)	0.0788 (0.0480)	0.0478 (0.0472)	0.0862* (0.0509)	0.0496 (0.0471)	0.0348 (0.0466)
Log (per capita income)	-2.097** (1.013)	-0.0888** (0.0396)	-0.0959** (0.0401)	-0.0700** (0.0344)	-0.105*** (0.0402)	-0.0792** (0.0360)	-0.100*** (0.0385)	-0.0419 (0.0284)
Panel B: Dependent variable: Remain active in agriculture in 20 years' time (S3) (1 if yes, 0 otherwise)								
Relative Income deprivation	-0.613 (0.551)	-0.0945 (0.0666)	-0.0530 (0.0674)	-0.00913 (0.0591)	-0.0475 (0.0664)	-0.0159 (0.0660)	-0.0793 (0.0641)	-0.143* (0.0799)
relative social deprivation	-0.0322 (0.0661)	-0.00196 (0.00816)	-0.00154 (0.00817)	-0.00149 (0.00793)	-0.000476 (0.00823)	-0.00171 (0.00828)	-0.00198 (0.00815)	-0.00337 (0.00822)
Relative non-income deprivation	-0.155 (0.175)	-0.0258 (0.0222)	-0.0238 (0.0224)	-0.0367* (0.0220)	-0.0161 (0.0226)	-0.0259 (0.0225)	-0.00886 (0.0213)	-0.0245 (0.0212)
Land size per own child	-0.475 (0.323)	-0.0582 (0.0396)	-0.0581 (0.0394)	-0.0467 (0.0403)	-0.0573 (0.0394)	-0.0527 (0.0429)	-0.0559 (0.0397)	-0.0611 (0.0396)
Log (per capita income)	-0.214 (0.293)	-0.0368 (0.0371)	-0.0158 (0.0369)	0.00843 (0.0310)	-0.0122 (0.0355)	0.00377 (0.0316)	-0.0272 (0.0344)	-0.0224 (0.0254)
Panel C: Dependent variable: Remain active in agriculture in 30 years' time (S4) (1 if yes, 0 otherwise)								
Relative Income deprivation	-0.958* (0.562)	-0.141** (0.0644)	-0.122* (0.0664)	-0.00692 (0.0580)	-0.128* (0.0661)	-0.0703 (0.0687)	-0.132** (0.0635)	-0.207*** (0.0765)
relative social deprivation	0.0369 (0.0678)	0.00526 (0.00792)	0.00631 (0.00788)	0.00678 (0.00762)	0.00707 (0.00799)	0.00624 (0.00802)	0.00609 (0.00789)	0.00403 (0.00794)
Relative non-income deprivation	0.0350 (0.178)	0.000887 (0.0213)	0.000732 (0.0215)	-0.00392 (0.0209)	0.0104 (0.0214)	-0.000444 (0.0216)	0.00697 (0.0207)	-0.00391 (0.0205)
Land size per own child	-0.344 (0.330)	-0.0409 (0.0386)	-0.0403 (0.0387)	-0.0331 (0.0393)	-0.0409 (0.0386)	-0.0236 (0.0422)	-0.0394 (0.0387)	-0.0452 (0.0389)
Log (per capita income)	-0.286 (0.293)	-0.0498 (0.0353)	-0.0405 (0.0363)	0.0176 (0.0295)	-0.0400 (0.0349)	-0.00927 (0.0312)	-0.0416 (0.0335)	-0.0292 (0.0245)
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Head characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# observations	560	560	560	552	560	560	560	560

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: All predictors at their mean values. 46.3 % of the part-timers and 76% of the full-timers are planning to stay in agriculture in the next 10 years' time. Whilst 20 % and 17 % of the currently part-time farmers are planning to stay in agriculture in 20 and 30 years' time, respectively. 59% and 46 % of the current full-time farmers are planning to stay in 20 and 30 years' time, respectively.

5.4.3.2. Econometric results from subjective measures

Relative deprivations and likelihood of stay in agriculture

To explore further, whether our estimation results are sensitive to the measurement of relative deprivations and occupational choices, I examine the effects of relative deprivation (measured subjectively) on youth's self-reported likelihood of staying in agriculture in 10, 20 and 30 years' time.³³ The estimation results from the subjective approaches for selected reference groups are reported in Table 5.9. Overall, the signs are consistent with the results obtained using objective measures and the magnitude of the estimates remain higher visa-a-vis similar age and similar occupation. However, in the use of subjective measures, relative income deprivation show significant associations with the probability of staying in agriculture in the 20 years' time for most of the reference groups (Table 5.9, Panel B). Put differently, subjective measurement of relative income deprivation has also negative and significant effect on the probability of staying in agriculture in 10, 20, 30 years' time. Both measurement approach to RD predict similar effect with respect to occupational choices but clearly shows that increase in youth's comparators (kebele or woreda level) increases stress for those planning to stay 10 years and strengthens their inclination to stay in agriculture. In addition, the effect of social relative deprivation is significant in most specifications in this setting.

Table 5. 9: Average marginal effects of relative deprivation on the probability of staying (remaining active) in agriculture: results from subjective measures (probit estimates)

VARIABLES	Reference groups						
	AGE	VILLAGE	KEBELE	WOREDA	OCCUPATION	LAND	EDUCATION
Panel A: Dependent variable: Remain active in agriculture in 10 years' time (S2) (1 if yes, 0 otherwise)							
Relative Income deprivation	-0.112 (0.116)	-0.182* (0.108)	0.0467 (0.106)	0.182* (0.0967)	-0.0348 (0.124)	-0.513*** (0.115)	-0.124 (0.0945)
relative social deprivation	-0.00434 (0.0967)	-0.117 (0.103)	-0.336*** (0.112)	-0.229** (0.105)	-0.279** (0.120)	-0.279 (0.1201)	-0.302 (0.112)
Log (per capita income)	0.104 (0.114)	0.0796 (0.116)	0.127 (0.115)	0.119 (0.114)	0.101 (0.114)	0.0684 (0.118)	0.107 (0.116)
Panel B: Dependent variable: Remain active in agriculture in 20 years' time (S3) (1 if yes, 0 otherwise)							
Relative Income deprivation	-0.443*** (0.137)	-0.328*** (0.127)	-0.358*** (0.123)	-0.239** (0.112)	-0.420*** (0.145)	-0.115 (0.135)	-0.015 (0.1041)
relative social deprivation	0.207* (0.113)	-0.161 (0.113)	-0.0964 (0.128)	-0.0619 (0.120)	-0.0572 (0.138)	-0.413*** (0.107)	-0.155 (0.1263)
Log (per capita income)	0.0525 (0.127)	0.0346 (0.129)	0.0658 (0.127)	0.0641 (0.126)	0.0563 (0.127)	0.0554 (0.127)	0.0548 (0.126)

³³ In general, I explore whether the estimation results are robust to the different measurement approaches to RD (i.e. subjective and objective measures) as well as to the various indicators of occupational choices (i.e. realized and intended occupations measures).

	Reference groups						
	AGE	VILLAGE	KEBELE	WOREDA	OCCUPATION	LAND	EDUCATION
Panel C: Dependent variable: Remain active in agriculture in 30 years' time (S4) (1 if yes, 0 otherwise)							
Relative Income deprivation	-0.314**	-0.218*	-0.260**	-0.179	-0.371**	0.0197	0.0357
	(0.137)	(0.129)	(0.123)	(0.112)	(0.146)	(0.135)	(0.105)
relative social deprivation	0.185	-0.230**	-0.161	-0.0217	0.0652	-0.299***	-0.209
	(0.113)	(0.113)	(0.128)	(0.119)	(0.138)	(0.0995)	(0.127)
Log (per capita income)	0.0871	0.0821	0.0987	0.0952	0.0967	0.0959	0.110
	(0.132)	(0.134)	(0.131)	(0.132)	(0.132)	(0.133)	(0.131)
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father/mother characteristics	No	No	No	No	No	No	No
Head characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Woreda and other dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	638	638	638	638	638	638	638

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: Gender-based analyses show that income RD using subjective measures is negative for male and vary for female.

5.4.4. Relative deprivations and occupational mobility decisions

Another alternative proxy used to measure intended occupational choices of youth is self-reported probabilities of moving into and out of agriculture. Put differently, I analyze further the association between relative deprivations and the likelihood of moving either into or out of agriculture. Table 5.10 present the OLS estimation results of the different model specifications (Eq. (5.6 and 5.8)) presented earlier for occupational choice sets: S5, M1, M2 reported in Table 5.6.

I confirm again the stronger effect of relative deprivation on the probability of moving out than on moving into agriculture with respect to geographic and economic reference group. Whilst the impact of relative income deprivation is stronger and significant for moving into than for moving out *visa-a-vis* economic reference groups, mainly with respect to land size; the influence of relative income deprivation is stronger and significant for moving out of than moving into *visa-a-vis* socio-demographic reference groups (age, education) (Table 5.10, Panel A). The incentive to move out of agriculture decreases among youth from rich households and among the least deprived households. In other words, relatively highly deprived youth have a lower probability of exit (trapped in agriculture) and the relatively least deprived youth have also a lower probability of exit; a result consistent with the benchmark presented earlier. In some cases, youth from the most relatively deprived households cannot make proper choices since moving out of agriculture such as migration and investment in non-farm sector require financial capabilities and better connections (or social capital). The negative and significant coefficient on both relative income deprivation and the squared relative income deprivation suggest the former while the negative coefficient of social RD with respect to occupation and age reference groups suggest the later. The poor lack such capital forcing them locked in agriculture. Furthermore, absolute income is negatively associated with the probability of moving

into and is positively correlated with the probability of moving out of agriculture (agricultural labor exit or migration intention) confirming again more preferences toward non-farm employment or preferences for diversification, as income of the household improves or increases. Another interesting point to note from the results presented in Table 5.10 is that both measures (objective and subjective measure) of the income relative deprivation overall result in similar conclusions; whereas social relative deprivation affects predictions of migration into and out of agriculture outcomes differently (based on kind of measurement employed). For instance, when the comparison is between occupations, relative income deprivation induces within labor supply (increases the probability of stay) and decreases the probability of changing occupation (i.e. propensity to migrate) (irrespective of the measurement of relative deprivation). However, the probability of moving into agriculture is positively correlated with social relative deprivation measured using objective approaches and negatively correlated measured using subjective measures, but significant only for the later. In all the cases, decisions to change occupation or to work elsewhere is affected more by relative deprivation than absolute motive.

Table 5.10: The effects of the different dimensions of relative deprivation on the probability of moving into and out of agriculture: OLS estimates using objective and subjective measures

Variables	Dep: probability of transiting from part-time or non-farm to full-time (S5): agricultural labor entry					Dep: probability of transiting into non-farm employment (M1-M2): agricultural labor exits			
						Reference groups			
	AGE	VILLAGE	KEBELE	WOREDA	LAND	AGE	EDUCATION	OCCUPATION	OCCUP_AGE
<i>Panel A: Objective RD</i>									
Relative Income deprivation	-0.0552*** (0.0147)	0.000364 (0.0115)	-0.00660 (0.0121)	-0.0165 (0.0121)	-0.0328* (0.0172)	-0.0645* (0.0388)	-0.0690* (0.0382)	-0.0534 (0.0397)	0.103* (0.0560)
Relative social deprivation	0.00127 (0.00495)	0.000580 (0.00495)	0.00232 (0.00501)	0.00202 (0.00502)	0.00132 (0.00512)	-0.00114 (0.00531)	-0.000725 (0.00530)	-0.000376 (0.00532)	-0.0137** (0.00590)
Relative non-income deprivation	-0.0120 (0.0116)	-0.0119 (0.0115)	-0.0184 (0.0118)	-0.00517 (0.0115)	-0.00720 (0.0117)	0.00493 (0.0137)	-0.00423 (0.0136)	-0.00629 (0.0136)	0.0303** (0.0150)
Observations	617	554	577	606	617	509	509	509	501
R-squared	0.316	0.323	0.330	0.305	0.322	0.333	0.334	0.332	0.548
<i>Panel B: Subjective RD</i>									
Relative Income deprivation	0.0133 (0.0119)	0.0112 (0.0113)	0.00678 (0.0104)	0.00512 (0.00934)	-0.0268*** (0.0103)	-0.120* (0.0720)	0.0995 (0.104)	-0.149 (0.109)	-
Relative social deprivation	-0.0251** (0.00998)	0.0119 (0.0104)	0.00148 (0.0109)	-0.0188* (0.0102)	-0.0208** (0.00920)	0.0335 (0.101)	-	-0.0266 (0.115)	-
Observations	621	621	621	621	621	621	621	621	-
R-squared	0.313	0.315	0.313	0.316	0.313	0.313	0.313	0.313	-
Individual characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Father/mother characteristics	No	No	No	No	No	No	No	No	No
Head characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Woreda dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.

Note: Other controls such as material assets determine youth agricultural labor entry. The association between objective relative income deprivation and agricultural labor exit turns significant when log of PCI is used in the computation of relative deprivation with respect to occupation. It is also economically meaningful since per capita matters more than total income for individuals' decisions such as migration decisions. VIF: to full=3.13, to non=-2.72, error term normally distributed and no heteroscedasticity.

As to other controls significantly influencing youth decision options, a striking difference is observed on the two occupation strategies (options) (i.e. between movers into and movers out of agriculture) and also for the two subgroups (part-time workers and full-time workers). The OLS models suggest that, in addition

to RD, youth's probability of changing current occupation from part-time farming or non-farm work to full-time farming, and the probability of changing the current part-time farming or full-time farming to full-time non-farm work are determined by demographic and socioeconomic factors. These include gender of youth and parents, the age of youth and father, education of youth and mother, birth order, farming experience, marital status of fathers and a number of female youth members in the household (Table A5.4). Except for birth order, each of these variables affects the two occupation options (categories) in very different ways. Compared to their male counterparts, female youth are 8% less likely to move into and 6% more likely to move out of agriculture. This has a clear gender dimension. Given the nature of farming in rural Ethiopia such as managing, the family farm is generally and (culturally) the responsibility of men. Farming experience (especially co-management of farmlands with parents) remains another important factor determining agricultural labor entry. Youth who have farming experiences are 10.7% more likely engage in agriculture than in other sectors compared to those who have no such experiences and 4.9% less likely to move out of agriculture. This clearly reflects the fact that there is no or weak complementarity between the experiences gained in agriculture and non-farm employment. In other words, the experiences one gain from farming cannot serve in non-farm employment for better earnings. Availability of public services has a different impact on youth's probability of moving into and moving out of agriculture. In addition, public services such as public marketplaces and availability of veterinary services remain a key determinant of agricultural labor entry and exit.

In sum, overall results suggest that increase of RD decrease labor participation in agriculture and increases inclination to resort to migration; irrespective of the measurement of relative deprivation and occupational choices. Interestingly, both measures of relative deprivations virtually result in similar conclusions with respect to occupational analysis, i.e. relative deprivation increases agricultural labor exits and decreases agricultural labor entry. The exit rate is higher among youth from middle-income group compared to the poorest category. In addition to economic disparities relative to peers, the recent expansion of education in rural areas has contributed to the decrease of youth labor force in agriculture. For instance, World Bank (2012) shows that Ethiopia saw her secondary school enrolment more than double between 2000 and 2012. However, I find also that agricultural occupation is also a potential source of employment (or wealth creation) for rich income groups (better off groups). Contrary to the assumptions that all types of youth disinterest in agriculture can be attributed to the absolute motives, our findings suggest that (at least in the context of agricultural potential areas) relative motives matter most or at least as equally as absolute motives in the occupational choices of rural youth. Put differently, I provide evidence that (various forms of) relative deprivation effect(s) occupational choices of rural young people and their engagement in agriculture. As a result development policies that aim at raising only absolute income through redistribution such as support for resource-poor youth or households may not result in best outcomes (and even may worsen youth

outmigration, i.e. more migration of youth that can hamper agricultural labor quality). The results are robust to different specifications. Table 5.11 provides a summary of the main findings.

Table 5.11: The impact of relative deprivations on occupational choices: summary results

Realized occupation (multinomial logit)					
	Full-time farming			Non-farm employment	
Income RD	-ve (sign)			+ve (insig)	
Income RD square	+ve(sign)			-ve(sign)	
Non-income RD	-ve(sign)			-ve(insign)	
Social RD	+ve (sign)			+ve (insign)	
Income square	+ve(sign)			+ve(sign)	
Base outcome variable is part-time farming					
Intended occupational choices					
	Stay (probit):			Move (OLS):	
	10 years (S2)	20 years (S3)	30 years (S4)	into (S5)	out of
<i>Objective measure of RD</i>					
Income RD	-ve (sign)	-ve(sign)	-ve (sign)	-ve(sign)	+ve(sign)
Non-income RD	-ve(sign)	-ve(sign)	-ve(insign)	+ve(insign)	+ve(sign)
Social RD	-ve(sign)	-ve(insign)	-ve(insign)	-ve(insign)	-ve(sign)
<i>Subjective measure of RD</i>					
Income RD	-ve (sign)	-ve(sign)	-ve (sign)	-ve(sign)	-ve(sign)
Non-income RD	-ve(sign)	-ve(insign)	-ve(insign)	-	-ve(sign)
Social RD	-ve(sign)	-ve (sign)	-ve(sign)	-ve(sign)	--ve(insign)

Note: (Dependent variables for intended occupations: remain active in agriculture in 10, 20 and 30 years' time (S2, S3, S4) (1 if yes, 0 otherwise); the probability of moving into and out of agriculture takes the values between 0 and 1). Sign denotes that the estimate is statistically significant. -, +ve, +ve and sign denote negative coefficient, positive coefficient and significant, respectively.

5.5. Conclusions and policy implications

The literature on the effect of relative concerns (measured in terms of household relative deprivations or positional concerns) on occupational choices of rural youth in developing countries is scant. Motivated by that, this study tries to examine the impact of relative deprivation on occupational choices of rural youth in Ethiopia. Specifically, the study tries to investigate two important issues: to what extent do (household's) relative deprivation of different dimensions determine occupational choices (within and outside agriculture), and whether and how these shapes youth's labor participation decisions within and outside agriculture. Using econometric techniques that use panel data from Ethiopia and employing an objective and subjective measure of relative deprivation, I provide evidence that relative deprivations affect occupational choices of young people: agricultural labor participation decisions and migration decisions. I show also that our results are overall consistent across various definitions of reference groups, measurement of relative deprivations and occupational choices. I summarize results from each specification as follows.

Estimation results from multinomial logistic regression with random effects (based on realized occupations) suggest that both income and social relative deprivation have a significant effect on occupational choices

(i.e. on youth's agricultural labor participation decisions). However, the magnitude and significance of the estimates depend on the type of measurement of relative deprivation employed and to some extent on the choice of parental controls. Youth from relatively more deprived and least deprived households are more likely to choose occupations within agriculture than youth from middle-income households. In other words, youth from the middle class are more likely to choose livelihood options outside agriculture than youth from the poorest and richest households. This suggests that, whereas the very poor are locked in agriculture (trapped in or locked into agriculture and low pay jobs), the rich stay because the incentive to move out of agriculture is low and agriculture is an investment opportunity with high return. The result is expected for the later, given the agricultural potential of the areas and the growing commercialization of agriculture in the study areas. The very poor locked in agriculture since they lack the necessary resources and better connections (or social capitals) which enable them to diversify their income sources and/or to migrate elsewhere in search of better opportunities, thus decreasing their social mobility. This suggests that the exit rate is higher among the middle-income group. In the long-run, this may lead labor force to higher rates of long-term unemployment and increased inequality. As a result, agricultural will be dominated by low skilled forces since youth from the middle class with relatively better skills and resources are more likely to choose livelihoods outside agriculture than youth from the poorest households; further leading to a high risk of rural labor drain and inequality.

The empirical estimation from probit models that uses intended occupational choice (as an alternative measurement to occupational choices) analyses also show that relative income deprivation is strong predictor of youth's intended likelihood of stay in agriculture (in the coming 10, 20 and 30 years); the results are robust across the various reference groups and measure of relative deprivation. Moreover, OLS estimation results (using the probability of changing current occupation from either part-time or non-farm to full-time farming; and vice versa) also suggests that relative deprivations (irrespective of the measurement employed) affect youth's labor supply decisions in agriculture and non-agriculture. I find that the probability of transiting into non-farm (i.e. moving out of agriculture) is so low (negative and highly significant some up to 10%) among the youth from the most relatively deprived households but the probability of stay is positive among the least deprived households. This is a common phenomenon when I use geographic area reference groups and economic reference groups such as land, and occupation. Youth from the most relatively deprived households cannot make a proper choice since moving out of agriculture such as migration requires financial capability and better connections, which the poor lacks. Furthermore, absolute income is negatively associated with agricultural labor entry and is positively correlated with the likelihood of move out of (agricultural labor exit) suggesting youth's more preferences toward non-farm as income of the household improves until agriculture appears commercial or attractive. It suggests also an increasing interest to diversify livelihood strategies as income levels increases. Social deprivation has

consistently negative and significant effect on the likelihood of choosing occupations within agriculture whereas its effect on choosing non-farm employment depends on the type of relative deprivation measurement employed. Estimation results also indicate that relative deprivation affects both agricultural labor entry and exits in a way that exacerbates unemployment, underemployment, and the vicious circle of poverty.

As a result, the use of multiple reference groups and the different dimensions of relative deprivation add interesting insights in the analyses of occupational choices of the rural youth. For instance, economic comparisons are important than other social comparisons for occupational choices. In addition, the significant effect of relative deprivation vis-à-vis geographic reference groups suggests that a certain development policy solely motivated to raise absolute income level based on wealth differentials to stem rural-to-urban migration may not be optimal and misleading; if relative concerns are important and crucial in the youth's occupational decisions. The use of multiple reference groups also helps to identify where problems associated with inequality are prevalent and persistent. For instance, it helps to inform which level of stratification best reveals problems associated with inequality (or RD): among unequal peers, societies, villagers, races, ethnicity, etc. Thus, the choice of multiple reference groups and robust measurement approaches to RD and occupational choices are important, especially when it comes to the analyses of long-term occupational decisions. Moreover, the effects of the different dimensions of relative deprivation on occupational choices indicate that limiting relative deprivation analyses to income spheres may fail to capture the multifaceted effect of relative deprivations. Thus, disaggregating the effects of relative deprivations on occupational choices is important and doing so provide useful information to identify and design interventions aimed to tackle inequalities and rural under development.

Our findings suggest that development policy that aims at redistribution such as support for resource-poor youth may not improve participation of the youth in agriculture. It could even worsen youth outmigration if rural employment opportunities are limited. As a result, agriculture may become the workplace of the left behind, especially male youth, since youth from better-off households may prefer to invest in education and non-farm activities. This, in turn, also affects agricultural productivity. If the poorest are locked in agriculture and the relatively better off (well-off are leaving agriculture), it might worsen the poverty situation in the country. As the better off leaves, agriculture will be dominated by the poor who lack the necessary resources to infuse agriculture with innovation, less educated, and low human capital, worsening the performance of agriculture and productivity. Unless appropriate policy that could address this problem is wisely designed and implemented, it is worrisome in the long run.

Raising the incomes of highly deprived youth may reduce the youth's incentive to leave agriculture but, should be coupled with improving access to farm inputs, credit and saving institutions that could unleash

such constraints. Governments need to invest in youth-targeted employment-generating schemes and entrepreneurial training, improving the forward and backward linkages between agriculture and non-agriculture. Economic as well as social development that does not redress income or other resource inequalities may result in the most deprived youth to fall into extreme poverty that in turn affects the development and productivity of agriculture. To increase youth employment in agriculture and reduce youth unemployment and underemployment as well as infuse rural development, it is necessary also to improve the resource base of the marginalized youth, specifically for those youth who are trapped into structural poverty. Thus, explicit consideration of the relatively highly deprived households and improvement in land and labor markets could help to convert deprivation into opportunities and ameliorate the situations of the left-behind. Putting micro-financial institutions in place to ease liquidity and input supply constraints are vital. Such kind of institutions has to facilitate and encourage youth as well as parents to make use of resources for productive investments.

The findings have important implications for marriage market as well. Agriculture in the long-run may become a workplace of left behind young men since female youth are more likely to choose livelihood options outside agriculture. Thus, policies need to readdress consequences of such inequality and deprivation. There is also a need to invest on the human capital of youth and institutions including agribusiness to make use of demographic dividend. It is also necessary to reduce vulnerability and promote productive youth employment such as off-farm, support systems, and interventions needed to build skills and prepare young people working in agriculture to successfully enter or access markets. Thus, investment in agribusiness is necessary to infuse agriculture with entrepreneurs. The transformation of manufacturing and the growing role of public rural investment are necessary to provide economic opportunities for the rural youth. Otherwise, young labor will be drained from the rural sector, with the risk of rural societies falling into decay. Finally, treating household members as homogenous groups in the design of interventions related to youth could be misleading and/or ineffective. Thus, explicit consideration of youth based on gender is necessary for designing interventions aimed to improve the well-being of rural youth. This requires better coordination within households, communication, and cooperation between different government departments, civil society, NGOs and the private sector.

6. SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

Efforts to improve youth employment in agriculture and tackling youth unemployment and underemployment problems require understanding a number of issues: how decisions are set, how young people behave in comparison to their peers, how parents' behaviors and attributes affect children's decisions and well-being. This necessitates the need for appropriate theoretical and empirical construct that helps to understand how relative concerns and related factors influence youth's decisions to engage in agriculture, with consequences on the well-being of young people. This research is designed to contribute to filling these gaps and add insights to the existing knowledge in order to revitalize the agriculture sector and speed up the process of transformation of the agricultural sector through youth's provision of labor in agriculture and agribusiness. Generating information in this regard help to contribute to the policy debate related to youth as well as to design appropriate policy instruments which lead to promising livelihood pathways of youth (as resource owners and farm workers) confronted with choices. This starts with the need to learn from and understand how youth make occupational choices and understanding the dynamics and drivers related to it. In this thesis, I propose the use of relative deprivation theory to better understand occupational choices (agricultural engagement and disengagement decisions) of rural youth in agriculture, with consequences on well-being. The thesis also uses this theory to explore how and to what extent intra-household (youth, fathers and mothers) concerns for positionalities are linked to the well-being of the offspring, with implications on household's resource allocations. The thesis begins by examining the effects of gender and age-specific values of agricultural labor returns (shadow wages or economic incentives) on youth labor supply in agriculture in Ethiopia. In doing so, I use econometric techniques and survey experimental methods matched with socio-demographic panel data. The survey experimental approach is based on a tailor-made experimental design conducted among Ethiopian youths and their fathers and mothers in rural areas. In addition, the study uses different triangulating measures of RD and examines how such measures affect the outcome variables of interest: well-being, occupational choices, and agricultural engagement decisions.

The main goal of the thesis is to empirically investigate whether beyond material constraints; behavioral or psychological factors such as the feelings of relative deprivation affect and/or shape the well-being and occupational choices of young people. I empirically explore that young person compare their life condition (income, wealth, social capital) to that of others (their comparison groups) and such comparisons are driving their economic decisions such as labor participation decisions, migration decisions, with consequences on well-being. I also show that youth's and parents' (namely fathers' and mothers') engagement in interpersonal wealth comparisons have implications for household's resource allocations and poverty measures (or reduction).

The dichotomy often exists in the literature of agricultural household members' allocation of their labor, is its inadequacy to distinguish whether market and non-market labor are spent on-farm or off-farm and for which household member and age category is the phenomenon refers. Second and most importantly, understanding youth career choices requires exploring how youth labor is allocated within or among households that involves both market and non-market economy; and whether marginal productivities determine youth labor supply in agriculture. Using shadow wages estimation techniques applied to farm level panel data collected from a sample of youth and households in rural Ethiopia collected during the 2010/11 and 2014/15 agricultural seasons, chapter 2 first econometrically investigate the effect of marginal products of labor (or shadow wages) on youth agricultural labor supply across gender, time and farm locations. Evidence from fixed effects and fixed effects instrumental variables (FE-IV) methods show that changes in economic incentives such as shadow wages matter for youth's involvement in agriculture, but their impact differs for young men and women. In other words, trends and patterns of the youth's involvement in agriculture vary across gender and farm work locations, and so do their labor returns. Whilst the participation of youth in on-farm for both young men and women is declining across time (though insignificant), the participation in off-farm is increasing for both. The total agricultural labor supply (sum of on-farm and off-farm) of both male and female youth is decreasing but none of them is significant. For instance, after controlling for unobserved heterogeneity (FE estimates), I find positive and significant shadow wage elasticities (0.40, 0.11 and 0.40 for on-farm, off-farm and total labor supply of male youth members, respectively). I also find that the effect of shadow wage is higher in an on-farm labor supply compared to off-farm (0.40 vs 0.11). The effect of female shadow wages on youth female members labor supply is negative and strongly significant at 1% level, suggesting that female youth agricultural labor supply is backward bending. The results are consistent after controlling for individual heterogeneity, sample selection and instrumenting for possible endogeneity. The shadow wage elasticities are especially higher when instrumenting for shadow wages, a higher result than what is reported in some other studies such as Calves and Schoumaker (2004). In addition, inline with Omoti (2012), I also find that youth's intentions and realized engagement in agricultural production vary greatly.

Taking into account intensity of youth involvement on the family farm or own farm, off-farm as well as their farm work at the destination for youth migrating to other rural and peri-urban areas, the results challenge the presumption that youth are exiting agriculture, at least in agricultural potential areas of Ethiopia. Instead, youth's labor makes an important economic contribution to the operation of their family, own farm as well as to other farms or the economy. Based on descriptive and econometric results, I conclude that the myths of youth departing agriculture over the last decade does not necessarily emanate from the trend and evolution of participation in agriculture but possibly from the methodological drawbacks. For

instance, Bezu and Holden (2014), Ahaibw et al. (2013) and Agwu et al. (2014) use intentions and separability methods in the analyses of labor supply, and conclude that youth are abandoning agriculture. However, our study underscores the previous finding that realized and intended engagements of youth in agriculture vary greatly. Studies using such data for the labor market and/or migration policy analyses should be cautious of such variations. Furthermore, contrary to Benjamin and Kimhi (2006), Ahearn et al. (2006), and Dupraz and Latruffe (2015) who use the aggregated measures, our results suggest that aggregating heterogeneous labor productivities in the computation of shadow wages are likely to mislead policy conclusions. The findings suggest that it is necessary to enhance labor productivity and employment opportunities, as well as a structural transformation that addresses the imperfections and rigidities in labor and other input markets, to make agriculture more attractive to youth.

Relative income concerns (or positional income concerns) is one mechanism through which income or wealth inequality is hypothesized to affect human behavior, with consequences on well-being. For instance, strong positional concerns (an increase in relative concerns or want of social status) among parents may lead to diversion or allocation of more resources to members in order to improve the relative standing of their offspring, which in turn fosters life satisfaction. Employing survey experimental methods conducted in 2010/11 and 2014/15 among Ethiopian youth and their parents matched with a socio-demographic survey, chapter 3 finds that positional concerns are heterogeneous among household members: youth members, fathers, and mothers. Youth exhibit higher positional concerns for income than their parents (fathers and mothers) do, and young women than men do. Our findings are contrary to the previous work of Akay et al (2012) who find very low positional concerns among adult rural farmers in Northern Ethiopia. This could perhaps reflect the fact that youth are more oriented towards the performance of their peers compared to their parents. Of parents' positional concerns, mothers' exhibited a higher positional concern for income than fathers'. Evidence from interval regression models suggests that factors that motivate the positional concerns of the three categories of household members also differ. Estimation results from the ordered probit model further show that youths' own and their fathers' positional concerns are strongly and significantly associated with the well-being of youth. Though mothers' are more positional than fathers' are, their positional concerns for income has a statistically insignificant effect on the welfare of youth. However, mothers' attributes such as education are more likely to influence the well-being of youth members than their concerns for positionality. Rather than through the effect of status concerns, mothers' affect the wellbeing of household members through their human capital (such as education). The strong significant effect of fathers' positional concerns on well-being compared to mothers' may have to do with differences in intra-household bargaining power affecting resource allocations. This is reflected by the fact that youth from positional fathers are associated with higher well-being compared to those with less

positional fathers. There could be several factors at play. First, parents who are more positional may invest more on their offspring in order to improve the relative standing of their children compared to less positional parents. Second, the altruistic behavior of parents towards their children and centralized motives between youth and parents may also cause this; this is likely in rural areas where there is strong social capital that complements (or eases) the stress resulting from relative concerns. Furthermore, I find that controlling for parents' attributes in the specifications do substantially improves the explanatory power of the models as well as the magnitude of the estimates of some variables. The findings underscore the implications of heterogeneity of parents' preferences suggesting that interventions targeting youth should also consider intra-household heterogeneity and within household resource distributional issues. The study also finds that having separate income sources has strong and significant effects on positional concerns and well-being of rural youth. The majority of youth in rural areas are unpaid family laborers who work on their family's farms living with their parents. Youth contribute a significant share of family labor or income (as indicated in chapter 2). However, they do not get their fair share and by far less happy in their life satisfaction. This may, in turn, limit youth entrepreneurship or agency, which again affects the welfare and future occupational choices of youth. It is worth mentioning that, to the best of the author's knowledge, this is the first empirical test of the effect of intra-household positional concerns on the well-being of youth household members, with implications on the household's resource allocations. In addition, this is among the few empirical studies that explicitly focus on both the simultaneous role of fathers and mothers in the analyses of youth well-being.

Recent empirical studies provide evidence that people take actions out of a concern for relative deprivation (Stark and Taylor, 1991; Easterlin, 1995; Johansson-Stenman et al. 2002; Alpizar et al, 2005; Ferreri-i-Carbonell, 2005; Park, 2010; Stark and Hyll, 2011). Theoretical studies also illustrate that more can be explained if I move beyond the standard choice theory and recognize relative concerns (Easterlin, 1995, 2001; Clark and Oswald, 1996; Alpizar et al., 2005; Stark, 2016). The present study checks these effects against multiple self-identified reference groups, enabling us to examine a broader range of questions related to youth well-being than in previous studies in developing countries. In doing so, chapter 4 extends the standard analyses of relative concerns (or relative deprivation) to income *per se*, and consider social relative deprivation as well as non-monetary (assets) relative deprivation. Since the effects of relative deprivation on well-being are also sensitive to the kind of measurements employed, the thesis employs two measurements of relative deprivation: objective and subjective, and compares the results from both, the first empirical test to the best of the author's knowledge. Evidence from random-effects ordered logistic regression and fixed effects models suggest that while income RD has a motivational impact (resulting from "positive externality" or "signal effect"), assets and social capital RD has a deterrent impact (resulting from status effect) on the well-being of youth. A "signal effect" or a "positive externality"- higher income of

others in the reference group indicate higher prospects for youth or induce motivation or aspirations (i.e. relative deprivation induced aspirations). In contrast to limited work in developing countries such as Carlsson et al (2007b), Ravallion and Lokshin (2010), and Akay and Martinsson (2011) which find that relative income does not significantly affect the well-being of the poor, our empirical results do suggest that income disparities relative to peers are a welfare relevant concern for most rural youth in Ethiopia. If I employ objective measures of RD, our findings are also in contrast to past empirical works in developed countries such as Pingle and Mitchell (2002), Carlsson et al (2007) and Friehe et al (2014) which find strong negative impact of relative deprivation on well-being, or Oshio et al. (2011) who find the Yitzhaki measure of relative deprivation negatively correlated with happiness for China and South Korea.

Unlike the previous studies on adults in developing countries such as Akay et al (2014), Luttmer (2004), and Ferrer-i-Carbonell (2005), the signs and significance of RD also varies with gender, age, and youth category: the strongest effect of RD on SWB for members or younger youth who live with their parents, and for young women than men. In addition, the comparison of the two measurement approaches, suggest that the sign and magnitude of the impact of monetary RD on SWB depend on the kind of the measurements employed, the choice of parental controls and to a lesser extent on the choice of reference groups. For instance, when land size is used as a reference group, the effect of income RD is strongly significant for youth who live with their parents and for young women suggesting that land inequalities are more serious among female youth members [that could have implications for female youth participation in agriculture]. When young men compare themselves with those having a larger number of livestock, the negative effect of social RD is stronger and significant while this is the not the case for younger women. On the other hand, when young women compare themselves with those having a larger portion of land, the negative effect of social RD on their SWB is stronger and significant; while this is the not the case for young men. The results also indicate that decomposing the contribution of RD in dimensions would help to avoid the averaging of positive and negative income and non-income, and SWB relations; reducing the problem of aggregation. The findings further indicate that while the effect of absolute income on SWB of young men is consistent across the two measurement approaches employed, it varies for young women.

One of the channels through which relative deprivations affect human behavior is through its effect on human decisions such as occupational choices. Incorporating relative deprivations into youth occupational choices help to provide a complementary explanation, if not an alternative explanation, to better understand

occupational choices of rural youth in Ethiopia as well as to the considerable intra-household preference differences existent in the labor markets of developing countries. The main goal of the thesis is ultimate to understand the implications of relative deprivations by examining their interactions not only with the underlying drivers of occupational choices of young people but also their interactions with the occupational choices or decisions themselves. Using various estimation techniques, chapter 5 finds that relative deprivation is a strong predictor of occupational choices of the rural youth and their engagement in agriculture (irrespective of the relative deprivation and occupational choice measurements employed) with an influence of the preferences and attributes of the parents. Youth from relatively more deprived households (poor income groups) and least deprived households (rich income groups) are more likely to choose livelihood options within agriculture than youth from middle-income households. Whereas the very poor appear locked in (informal) agriculture, the rich stay or participate in agriculture because of the potential returns from it. It also suggests that relative deprivation would force youth from middle-income households to consider livelihood options outside of agriculture and non-farm work such as investment in human capital or migration. This raises the latent demand for education since youth attending school are optimistic about earning better through education. For instance, a one-unit increase of relative income deprivation index will increase the likelihood of schooling (part-time farming) by about 2% and decreases the likelihood of choosing full-time farming in 10 years' time by about 0.91%. If the exit rate is high among the middle-income group with relatively better skills, resources, and aspirations; agriculture may be the workplace of the left behind, further hampering the future of agriculture and food security of the country.

The thesis adds some insights for understanding the causes of rural under development. In addition, the study finds that the decision of youngsters or teenagers to engage in agriculture not only depends on youth's own choices or employment preferences driven by their capabilities and behavior but also depends on the preferences and attributes of parents. I show earlier that, the inconsistencies reported in literature as to the effect of parents' (fathers' versus mothers') attributes on the choices of children's livelihood partly emanate from the specifications used in the regression models (i.e. the choice of variables a researcher often uses as a proxy to control for parental effects). For instance, educations of fathers' and mothers' have opposite effects on the probability of youth staying in agriculture. *Ceteris paribus*, a one-year increase in education of mothers' is associated with a 3.7% decrease in the probability of staying in agriculture in the next 10 years (significant at the 5% level), holding all other variables at their means. I find also that the effect of relative income deprivation becomes stronger when the decision to stay is greater than 20 years. Therefore, relative income considerations are more likely to matter more than or at least as much as concerns for absolute income when it comes to long-term employment decisions. This study is the first empirical attempt to tests the theory of RD in the context of occupational choices in one of the world's poorest countries, Ethiopia.

In general, the different dimensions of relative deprivation, the use of multiple reference groups, and robust measurement approaches to RD add interesting insights in the analyses of well-being and occupational choices of the rural youth, for understanding the causes of rural under-development. First, it suggests that economic comparisons are important than other social comparisons for occupational choices of rural youth. Second, the significant effect of relative deprivation vis-à-vis geographic reference groups, in the context of occupational choices, suggests that a certain development policy solely motivated to raise absolute income level based on wealth differentials to stem rural-to-urban migration may not be optimal and misleading. Third, the use of multiple reference groups and robust measurement approaches to RD help to identify and inform which level of stratification and inequality best reveal problems associated with RD: among unequal peers, societies, villagers, races, ethnicity, etc. In addition, the use of multiple reference groups and measurements highlights possible areas of interventions to enhance the positive externalities arising from relative deprivations (RD induced aspirations). The use of multiple reference groups also helps to identify the best domains (channels) through which the positive externalities from economic gains to rich or better-off spillovers to benefit the poor, that cannot be captured using conventional approaches. Lastly, the effects of the different dimensions of relative deprivation on occupational choices and well-being indicate that limiting relative deprivation analyses to income spheres is misleading and doing so may fail to capture the multifaceted effect of relative deprivations on the well-being, occupational choice, or labor market analyses of rural young people. Therefore, disaggregating the effects of relative deprivations on occupational choices and well-being are important and doing so provide useful information to identify and design interventions aimed to tackle rural under-development. As Yitzhaki (2002) illustrates, decomposing an inequality index supplies additional information that is useful for poverty measurement.

Overall, our empirical results do suggest that economic disparities relative to peers are a welfare relevant concern for most rural youth in Ethiopia. In addition, the thesis illustrates that controlling for both father and mother attributes simultaneously in the specifications crucially interacts with the impact of some of the variables of interest. For instance, unlike the conventional approach of controlling for household head characteristics, controlling for both father and mother attributes simultaneously brings more information into the regression and may increase or alter the predictive power of some of the variables of interest. To develop well-informed interventions aimed at improving youth employment and rural transformation, the thesis also indicates the following policy implications:

To increase youth employment in agriculture and reduce youth unemployment and underemployment as well as infuse rural development, it is necessary to improve the resource base of the marginalized youth, specifically for those youth who are trapped in structural poverty. Putting micro-financial institutions in place helps to liquidity and input supply constraints. Such kinds of institutions have to facilitate and

encourage youth as well as parents to make use of credit for productive investments. Thus, explicit consideration of the relatively highly deprived households and improvement in land and labor markets could help to convert deprivation into opportunities and ameliorate the situations of the left-behind. This requires better coordination within households, communication, and cooperation between different government departments, civil society, NGOs, and the private sector.

Development interventions that target few people in rural areas will create significant welfare externalities- in terms of technology adoption, increase labor force participation, etc. Interventions targeting youth should also consider intra-household heterogeneity in preferences and resource distributional issues. At the same time, there is a need to reducing relative poverty (despite targeting absolute poverty reduction strategies) and addressing resource inequalities including wealth, non-income and social inequalities by designing appropriate redistributive policies, especially among the very poor. This requires appropriate and careful development policies. Agriculture, in the long run, may become a workplace of left behind male youth since female youth are more likely to choose livelihood options outside agriculture. Thus, policies need to readdress consequences of such inequality and deprivation. There is also a need to invest on the human capital of youth and institutions including agribusiness to make use of demographic dividend and reduce poverty. It is also necessary to reduce vulnerability and promote productive youth's employment such as off-farm, support systems, and interventions needed to build skills and prepare young people working in agriculture to successfully enter or access markets. Thus, investment in agribusiness is necessary to infuse agriculture with entrepreneurs. It is hoped that the information generated would inform policy for urgent actions, help to contribute to the current policy debate, and helpful to design programs and projects aimed at youth development. Our findings have also implications for poverty reduction, poverty measurements, and inclusive growth and suggest possible positive external effects arising from the provision of local private goods (entrepreneurship), local employment opportunities, or productivity-enhancing spillovers.

Finally, the thesis suggests that future research should devote to exploring the relevance of the different dimensions of RD and its implications for the growing inequality. Future research should also focus on the important role of multidimensional measurement of relative deprivation and/or inequality in other developing countries, especially in Africa, in order to understand broadly the effect of relative deprivations on the well-being of young people. In addition, further research is needed to understand the mechanisms through which relative concerns could affect aspirations (or positive external effects) without exacerbating further inequalities or poverty. Furthermore, addressing the methodological challenges in measuring RD are fertile grounds for future research, including the development of innovative approaches to the measurements and weighting of the different components of multidimensional RD indices.

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APPENDICES

Table A2.1. Migrants and non-migrants (who are still working in farming) characteristics

Variables	Migrants	Non-migrants
Gender (%)		
Male	55	62
Female	45	38
Age of migrant(years)	22.76	21.64
Average education (years)	2.80	2.4
Work at destination (main) %		
Farming	31.46	53.33
Domestic	16.85	13.00
Student	16.85	33.67

Source: Own computation from household and youth survey data in 2010/11 and 2014/15

Table A2.2. First stage regressions for shadow wages

VARIABLES	(1) Male shadow wage	(2) Female shadow wage	(3) Male mature shadow wage	(4) Female mature shadow wage	(5) Child shadow wage	(6) Shadow income
youthdensity	0.267***	0.391***	0.184**	0.026	0.449***	0.354**
roof_corrug	-0.071	-0.078	-0.073	-0.104	-0.126	-0.163
floor_conc	0.028	-0.101	-	0.165	0.200	-0.248
woodstove	-0.071	-0.076	-	-0.102	-0.128	-0.169
mosvolbed	1.332*	0.374	-0.902	-1.221	-	-
mobile	-0.800	-0.379	-0.871	-1.144	-	-
radioo	-	0.280**	0.162	0.259	-0.715***	0.571*
jewlery	0.137**	-0.128	-0.134	-0.171	-0.220	-0.292
cart	-0.065	0.000	-0.025	-0.069	0.119	-0.226
water_riv_rain	0.133**	-0.070	-0.068	-0.093	-0.115	-0.152
water_pip_dry	-0.060	0.093	-0.003	-0.047	-0.029	-
Constant	-0.060	-0.064	-0.065	-0.086	-0.106	-
Other controls	0.022	0.127*	-	-0.070	0.080	0.021
Time FE	-0.066	-0.070	-	-0.094	-0.117	-0.155
Observations	-0.019	0.006	-	0.0892*	-0.069	-0.021
R-squared	-0.034	-0.036	-	-0.048	-0.060	-0.080
	0.081	0.414***	0.222	-	-0.432*	-0.237
	-0.137	-0.146	-0.146	-	-0.245	-0.320
	-	-0.054	-0.026	-	0.193	0.029
	-	-0.074	-0.072	-	-0.123	-0.163
	-	0.062	-	0.213	0.147	0.637**
	-	-0.123	-	-0.160	-0.204	-0.267
	-1.871**	-0.176	0.720	1.770	-0.732	7.095***
	(0.902)	(0.577)	(0.984)	(1.290)	(0.786)	(1.482)
	Yes	Yes	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes	Yes	Yes
	1,011	1,011	1,011	1,011	1,011	1,011
	0.316	0.275	0.363	0.271	0.248	0.131

A2.2. Test for exclusion criteria					
VARIABLES	(1) On-farm male SS	(2) On-farm female youth SS	(3) On-farm male mature SS	(4) On-farm female mature SS	(5) On-farm child labor SS

youthdensity	-0.038	-0.034	-0.101	-0.060	0.050
	-0.091	-0.080	-0.079	-0.075	-0.064
roof_corrug	-0.064	0.044	-0.033	0.104	0.049
	-0.091	-0.078	-0.078	-0.074	-0.063
floor_conc	0.643	-0.353	-0.198	-0.178	-
	-1.019	-0.389	-0.880	-0.823	-
woodstove	-	-0.272**	0.011	0.095	-0.354***
		-0.132	-0.135	-0.123	-0.109
mosvolbed	0.016	0.045	0.016	0.072	-0.069
	-0.083	-0.072	-0.070	-0.067	-0.057
mobile	-0.121	-0.156**	-0.018	-0.071	-0.077
	-0.076	-0.066	-0.066	-0.062	-0.053
radioo	0.030	-0.119*		-0.053	0.031
	-0.083	-0.072		-0.067	-0.058
jewlery	-0.037	-0.013		0.005	-0.0548*
	-0.043	-0.037		-0.035	-0.030
cart	0.172	-0.287*	-0.378**		-0.116
	-0.174	-0.151	-0.150		-0.121
water_riv_rain		0.057	0.159**		0.164***
		-0.076	-0.074		-0.061
water_pip_dry		-0.180		0.326***	0.146
		-0.127		-0.115	-0.102
inputprice1		-0.014		-0.044	
		-0.089		-0.079	
Constant	0.165	1.258**	0.390	1.053	1.422***
	(1.148)	(0.593)	(0.996)	(0.928)	(0.476)
Other controls	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	1,011	1,011	1,011	1,011	1,011
R-squared	0.381	0.317	0.340	0.225	0.194

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: SS denotes labor supply

Table A3.1: Design of the experiments

Instructions: income relative deprivation for youth respondent (a replication with some modification of Akay et al. (2011) and Johansson-Stenman et al. (2002):

“I want to ask you questions related to income. Imagine that you can choose to live in one of two different societies, society A and society B. Your monthly income and the average monthly income of people differ between the two societies. Except for the income differences, other things like living expenses are the same in the two societies. For each society that we will consider, I will tell you the amount of your monthly income and the average monthly income of the group. Then I will ask you to choose which society you would like to live in. Let me illustrate this choice by the following example. In this example, we will just name the group of people ‘other youth.’”

Table A.1. A case example presented to youth respondents.

Society	Your own income: birr/month	Average income of other youth: birr/month
Society A	800	900
Society B	770	600
Which society do you choose to live in?		

In this example, your monthly income is 30 birr more in Society A than in Society B. In Society A, you earn 100 birr less than the average income of other youth in the society, while in Society B you get 170 birr more. Given these differences, you can either choose to live in Society A or B. In which Society, A or B1, do you want to live? (*Repeat question and example*).

Now, I’ll ask you to make your choice between the different societies.

(Enumerator: For each table of a reference group, ask the first questions in the following way. Do not change the order the tables from what is given in this questionnaire!)

In Society A, your monthly income is _____ birr, while the average monthly income of _____ in the society is _____ birr. In Society B1, your monthly income is _____ birr, while the average monthly income of _____ in the society is _____ birr. In which Society, A or B1, do you want to live?

(If the respondent chooses A, stop and proceed to the next table. If the respondent chooses B1, ask her/him to choose between Society A and Society B2. If the respondent chooses B2 to ask her/him to choose between Society A and B3. Continue in a similar manner for the rest of the choices. Do not change the format of the question except for the numbers. Follow the same procedure for the other tables. Remember! Do not change the order of the tables as it is given in this printout and always start from the first choice in each table!)

Alternatives in experiment: Youth

Others in the society		
Society	Your own income birr/month	Average income of others birr/month
A	960	1080
B1	924	720
Which society do you choose to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B1, proceed below)		
A	960	1080
B2	888	720
Which society do you choose to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B2, proceed below)		
A	960	1080
B3	852	720
Which society do you choose to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B3, proceed below)		
A	960	1080
B4	816	720
Which society do you choose to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B4, proceed below)		
A	960	1080
B5	780	720
Which society do you choose to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B5, proceed below)		
A	960	1080
B6	744	720
Which society do you choose to live in? (Circle choice.)		
Enumerator: please write in this box clearly and briefly why the respondent made such choices		

Alternatives in experiment: father and mother

Others in the society		
Society	Your son/daughters income birr/month	Average income of other youth: birr/month
A	960	1080
B1	924	720
Which society do you choose your son/daughter to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B1, proceed below)		
A	960	1080
B2	888	720
Which society do you choose your son/daughter to live in?		

(Circle choice. If the choice is A, stop and go to next page, if the choice is B2, proceed below)		
A	960	1080
B3	852	720
Which society do you choose your son/daughter to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B3, proceed below)		
A	960	1080
B4	816	720
Which society do you choose your son/daughter to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B4, proceed below)		
A	960	1080
B5	780	720
Which society do you choose your son/daughter to live in? (Circle choice. If the choice is A, stop and go to next page, if the choice is B5, proceed below)		
A	960	1080
B6	744	720
Which society do you choose your son/daughter to live in? (Circle choice.)		
Enumerator: please write in this box clearly and briefly why the respondent made such choices		

Table A3.2: The general Edenred-Ipsos Barometer measure of well-being

		Scale for responses 01-05;
1	Proud of residential places	
2	I am proud of my clothes	
3	I feel proud of the job done by my parents	
4	I am proud of the work I have to do	
5	I feel proud to show my friends or other visitors where I live	
6	If I try hard, I can improve my situation in life	
7	The job I do makes me feel proud	
8	I can improve my life condition	
9	Other people in my STREET/VILLAGE look down on me and my family	
10	When I am at community/school/ gatherings/market I am usually treated by others with fairness and with respect	
11	Make his/her own life decisions	
	Dummy variables	1=yes, 0 otherwise
12	Able to get loan	
13	Parental divorce	
14	Alcohol abuse	
15	Parental illness	
16	Poor relation with parents	
17	School performance	

Note: scales 01=Strongly disagree; 02= disagree; 03= more or less; 04= agree; 05=Strongly agree

Appendix A3.4: Specification and description of ordered probit model

The response probabilities for our ordered probit model with five alternatives can be expressed as follows:

$$P(SWB_{(i,h)} = m) = \frac{\exp(X_i\beta - k_{M-1})}{1 + [\exp(X_i\beta - k_{m-1})]}$$

Where M is cut-off terms in this case 5 and denotes the five ordinal categories constructed from the life satisfaction asking subjects to rate their life satisfaction on 1 to 9 scales (1 indicating the worst possible life and 9 the best possible life). Xi is a vector that denotes different factors that affect well-being of youth i in the household h, including the main variables of interest, marginal degree of positionality for the three categories (youth, fathers and mothers), individual and household characteristics (especially father and mother characteristics), local institutions and community characteristics expected to influence subjective well-being.

Table A3.5: Logit estimate of determinants of marginal positional concerns of different groups

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Youth			Members	father	mother	head
	All	Members	Head				
<i>Youth characteristics</i>							
Female youth	-0.00559 (0.0527)	0.0669 (0.0589)	-0.177 (0.121)	-0.0308 (0.0807)	0.0766 (0.0683)	-0.0793 (0.0584)	0.00435 (0.0547)
Youth has no mobile phone	0.0696* (0.0418)	0.0714 (0.0500)	0.0421 (0.0766)	0.111 (0.0698)	-0.165*** (0.0586)	-0.0423 (0.0494)	-0.145*** (0.0453)
Age	0.00670 (0.00604)	0.00812 (0.00793)	0.00816 (0.00963)	-0.00237 (0.0118)	-0.00656 (0.00999)	-0.00296 (0.00820)	-0.00789 (0.00779)
Education(years)	0.00884 (0.00659)	0.0101 (0.00802)	0.00878 (0.0117)	-0.0148 (0.0113)	0.00739 (0.00970)	0.0221*** (0.00787)	0.00860 (0.00741)
Currently student	0.0404 (0.0532)	0.0555 (0.0576)	-0.0705 (0.331)	0.122 (0.0825)	0.0163 (0.0759)	0.00538 (0.0543)	0.0166 (0.0551)
Youth relationship to head(1 if member and zero otherwise)	-0.0394 (0.0734)			0.121 (0.631)		0.397** (0.169)	-0.0386 (0.253)
Birth order	-0.00883 (0.0757)	-0.00345 (0.0840)	-0.0316 (0.185)	0.141 (0.106)	0.0572 (0.0879)	-0.0850 (0.0867)	0.0456 (0.0723)
First born son	0.0256 (0.0926)	0.121 (0.108)	-0.0665 (0.205)	-0.133 (0.139)	-0.133 (0.114)	-0.0493 (0.107)	-0.191* (0.0982)
# of male youth in the household 13-34 years	-0.0127 (0.0248)	-0.00388 (0.0267)	-0.0415 (0.0767)	-0.0427 (0.0347)	0.00786 (0.0318)	-0.0350 (0.0269)	-0.00933 (0.0258)
# of female youth in the household 13-34 years	0.0180 (0.0254)	-0.00126 (0.0274)	0.261*** (0.0937)	0.0141 (0.0381)	-0.0939** (0.0370)	-0.00382 (0.0255)	-0.0398 (0.0246)
Have separate cash income	0.0180 (0.0429)	0.0338 (0.0531)	-0.0142 (0.0752)	0.200*** (0.0740)	0.00993 (0.0683)	-0.0301 (0.0508)	-0.0364 (0.0485)
<i>Father characteristics</i>							
Age				0.000131 (0.00503)	0.00314 (0.00279)		
Education (years)				0.0182* (0.0107)	0.00846 (0.0102)		
Married to single spouse				0.119 (0.127)	0.0315 (0.104)		
<i>Mother characteristics</i>							
Age				0.00877 (0.00610)		-0.00696*** (0.00251)	
Education(years)				0.0301 (0.0192)		0.0275** (0.0135)	
Relationship to head (1- head, 0 otherwise)						-0.00644 (0.0508)	
<i>Head characteristics</i>							
Female-headed							0.0438 (0.0528)
Age of the household head							-0.00234 (0.00227)
education of household head(years)							0.00848 (0.00960)
Married to single spouse							-0.0129 (0.0334)
<i>Household assets</i>							
Farm size per own child(in hectares)	-0.0456 (0.0338)	-0.0690* (0.0365)	-0.0553 (0.110)	-0.195** (0.0772)	-0.0495 (0.0553)	-0.00896 (0.0388)	-0.0143 (0.0312)
Log(per capita income in Birr)	0.0469** (0.0236)	0.0800*** (0.0299)	0.00830 (0.0429)	0.0382 (0.0498)	-0.0568 (0.0352)	-0.000345 (0.0304)	-0.0230 (0.0335)
Livestock holding (tlu)	0.00197 (0.00246)	0.00132 (0.00263)	0.000425 (0.00838)	0.00764* (0.00427)	0.00122 (0.00274)	0.00585** (0.00249)	0.00403* (0.00206)
Roof of the main house is made of corrugated iron	-0.0448 (0.0459)	-0.0514 (0.0561)	-0.0775 (0.0811)	-0.0682 (0.0808)	0.0977 (0.0631)	-0.0147 (0.0527)	0.0869* (0.0512)
There is electricity in the PA	0.0218 (0.0593)	-0.00615 (0.0704)	0.0267 (0.116)	-0.0697 (0.106)	-0.0833 (0.0729)	-0.0492 (0.0706)	-0.127** (0.0603)
Have no access to public pipe water	0.0675 (0.0986)	0.121 (0.126)	0.0749 (0.170)	0.220 (0.181)	-0.0486 (0.137)	0.177** (0.0859)	0.0660 (0.0966)
There is no youth related projects and programs in the PA	0.128* (0.0732)	0.0364 (0.0888)	0.175 (0.121)	0.192* (0.114)	0.0188 (0.0997)	-0.00589 (0.0874)	0.0417 (0.0794)
has no land certificate	0.130 (0.104)	0.135 (0.126)	0.105 (0.182)	0.224 (0.169)	-0.0760 (0.148)	-0.0478 (0.146)	-0.0739 (0.121)
Saving and credit institutions are available in the PA	0.0298 (0.0733)	-0.0176 (0.0915)	0.0253 (0.123)	0.115 (0.112)	0.115 (0.103)	0.323*** (0.0840)	0.179** (0.0832)
District dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	638	442	196	233	281	394	443

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A3.6: determinants of marginal degree of positionality disaggregated by gender: youth, father and mother -marginal effects of the logit model

VARIABLES	(1)	(2)	(3) Youth positional concerns		(5)	(6)	(7)	(8)	(9)	(10) Head positional concern		(11)
	All	Sons	Daughters	Sons	Daughters	Sons	Daughters	Sons	Daughters	Sons	Daughters	Daughters
<i>Youth characteristics</i>												
Female youth	-0.00604 (0.0496)											
Youth has no mobile phone	0.0700* (0.0421)	0.0933* (0.0527)	0.0567 (0.0730)	0.132 (0.0900)	0.0733 (0.104)	-0.0453 (0.0878)	-0.413*** (0.0933)	-0.0474 (0.0638)	-0.00765 (0.0717)	-0.109* (0.0649)	-0.220*** (0.0649)	
Age	0.00684 (0.00615)	0.00571 (0.00753)	0.00644 (0.0108)	0.0167 (0.0168)	-0.0120 (0.0191)	0.0118 (0.0145)	-0.0269 (0.0173)	0.00306 (0.0114)	-0.0249* (0.0146)	-0.00119 (0.0106)	-0.0177 (0.0125)	
Education(years)	0.00885 (0.00664)	0.0116 (0.00846)	-0.00168 (0.0118)	-0.00726 (0.0154)	-0.0135 (0.0186)	0.0166 (0.0137)	-0.00233 (0.0175)	0.0136 (0.0109)	0.0238** (0.0118)	0.0172 (0.0110)	0.00169 (0.0120)	
Currently student	0.0408 (0.0527)	0.00669 (0.0699)	0.0732 (0.0876)	0.243** (0.119)	0.0501 (0.146)	0.0247 (0.0939)	0.0577 (0.111)	-0.00208 (0.0770)	0.0192 (0.0860)	0.0412 (0.0731)	-0.0231 (0.0800)	
Birth order	0.00265 (0.00975)	0.00925 (0.0152)	-0.0120 (0.0132)	0.0464 (0.0315)	-0.0205 (0.0286)	-0.0497** (0.0251)	-0.0273 (0.0185)	0.0367** (0.0149)	0.0208 (0.0147)	-0.0288 (0.0188)	-0.00490 (0.0134)	
First born son	0.0247 (0.0611)	0.0475 (0.0707)		0.0836 (0.125)		-0.189* (0.107)				-0.206** (0.0853)		
Youth relationship to head(1 if member and zero otherwise)	-0.0407 (0.0748)	-0.0350 (0.0885)	-0.115 (0.144)	-0.282 (0.826)				0.432* (0.224)	0.257 (0.271)		0.118 (0.276)	
# of male youth in the household 13-34 years	-0.0126 (0.0245)	-0.0264 (0.0354)	0.00183 (0.0359)	-0.0757 (0.0525)	-0.0771 (0.0550)	0.0128 (0.0475)	-0.0728 (0.0534)	-0.0595 (0.0374)	0.0276 (0.0342)	-0.00685 (0.0390)	-0.0150 (0.0359)	
# of female youth in the household 13-34 years	0.0181 (0.0255)	0.00185 (0.0354)	0.0160 (0.0385)	-0.0291 (0.0505)	0.0616 (0.0584)	-0.0857* (0.0498)	-0.128** (0.0619)	-0.00969 (0.0361)	-0.000194 (0.0370)	-0.0242 (0.0371)	-0.0604 (0.0401)	
Have separate cash income	0.0176 (0.0427)	0.0674 (0.0529)	-0.0500 (0.0788)	0.301*** (0.0917)	0.0167 (0.141)	0.00955 (0.0819)	0.0232 (0.107)	-0.107* (0.0640)	0.156* (0.0830)	-0.0916 (0.0632)	0.00476 (0.0763)	
Water source during dry season (1 if and 0 otherwise)	-0.000562 (0.0471)	0.0204 (0.0594)	0.00299 (0.0796)	0.255** (0.121)	-0.111 (0.143)	0.0747 (0.0980)	0.0455 (0.107)	-0.0567 (0.0822)	0.0378 (0.0800)	0.0770 (0.0758)	0.0636 (0.0782)	
<i>Father characteristics</i>												
Age				-0.00933 (0.0075)	-0.00960 (0.00775)	0.00299 (0.00482)	0.00787 (0.00513)					
Education (years)				0.00693 (0.0152)	0.0161 (0.0168)	0.00112 (0.0139)	0.0125 (0.0131)					
Married to single spouse				0.457** (0.218)	0.00484 (0.167)	0.0186 (0.139)	0.264* (0.155)					
<i>Mother characteristics</i>												
Age				0.0167* (0.0088)	0.0154 (0.0115)			-0.00757** (0.00357)	-0.0135*** (0.00400)			
Education(years)				0.0244 (0.0265)	0.0737* (0.0387)			0.0319** (0.0155)	0.0102 (0.0209)			
Relationship to head (1- head, 0 otherwise)								-0.0705 (0.0675)	0.0268 (0.0720)			
<i>Head characteristics</i>												
Female-headed										0.0467 (0.0719)	0.0550 (0.0770)	
Age of the household head										0.000205 (0.00306)	-0.00595* (0.00317)	
education of household head(years)										0.00912 (0.0121)	0.00698 (0.0125)	
Married to single spouse										0.00889 (0.0526)	-0.0256 (0.0464)	
Household assets												
Farm size per own child(in hectares)	-0.0456	-0.0645	2.02e-05	-0.202**	-0.234	-0.161	-0.119	-0.0520	0.168**	-0.0942*	0.0397	

	(0.0360)	(0.0416)	(0.0734)	(0.101)	(0.156)	(0.0982)	(0.112)	(0.0366)	(0.0757)	(0.0564)	(0.0722)
Log(per capita income in Birr)	0.0471**	0.0409	0.0411	-0.00302	0.0958	0.0175	-0.140***	0.0463	-0.121**	0.0794*	-0.144***
	(0.0233)	(0.0318)	(0.0386)	(0.0638)	(0.0859)	(0.0578)	(0.0430)	(0.0418)	(0.0522)	(0.0406)	(0.0384)
Livestock holding (tlu)	0.00199	0.000279	0.00875	0.00962**	0.0125	-0.00307	0.0149**	0.00397	0.00660	0.000973	0.0117**
	(0.00251)	(0.00282)	(0.00547)	(0.0044)	(0.00828)	(0.00398)	(0.00635)	(0.00281)	(0.00485)	(0.00299)	(0.00457)
Roof of the main house is made of corrugated iron	-0.0448	-2.79e-05	-0.0932	-0.158	-0.0178	0.110	0.195**	0.0300	-0.0846	0.0480	0.111
	(0.0445)	(0.0599)	(0.0761)	(0.118)	(0.143)	(0.0935)	(0.0982)	(0.0725)	(0.0805)	(0.0735)	(0.0768)
There is electricity in the PA	0.0225	0.00820	0.0714	-0.115	0.128	-0.0268	-0.186	-0.00802	-0.0251	-0.142	-0.111
	(0.0578)	(0.0763)	(0.0981)	(0.145)	(0.202)	(0.131)	(0.119)	(0.116)	(0.0967)	(0.0982)	(0.0919)
Have no access to public pipe water	0.0682	-0.0869	0.368*	-0.117	2.613	0.0358	-0.331	0.314**	-0.0668	0.0446	-0.0669
	(0.0961)	(0.121)	(0.190)	(0.270)	(134.6)	(0.213)	(0.228)	(0.144)	(0.165)	(0.144)	(0.159)
There is no youth related projects and programs in the PA	0.127*	0.169*	0.0662	-0.0166	0.378*	0.0822	0.120	-0.00733	0.0493	0.0681	0.108
	(0.0724)	(0.0892)	(0.121)	(0.156)	(0.226)	(0.139)	(0.169)	(0.128)	(0.127)	(0.111)	(0.121)
has no land certificate	0.129	0.0298	0.348*	0.119	0.601**	-0.0300	0.225	0.0527	-0.0467	-0.0928	0.227
	(0.105)	(0.139)	(0.184)	(0.243)	(0.282)	(0.290)	(0.296)	(0.216)	(0.177)	(0.220)	(0.194)
Saving and credit institutions are available in the PA	0.0302	0.0401	-0.0415	-0.0184	0.0935	0.208	0.0252	0.446***	0.230*	0.194	0.134
	(0.0724)	(0.0948)	(0.122)	(0.163)	(0.212)	(0.153)	(0.158)	(0.136)	(0.119)	(0.122)	(0.119)
District dummies	Yes										
Observations	638	407	222	125	105	157	124	215	179	244	196

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable –is 0 if a subject chooses society A in the first choice and 1 otherwise. All predictors at their mean values.

Table A3.7: Determinants of subjective well-being for youth by gender: ordered logit results

VARIABLES	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
	Using youth characteristics only			using youth and parents characteristics			Using youth and head characteristics											
	All	Sons	Daughters	All	Sons	Daughters	All	Sons	Daughters	All	Sons	Daughters	All	Sons	Daughters	All	Sons	Daughters
<i>Positional concerns</i>																		
Youth positional concern (1 if a youth subject chooses society Bi in the first choice and 0 if A in the first choice)	0.445***	0.457**	0.492*	0.471*	0.411	1.032**	0.404**	0.414	0.534*	(0.150)	(0.191)	(0.265)	(0.274)	(0.420)	(0.522)	(0.182)	(0.255)	(0.293)
Father positional concern (1 if a father subject chooses society Bi in the first choice and 0 if A in the first choice)							1.158***	1.223***	1.463***				(0.305)	(0.445)	(0.549)			
Mother positional concern (1 if another subject chooses society Bi in the first choice and 0 if A in the first choice)							-0.357	0.700	-1.287**				(0.311)	(0.484)	(0.561)			
Head positional concern (1 if a head subject chooses society Bi in the first choice and 0 if A in the first choice)																0.680***	0.805***	0.622*
																(0.198)	(0.274)	(0.318)
<i>Youth characteristics</i>																		
Female youth	0.0855						-0.183									-0.00512		
	(0.188)						(0.341)									(0.224)		
Youth has no mobile phone	-0.264*	-0.209	-0.493*	0.164	0.227	-0.309	0.0162	0.319	-0.312									
	(0.155)	(0.197)	(0.280)	(0.298)	(0.436)	(0.565)	(0.193)	(0.271)	(0.310)									
Age	0.0456***	0.0449**	0.0677**	0.0286	0.0262	0.0249	0.0512	0.0542	0.0341									
	(0.0164)	(0.0204)	(0.0319)	(0.0512)	(0.0844)	(0.0861)	(0.0313)	(0.0453)	(0.0503)									
Education(years)	0.0212	0.0328	0.0190	-0.0323	-0.00136	-0.147*	0.00810	0.0345	0.0229									
	(0.0250)	(0.0325)	(0.0439)	(0.0491)	(0.0749)	(0.0879)	(0.0318)	(0.0452)	(0.0519)									
Currently student	0.798***	0.856***	1.132***	1.281***	1.427**	2.995***	0.796***	0.917***	1.003***									
	(0.202)	(0.265)	(0.347)	(0.379)	(0.601)	(0.697)	(0.229)	(0.327)	(0.372)									
Birth order	0.0278	-0.0819	0.131**	0.129*	-0.102	0.258*	0.0801*	-0.0730	0.216***									
	(0.0366)	(0.0557)	(0.0537)	(0.0779)	(0.157)	(0.132)	(0.0462)	(0.0777)	(0.0641)									
First born is son	0.338	0.0548	0.600	0.392	0.392	0.307	0.307	-0.0812										
	(0.235)	(0.269)		(0.429)	(0.570)		(0.305)	(0.372)										
<i>Father characteristics</i>																		
Age							-0.0424**	-0.0379	-0.0354									
							(0.0211)	(0.0372)	(0.0364)									

Education(years)						-0.0307 (0.0461)	0.0260 (0.0764)	-0.149* (0.0821)		
Married to single spouse						0.107 (0.539)	-0.353 (0.989)	1.771* (0.921)		
<i>Mother characteristics</i>										
Age						0.0348 (0.0267)	0.0487 (0.0427)	0.0277 (0.0496)		
Education (years)						-0.0445 (0.0807)	-0.0244 (0.113)	-0.0391 (0.164)		
<i>Head characteristics</i>										
Sex									-0.313 (0.211)	-0.114 (0.299)
Age									-0.0110 (0.00892)	-0.00601 (0.0126)
Education(years)									0.0126 (0.0363)	0.0600 (0.0514)
Married to single spouse									0.0924 (0.147)	0.168 (0.218)
# of male youth in the household 13-34 years						-0.0719 (0.0929)	-0.0895 (0.136)	-0.132 (0.141)	-0.108 (0.148)	0.0359 (0.255)
# of female youth in the household 13-34 years						-0.0713 (0.0985)	-0.0982 (0.139)	-0.00566 (0.152)	0.0237 (0.179)	0.0215 (0.264)
<i>Household assets</i>										
Farm size per own child(in hectares)						0.321** (0.152)	0.369* (0.190)	0.0954 (0.322)	1.121*** (0.379)	1.684*** (0.550)
Log(per capita income in Birr)						0.166* (0.0936)	0.198 (0.125)	0.107 (0.156)	0.247 (0.217)	0.0373 (0.335)
Livestock holding (tlu)						0.0328*** (0.00982)	0.0386*** (0.0123)	0.0336* (0.0185)	0.00687 (0.0169)	0.0370 (0.0244)
Roof of the main house is made of corrugated iron						0.451*** (0.171)	0.289 (0.222)	0.503* (0.288)	0.753** (0.336)	0.144 (0.488)
There is electricity in the PA						-0.405* (0.220)	-0.297 (0.286)	-0.184 (0.390)	-0.0889 (0.401)	0.243 (0.643)
Have no access to public pipe water						-0.604* (0.367)	-0.703 (0.448)	-0.736 (0.684)	-1.608** (0.742)	-0.370 (0.989)
There is no youth related projects and programs in the PA						0.639** (0.276)	0.446 (0.355)	1.095** (0.472)	0.309 (0.511)	-0.524 (0.815)
has no land certificate						0.875** (0.420)	0.297 (0.531)	2.337*** (0.769)	1.079 (0.769)	-0.0927 (1.207)
Saving and credit institutions are available in the PA						-0.0576 (0.276)	0.0168 (0.360)	-0.132 (0.463)	0.0200 (0.513)	-0.468 (0.842)
District dummies						Yes	Yes	Yes	Yes	Yes
Observations						638	407	231	233	125

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: dependent variable: youth subjective well-being is based on the GHQ-12 measure obtained by summing up 15 questions and categorized into 5 ordered values. The test for cut points confirms that the cut points are different from zero.

Table A4.1: Summary of descriptive statistics of covariates

Variables	Contracted as	Mean	Std. Dev.	Min	Max
Subjective wellbeing	SWB	3.81	1.67	1	9
Female youth	2.ressex	0.37	0.48	0	1
Youth has mobile phone	2.resmobile	0.53	0.50	0	1
Age of youth	resage	19.95	6.05	12	34
Education of youth (years)	edu_youth	3.52	3.20	0	14
Currently attending school	curr_stud	0.38	0.49	0	1
Birth order (rank)	birth_order	3.34	2.33	1	14
First born is son	First_son	3.35	2.33	1	14
Youth has mobile phone	2.resmobile	0.48	0.49	0	1
# of male youth in the household 13-34 years	Youth_male	1.35	1.05	0	7
# of female youth in the household 13-34 years	Youth_female	1.25	0.90	0	5
# of male mature in the household >34 years	Mature_male	0.57	0.68	0	3
# of female mature in the household >34 years	mature_fem	0.74	0.66	0	4
# of children in the household[5-12]	Childern_tot	1.48	1.15	0	5
Water source during dry seasons:	water_sourcedry				
River	2.water_sourcedry	0.22	0.38	0	1
Rain water	3.water_sourcedry	0.02	0.12	0	1
Unprotected well	4.water_sourcedry	0.05	0.21	0	1
Stream	5.water_sourcedry	0.28	0.45	0	1
Protected well	6.water_sourcedry	0.10	0.31	0	1
Piped water	7.water_sourcedry	0.09	0.29	0	1
Other		0.25	0.43	0	1
Land size per own child (in hectares)	land_PC	0.56	0.071	0.01	10.46
Number of livestock owned (TLU)u	totpresnt_tlu	9.78	10.18	0	91.95
Roof of the main house is thatched roof	roofpe2	0.48	0.50	0	1
Youth is household head	youth_rtohead	0.28	0.46	0	1
The PA has access to electricity	electricity1	0.24	0.46	0	1
The PA has access to public pipe water	pubpipewater1	0.52	0.50	0	1
Youth related project available in the PA		0.24	0.43	0	1
Land registration completed	landregcomp1	0.48	0.49	0	1
Saving and credit available in the PA	sav_credit	0.43	0.49	0	1
PA has phone coverage	phoncoverage1	0.83	0.38	0	1
Availability of DA office in the PA	DA_office1	0.97	0.18	0	1
Household head is female	Sexhead	0.28	0.45	0	1
Age of household head to which youth belongs	agehead	43.0	15.18	17	95
Education of household head (years)	eduhead	1.91	2.92	0	14
AGP Woreda	AGP	0.65	0.48	0	1

Source: survey results

Table 4A.1: Introduction used in the survey of occupational choices

<p>Say: We would kindly request you to participate in the following game based (scenarios) on the rules with a scale of 1-10. We want you to point out how likely any situation will occur in the future. For example, if you are asked how likely it will rain tomorrow and if you are totally sure that it will rain tomorrow, then 10 indicates the point of the rule. If you are absolutely sure that it will not rain, 1 indicates the point of the rule. If you are not sure, but believe it is quite possible it will rain, you would place closer to the point of 10 to 1, and if you think that it is very possible that it will not rain, you would place/indicate points closer to 1 to 10. Now let's practice. Can you show me how the rule works? How likely is it going to rain tomorrow? (Please indicate with a pencil or your finger) <i>(If the respondent do not know the answer or fail to answer, try to help him otherwise, fill in DK)</i></p>	
<p>Currently, you are working as 1. Part-time farmer 2. Full-time farmer 3. Full-time non-farm</p>	
<p>1. You are currently working as a part-time farmer. Assume that you continue working as a part-time farmer as your primary occupation. From 1 to 10, how certain are you that you will be working as part-time farmer at the age of 34? [what do you think is the percent chance/what are the chances out of 10/ that you would choose to work part-time when you turn 34]</p>	
<p>Full-time farmer</p>	
<p>2. You are currently working as a full-time farmer. Assume that you continue working as a full-time farmer as your primary occupation. From 1 to 10, how certain are you that you will be working as a full-time farmer at the age of 34?</p>	
<p>Full-time non-farm:</p>	
<p>3. You are currently working as full-time non-farmer and assume that you continue working as full-time non-farmer as your primary occupation. From 1 to 10, how certain are you that you will be working as full-time non-farmer at the age of 34?</p>	
<p>The transition from part-time to the full-time farmer:</p>	
<p>4. You are currently working as a part-time farmer. Assume that you want to engage as full-time farmer and this is the decision you make to work as your primary occupation. From 1 to 10, how certain are you that you will be working as a full-time farmer at the age of 34?</p>	
<p>5. Currently, you are working as a part-time farmer. Assume that you are engaged as full time nonfarm and this is the decision you make to work as your primary occupation. From 1 to 10, how certain are you that you will be working as full-time nonfarm at the age of 34?</p>	
<p>Say: Now I am going to ask you about the possibilities of your future occupational decisions in a different way. Given your current situation, you have three possibilities: that you continue as a part-time farmer, that you shift from part-time to the full-time farmer, and that you exit from agriculture and engage in full-time non-farm employment. I will ask you about the three possibilities.</p>	
<p>6. Do you think that you will continue farming either [as part-time or full time? Enumerator: chose the current activity that the respondent is engaged] at the age of 34? 1. Very likely 2. Likely 3. Unlikely 4. Very unlikely</p>	
<p>7. If you are currently working as a part-time farmer, do you think that you will change your work from part-time farming to full-time farming at the age of 34? 1. Very likely 2. Likely 3. Unlikely 4. Very unlikely</p>	
<p>8. If you are currently working as a part-time farmer, do you think that you will change your work from part-time farming to full-time non-farming at the age of 34? 1. Very likely 2. Likely 3. Unlikely 4. Very unlikely</p>	

Table A4.2: Random effects estimation results from objective approach: Male youth

VARIABLES	(1) benchmark	(2) hhinc_age	(3) youthtype	(4) edu	(6) religion	(7) village	(8) kebele	(9) woreda	(10) land	(11) TLU	(12) occupation	(13) occup_age	(14) wored_age
2.resmobile	-0.178 (0.346)	-0.294 (0.344)	-0.152 (0.345)	-0.316 (0.345)	-0.300 (0.345)	-0.225 (0.353)	-0.245 (0.348)	-0.295 (0.346)	-0.280 (0.344)	-0.256 (0.344)	-0.302 (0.346)	-0.271 (0.348)	-0.288 (0.348)
resage	0.187 (0.173)	0.164 (0.173)	0.222 (0.172)	0.200 (0.173)	0.207 (0.172)	0.254 (0.173)	0.207 (0.171)	0.204 (0.171)	0.200 (0.173)	0.187 (0.172)	0.209 (0.173)	0.156 (0.172)	0.199 (0.172)
age2	-0.004 (0.0039)	-0.003 (0.0037)	-0.005 (0.0037)	-0.004 (0.0038)	-0.004 (0.0035)	-0.005 (0.0038)	-0.004 (0.0035)	-0.004 (0.0035)	-0.004 (0.0030)	-0.004 (0.0037)	-0.004 (0.0037)	-0.003 (0.0030)	-0.004 (0.0035)
edu_youth	-0.0450 (0.0716)	-0.0365 (0.0716)	-0.0515 (0.0723)	-0.0405 (0.0727)	-0.0395 (0.0714)	-0.0312 (0.0735)	-0.0393 (0.0714)	-0.0368 (0.0713)	-0.0319 (0.0715)	-0.0296 (0.0714)	-0.0452 (0.0714)	-0.0533 (0.0728)	-0.0329 (0.0713)
curr_stud	0.158 (0.295)	0.164 (0.295)	0.165 (0.294)	0.133 (0.296)	0.158 (0.295)	0.0775 (0.289)	0.169 (0.294)	0.146 (0.294)	0.154 (0.294)	0.148 (0.295)	0.0535 (0.307)	0.217 (0.297)	0.150 (0.295)
youth_rtohead	0.413 (0.795)	0.150 (0.786)	0.411 (0.799)	0.0986 (0.786)	0.178 (0.787)	0.100 (0.800)	0.308 (0.792)	0.189 (0.784)	0.240 (0.788)	0.361 (0.784)	0.197 (0.784)	0.696 (0.690)	0.213 (0.788)
birthorder	-0.0449 (0.0810)	0.0213 (0.0818)	-0.0267 (0.0821)	0.0318 (0.0814)	0.0237 (0.0811)	-0.0073 (0.0831)	-0.0161 (0.0806)	0.0172 (0.0816)	0.00240 (0.0813)	-0.0125 (0.0813)	0.0249 (0.0819)	0.00852 (0.0816)	0.00486 (0.0809)
Youth_male	0.374** (0.154)	0.435*** (0.166)	0.385** (0.153)	0.450*** (0.164)	0.434*** (0.165)	0.385** (0.169)	0.358** (0.166)	0.428*** (0.166)	0.403** (0.163)	0.405** (0.165)	0.468*** (0.163)	0.403*** (0.154)	0.424** (0.167)
Youth_female	0.233 (0.162)	0.293* (0.171)	0.230 (0.162)	0.314* (0.176)	0.290* (0.171)	0.213 (0.170)	0.231 (0.172)	0.281 (0.171)	0.266 (0.168)	0.264 (0.171)	0.327* (0.171)	0.263 (0.163)	0.277 (0.170)
Mature_male	0.145 (0.184)	0.199 (0.188)	0.180 (0.186)	0.188 (0.186)	0.174 (0.185)	0.129 (0.187)	0.135 (0.185)	0.172 (0.187)	0.159 (0.186)	0.156 (0.185)	0.203 (0.186)	0.160 (0.185)	0.168 (0.188)
mature_fem	0.269 (0.210)	0.257 (0.214)	0.299 (0.211)	0.257 (0.218)	0.243 (0.215)	0.221 (0.218)	0.235 (0.216)	0.243 (0.216)	0.249 (0.219)	0.243 (0.213)	0.259 (0.215)	0.250 (0.215)	0.241 (0.215)
Children_tot	0.141 (0.121)	0.159 (0.123)	0.142 (0.121)	0.174 (0.125)	0.154 (0.123)	0.104 (0.127)	0.123 (0.125)	0.153 (0.125)	0.137 (0.121)	0.151 (0.122)	0.178 (0.124)	0.144 (0.122)	0.159 (0.125)
2.water_sourcedry	0.404 (0.418)	0.242 (0.419)	0.400 (0.418)	0.230 (0.418)	0.234 (0.419)	0.424 (0.424)	0.334 (0.423)	0.246 (0.420)	0.313 (0.419)	0.344 (0.424)	0.208 (0.416)	0.201 (0.413)	0.280 (0.420)
3.water_sourcedry	-1.075 (1.287)	-1.116 (1.275)	-1.048 (1.298)	-1.124 (1.268)	-1.084 (1.278)	-1.012 (1.262)	-1.050 (1.282)	-1.085 (1.272)	-1.046 (1.265)	-1.092 (1.282)	-1.095 (1.277)	-1.160 (1.289)	-1.097 (1.278)
4.water_sourcedry	0.220 (0.514)	0.109 (0.531)	0.141 (0.522)	0.101 (0.533)	0.106 (0.529)	0.297 (0.513)	0.209 (0.517)	0.113 (0.526)	0.164 (0.528)	0.201 (0.525)	0.0707 (0.529)	0.0337 (0.522)	0.155 (0.526)
5.water_sourcedry	0.379 (0.407)	0.244 (0.410)	0.363 (0.407)	0.238 (0.409)	0.234 (0.412)	0.464 (0.415)	0.320 (0.409)	0.252 (0.411)	0.290 (0.418)	0.357 (0.418)	0.215 (0.408)	0.140 (0.390)	0.299 (0.408)
6.water_sourcedry	0.522 (0.455)	0.417 (0.461)	0.531 (0.455)	0.397 (0.464)	0.387 (0.464)	0.441 (0.455)	0.465 (0.456)	0.394 (0.462)	0.446 (0.463)	0.485 (0.462)	0.418 (0.461)	0.345 (0.461)	0.441 (0.461)
7.water_sourcedry	0.558 (0.523)	0.458 (0.525)	0.556 (0.523)	0.443 (0.528)	0.427 (0.527)	0.601 (0.536)	0.519 (0.524)	0.439 (0.526)	0.478 (0.527)	0.511 (0.531)	0.419 (0.526)	0.407 (0.524)	0.472 (0.526)
8.water_sourcedry	0.513 (0.474)	0.339 (0.481)	0.507 (0.477)	0.326 (0.481)	0.339 (0.482)	0.487 (0.479)	0.465 (0.472)	0.355 (0.480)	0.421 (0.482)	0.480 (0.488)	0.305 (0.480)	0.298 (0.464)	0.394 (0.482)
land_PC	-0.0328 (0.114)	-0.0440 (0.120)	-0.0196 (0.116)	-0.0428 (0.123)	-0.0391 (0.121)	-0.0441 (0.116)	-0.0275 (0.115)	-0.0361 (0.121)	-0.0584 (0.128)	-0.0443 (0.116)	-0.0394 (0.122)	-0.0319 (0.120)	-0.0388 (0.119)
totpresnt_tlu	0.0288** (0.0128)	0.0311** (0.0128)	0.0302** (0.0130)	0.0311** (0.0128)	0.0311** (0.0128)	0.0288** (0.0134)	0.0308** (0.0130)	0.0306** (0.0128)	0.0310** (0.0129)	0.0253* (0.0131)	0.0303** (0.0129)	0.0328** (0.0129)	0.0300** (0.0127)
roof_corrug	0.0224 (0.267)	-0.00231 (0.270)	0.0146 (0.269)	-0.0050 (0.271)	-0.0019 (0.270)	0.0567 (0.266)	0.00693 (0.268)	-0.0095 (0.270)	0.000645 (0.267)	0.00720 (0.267)	-0.00354 (0.272)	-0.0582 (0.272)	-0.00564 (0.269)
electcity	0.00461 (0.285)	0.0509 (0.286)	0.0176 (0.285)	0.0713 (0.286)	0.0613 (0.287)	0.00288 (0.287)	-0.0117 (0.285)	0.0511 (0.287)	0.0124 (0.285)	-0.0292 (0.286)	0.0884 (0.287)	0.0801 (0.288)	0.0252 (0.286)

2.pubpipewater	-0.494*	-0.464*	-0.502*	-0.446*	-0.455*	-0.573**	-0.495*	-0.463*	-0.480*	-0.513*	-0.448*	-0.423	-0.482*
	(0.264)	(0.263)	(0.264)	(0.263)	(0.263)	(0.268)	(0.264)	(0.263)	(0.263)	(0.265)	(0.263)	(0.264)	(0.263)
2.landregcomp	0.00858	0.00228	-0.0225	-0.0202	-0.0051	0.0554	0.0457	0.00147	0.0127	0.0214	-0.00569	0.00324	0.00647
	(0.263)	(0.261)	(0.264)	(0.261)	(0.261)	(0.266)	(0.263)	(0.261)	(0.263)	(0.263)	(0.261)	(0.264)	(0.262)
sav_credit	-0.223	-0.218	-0.207	-0.228	-0.240	-0.219	-0.226	-0.218	-0.213	-0.165	-0.236	-0.260	-0.201
	(0.245)	(0.247)	(0.245)	(0.249)	(0.248)	(0.251)	(0.246)	(0.246)	(0.247)	(0.248)	(0.248)	(0.249)	(0.246)
2.phoncoverage	0.469	0.524	0.495	0.522	0.539	0.362	0.459	0.505	0.504	0.446	0.518	0.576	0.490
	(0.369)	(0.370)	(0.370)	(0.371)	(0.370)	(0.367)	(0.369)	(0.370)	(0.368)	(0.371)	(0.370)	(0.374)	(0.370)
2.DA_office	0.430	0.455	0.400	0.461	0.465	0.435	0.434	0.441	0.433	0.404	0.465	0.567	0.439
	(0.382)	(0.380)	(0.380)	(0.377)	(0.378)	(0.386)	(0.381)	(0.379)	(0.382)	(0.378)	(0.377)	(0.373)	(0.379)
2014_year	3.922***	3.916***	3.941***	3.895***	3.896***	3.893***	3.908***	3.899***	3.895***	3.887***	3.937***	4.068***	3.905***
	(0.402)	(0.407)	(0.402)	(0.398)	(0.399)	(0.407)	(0.399)	(0.398)	(0.406)	(0.397)	(0.401)	(0.393)	(0.401)
Observations	743	743	743	743	743	733	743	743	743	743	743	743	743

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A4.2: Random effects estimation results from objective approach: female youth

VARIABLES	(1)	(2)	(3)	(4)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	benchmark	hhinc_age	youthtype	edu	village	kebele	woreda	land	TLU	occupation	occup_age	wored_age
	(0.426)	(0.425)	(0.424)	(0.427)	(0.429)	(0.430)	(0.428)	(0.419)	(0.430)	(0.428)	(0.429)	(0.427)
resage	0.147	0.113	0.126	0.131	0.0760	0.133	0.127	0.131	0.159	0.133	0.123	0.131
	(0.292)	(0.293)	(0.293)	(0.293)	(0.297)	(0.294)	(0.292)	(0.294)	(0.293)	(0.293)	(0.293)	(0.293)
age2	-0.00246	-0.00179	-0.00195	-0.00194	-0.00112	-0.00202	-0.00174	-0.00183	-0.00240	-0.00205	-0.00253	-0.00187
	(0.00675)	(0.00675)	(0.00676)	(0.00674)	(0.00695)	(0.00683)	(0.00677)	(0.00679)	(0.00678)	(0.00672)	(0.00678)	(0.00681)
edu_youth	0.0394	0.0547	0.0465	0.0496	0.0823	0.0480	0.0533	0.0645	0.0509	0.0681	0.0499	0.0575
	(0.0780)	(0.0794)	(0.0806)	(0.0797)	(0.0801)	(0.0798)	(0.0791)	(0.0822)	(0.0780)	(0.0819)	(0.0784)	(0.0794)
curr_stud	0.279	0.297	0.321	0.257	0.292	0.290	0.294	0.264	0.343	0.139	0.465	0.303
	(0.333)	(0.333)	(0.338)	(0.338)	(0.334)	(0.332)	(0.329)	(0.346)	(0.332)	(0.347)	(0.339)	(0.330)
youth_rtohead	-0.271	-0.255	-0.177	-0.333	0.130	-0.342	-0.388	-0.306	-0.398	-0.322	-0.300	-0.301
	(1.187)	(1.228)	(1.198)	(1.221)	(1.171)	(1.204)	(1.218)	(1.228)	(1.194)	(1.238)	(1.197)	(1.228)
birthorder	0.230**	0.246***	0.236***	0.242**	0.250***	0.231**	0.235**	0.265***	0.262***	0.244**	0.245**	0.243**
	(0.0922)	(0.0947)	(0.0914)	(0.0938)	(0.0950)	(0.0935)	(0.0942)	(0.0956)	(0.0951)	(0.0951)	(0.0954)	(0.0948)
Youth_male	0.0778	0.174	0.0936	0.160	0.123	0.120	0.183	0.178	0.216	0.201	0.138	0.191
	(0.186)	(0.201)	(0.186)	(0.201)	(0.197)	(0.190)	(0.197)	(0.201)	(0.188)	(0.204)	(0.194)	(0.197)
Youth_female	0.329*	0.443**	0.321*	0.437**	0.444**	0.375*	0.453**	0.449**	0.521***	0.479**	0.417**	0.466**
	(0.188)	(0.196)	(0.191)	(0.198)	(0.198)	(0.195)	(0.200)	(0.190)	(0.200)	(0.198)	(0.195)	(0.199)
Mature_male	0.111	0.136	0.121	0.136	0.227	0.124	0.141	0.151	0.141	0.145	0.105	0.136
	(0.304)	(0.305)	(0.306)	(0.306)	(0.298)	(0.304)	(0.304)	(0.307)	(0.304)	(0.307)	(0.307)	(0.305)
mature_fem	-0.266	-0.203	-0.238	-0.207	-0.198	-0.238	-0.183	-0.171	-0.146	-0.181	-0.197	-0.181
	(0.257)	(0.258)	(0.262)	(0.258)	(0.268)	(0.260)	(0.260)	(0.254)	(0.257)	(0.258)	(0.261)	(0.260)
Children_tot	0.0957	0.163	0.125	0.148	0.194	0.125	0.178	0.135	0.208	0.187	0.158	0.184
	(0.155)	(0.162)	(0.155)	(0.161)	(0.157)	(0.160)	(0.161)	(0.161)	(0.164)	(0.165)	(0.166)	(0.164)
2.water_sourcedry	0.584	0.607	0.541	0.640	0.516	0.571	0.553	0.707	0.470	0.606	0.609	0.572
	(0.558)	(0.542)	(0.558)	(0.546)	(0.566)	(0.550)	(0.541)	(0.548)	(0.540)	(0.547)	(0.544)	(0.540)
3.water_sourcedry	2.042	2.216	2.068	2.237	2.096	2.075	2.113	2.677**	2.317*	2.263	2.298*	2.179
	(1.384)	(1.398)	(1.405)	(1.413)	(1.454)	(1.396)	(1.419)	(1.269)	(1.384)	(1.402)	(1.343)	(1.392)
4.water_sourcedry	1.737*	1.740*	1.771*	1.796**	1.528*	1.724*	1.688*	1.744**	1.673*	1.752**	1.836**	1.751*
	(0.892)	(0.890)	(0.911)	(0.894)	(0.909)	(0.906)	(0.915)	(0.875)	(0.875)	(0.893)	(0.892)	(0.907)
5.water_sourcedry	0.820	0.878	0.776	0.909*	0.725	0.808	0.792	0.976*	0.800	0.873	0.871	0.826
	(0.545)	(0.542)	(0.544)	(0.544)	(0.579)	(0.543)	(0.547)	(0.548)	(0.546)	(0.551)	(0.541)	(0.544)

6.water_sourcedry	1.182**	1.233**	1.070*	1.258**	1.132*	1.172**	1.175**	1.320**	1.232**	1.213**	1.161**	1.194**
	(0.579)	(0.582)	(0.583)	(0.582)	(0.601)	(0.576)	(0.584)	(0.599)	(0.593)	(0.589)	(0.571)	(0.586)
7.water_sourcedry	1.083*	1.117*	1.019	1.136*	0.861	1.062*	1.051*	1.192*	1.054	1.112*	1.100*	1.082*
	(0.636)	(0.630)	(0.640)	(0.632)	(0.663)	(0.636)	(0.636)	(0.630)	(0.641)	(0.642)	(0.638)	(0.637)
8.water_sourcedry	1.577**	1.596**	1.516**	1.611**	1.583**	1.579**	1.554**	1.649**	1.560**	1.584**	1.621**	1.580**
	(0.691)	(0.690)	(0.694)	(0.692)	(0.729)	(0.693)	(0.696)	(0.693)	(0.700)	(0.698)	(0.686)	(0.692)
land_PC	0.383	0.336	0.412	0.335	0.269	0.342	0.302	0.0361	0.269	0.312	0.330	0.322
	(0.376)	(0.365)	(0.378)	(0.369)	(0.378)	(0.377)	(0.360)	(0.350)	(0.341)	(0.362)	(0.360)	(0.360)
totpresnt_tlu	0.0152	0.0143	0.0160	0.0161	0.0128	0.0136	0.0131	0.0160	-0.00980	0.0158	0.0162	0.0145
	(0.0239)	(0.0237)	(0.0238)	(0.0237)	(0.0236)	(0.0238)	(0.0236)	(0.0237)	(0.0233)	(0.0237)	(0.0237)	(0.0235)
roof_corrug	-0.0537	-0.0397	-0.0535	-0.0522	0.0489	-0.0526	-0.0265	-0.0732	-0.0483	-0.0323	-0.0367	-0.0153
	(0.365)	(0.367)	(0.372)	(0.367)	(0.370)	(0.367)	(0.369)	(0.369)	(0.370)	(0.366)	(0.366)	(0.368)
electcity	-0.0187	-0.101	-0.0304	-0.104	-0.126	-0.0386	-0.0532	-0.108	-0.147	-0.133	-0.0863	-0.0893
	(0.320)	(0.333)	(0.322)	(0.329)	(0.320)	(0.322)	(0.330)	(0.332)	(0.335)	(0.331)	(0.328)	(0.331)
2.pubpipewater	0.164	0.137	0.164	0.121	0.198	0.167	0.149	0.180	0.122	0.124	0.192	0.133
	(0.373)	(0.369)	(0.371)	(0.372)	(0.378)	(0.369)	(0.368)	(0.361)	(0.364)	(0.370)	(0.366)	(0.368)
2.landregcomp	-0.0361	0.000484	0.00996	0.00782	-0.0592	-0.0307	-0.0321	0.0236	-0.00239	0.0165	0.0218	-0.0226
	(0.349)	(0.340)	(0.351)	(0.342)	(0.352)	(0.347)	(0.338)	(0.334)	(0.331)	(0.341)	(0.341)	(0.336)
sav_credit	0.407	0.410	0.405	0.422	0.466	0.398	0.377	0.396	0.505	0.428	0.385	0.393
	(0.353)	(0.353)	(0.355)	(0.354)	(0.359)	(0.355)	(0.355)	(0.347)	(0.349)	(0.347)	(0.358)	(0.352)
2.phoncoverage	-0.936**	-0.921**	-0.935**	-0.923**	-0.889*	-0.902**	-0.912**	-0.843*	-0.971**	-0.951**	-0.860*	-0.908**
	(0.435)	(0.450)	(0.434)	(0.447)	(0.455)	(0.441)	(0.451)	(0.463)	(0.450)	(0.444)	(0.452)	(0.446)
2.DA_office	-0.356	-0.425	-0.423	-0.398	-0.406	-0.359	-0.405	-0.644	-0.567	-0.417	-0.386	-0.421
	(0.526)	(0.531)	(0.526)	(0.529)	(0.537)	(0.529)	(0.528)	(0.555)	(0.524)	(0.529)	(0.522)	(0.527)
2014.year	2.742***	2.749***	2.702***	2.684***	2.736***	2.718***	2.686***	2.697***	2.653***	2.655***	2.776***	2.679***
	(0.498)	(0.500)	(0.498)	(0.497)	(0.508)	(0.499)	(0.496)	(0.499)	(0.486)	(0.496)	(0.498)	(0.492)
2.sexhead	-0.422	-0.481	-0.336	-0.469	-0.321	-0.457	-0.504	-0.471	-0.466	-0.518	-0.463	-0.504
	(0.602)	(0.606)	(0.601)	(0.605)	(0.602)	(0.606)	(0.603)	(0.626)	(0.602)	(0.609)	(0.601)	(0.605)
agehead	-0.0322	-0.0352*	-0.0314	-0.0354*	-0.0278	-0.0325	-0.0332	-0.0381*	-0.0333*	-0.0354*	-0.0349*	-0.0349*
	(0.0200)	(0.0204)	(0.0200)	(0.0204)	(0.0195)	(0.0200)	(0.0202)	(0.0212)	(0.0199)	(0.0206)	(0.0200)	(0.0202)
educhead	0.159**	0.162**	0.169**	0.160**	0.150*	0.160**	0.160**	0.159**	0.167**	0.152*	0.160**	0.159**
	(0.0769)	(0.0782)	(0.0766)	(0.0789)	(0.0793)	(0.0802)	(0.0788)	(0.0795)	(0.0797)	(0.0791)	(0.0771)	(0.0786)
marithead	-0.0295	-0.0502	-0.0197	-0.0447	-0.0898	-0.0231	-0.0486	-0.114	-0.136	-0.0738	-0.0506	-0.0480
	(0.449)	(0.455)	(0.452)	(0.455)	(0.462)	(0.456)	(0.459)	(0.462)	(0.457)	(0.454)	(0.458)	(0.456)
d_market_dist	0.0758	0.0816	0.0755	0.0833*	0.0788	0.0742	0.0760	0.0835	0.0865*	0.0836*	0.0797	0.0789
	(0.0500)	(0.0505)	(0.0499)	(0.0502)	(0.0533)	(0.0515)	(0.0502)	(0.0515)	(0.0509)	(0.0508)	(0.0503)	(0.0503)
p_market_dist	-0.0952	-0.112	-0.0774	-0.113	-0.0727	-0.0801	-0.101	-0.116	-0.111	-0.120	-0.101	-0.106
	(0.0963)	(0.0975)	(0.0996)	(0.0968)	(0.0996)	(0.0978)	(0.0980)	(0.0992)	(0.0981)	(0.0982)	(0.0954)	(0.0971)
vet_dist	-0.0164	-0.0182	-0.0309	-0.0195	-0.0167	-0.0241	-0.0135	-0.0129	-0.0205	-0.0178	-0.0258	-0.0241
	(0.0761)	(0.0758)	(0.0821)	(0.0762)	(0.0794)	(0.0763)	(0.0762)	(0.0752)	(0.0762)	(0.0757)	(0.0744)	(0.0761)
Observations	419	419	419	419	413	419	419	419	419	419	419	419

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A5.2: Youth intended participation in agriculture

		All youth	Male	Female
1	Do you expect to remain active in agriculture in 10 years' time? (%)			
	Yes	59.76	68.03	45.90
	No	40.24	31.97	54.10
	Total	100	100	100
1.1	If yes, do you expect to remain in agriculture in 10 years' time as:			
	Full-time	55.56	63.10	37.14
	Part-time	44.44	36.90	62.86
	Total	100	100	100
2	Do you expect to remain active in agriculture in 20 years' time?			
	Yes	37.97	48.32	20.49
	No	62.03	51.68	79.51
	Total	100	100	100
2.1	If yes, do you expect to remain in agriculture in 20 years' time as			
	Full-time	73.08	75.80	69.44
	Part-time	28.85	24.20	30.56
	Total	100	100	100
3	DO you expect to remain active in agriculture in 30 years' time?			
	Yes	30.41	38.94	15.98
	No	69.59	61.06	84.02
	Total	100	100	100
3.1	If yes, do you expect to remain in agriculture in 30 years' time as			
	Full-time	56.72	75.42	59.26
	Part-time	43.28	24.58	40.74
	Total	100	100	100

Source: survey results

Table A5.3: The effect of relative deprivation on youth occupational choices: results from the multinomial logit models using subjective measures

VARIABLES	Age as a reference group							
	Farming				Non-farm			
	base_noSRD	base_all_age	base_FM_age	base_head_age	base_noSRD	base_all_age	base_FM_age	base_head_age
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Income RD_AGE	-	0.192*	0.145	0.204	-	0.120	-0.0477	129.3
		(0.104)	(0.143)	(0.156)		(0.212)	(0.489)	(64,337)
Social RD_AGE	-	-0.0592	-0.00772	0.0494	-	-0.102	0.596	-115.5
		(0.0931)	(0.137)	(0.140)		(0.179)	(0.439)	(35,901)
logPCI	0.152	-0.0971	-0.274*	-0.161	0.0245	-0.117	1.121**	211.5
	(0.189)	(0.0989)	(0.149)	(0.161)	(0.184)	(0.192)	(0.555)	(64,932)
Female youth	-1.246***	-0.119	-0.182	-0.300	-1.304***	1.042**	0.255	153.2
	(0.470)	(0.233)	(0.327)	(0.367)	(0.455)	(0.487)	(1.021)	(65,803)
Have no mobile phones	0.00191	0.0792	0.0486	-0.147	0.0936	0.00396	0.422	-312.1
	(0.360)	(0.193)	(0.274)	(0.296)	(0.353)	(0.384)	(0.876)	(72,807)
resage	-0.372***	0.429***	0.395***	0.464***	0.0396	0.400***	0.480***	0.249
	(0.0466)	(0.0353)	(0.0591)	(0.0577)	(0.0362)	(0.0487)	(0.124)	(2,928)
edu_youth	0.0917*	-0.322***	-0.356***	-0.576***	-0.230***	-0.0990*	-0.177	32.91
	(0.0553)	(0.0379)	(0.0572)	(0.0741)	(0.0508)	(0.0584)	(0.132)	(11,569)
birthorder	-0.0509	0.0272	-0.0573	0.0187	-0.0229	0.0770	0.0809	39.05
	(0.0750)	(0.0463)	(0.0792)	(0.0747)	(0.0749)	(0.0856)	(0.214)	(21,032)
first_son	-1.130*	0.518*	0.679	0.0215	-0.586	1.152*	1.758	204.7
	(0.585)	(0.303)	(0.415)	(0.476)	(0.557)	(0.607)	(1.182)	(64,653)
2.farm_expri	-0.290	-0.0403	0.0204	-0.112	-0.306	0.377	0.607	-99.69
	(0.362)	(0.194)	(0.282)	(0.302)	(0.352)	(0.375)	(0.845)	(38,403)
Youth_male	0.129	-0.00656	0.0650	-0.0551	0.138	-0.0846	-0.327	-126.9
	(0.215)	(0.102)	(0.137)	(0.155)	(0.213)	(0.223)	(0.486)	(38,203)
Youth_female	-0.00430	-0.0487	-0.00681	-0.0780	-0.110	0.102	0.602	-15.30
	(0.193)	(0.108)	(0.151)	(0.170)	(0.193)	(0.215)	(0.428)	(62,633)
Mature_male	0.128	0.0199	-0.0670	0.0544	0.0728	-0.0110	0.971	114.9
	(0.311)	(0.142)	(0.214)	(0.222)	(0.307)	(0.316)	(0.691)	(49,950)
mature_fem	-0.127	-0.327**	-0.221	-0.272	-0.473	0.0776	0.550	160.6

Childern_tot	(0.313)	(0.150)	(0.211)	(0.207)	(0.304)	(0.317)	(0.715)	(47,619)
	0.253	-0.251***	-0.258**	-0.425**	0.0423	-0.335*	-0.0918	33.88
	(0.169)	(0.0929)	(0.130)	(0.166)	(0.166)	(0.182)	(0.397)	(85,583)
land_PC	-0.176	0.0157	0.0341	-0.00982	-0.0974	0.0704	-0.197	-227.1
	(0.298)	(0.164)	(0.210)	(0.259)	(0.290)	(0.308)	(0.645)	(56,913)
totpresnt_tlu	0.0114	-0.000673	0.00490	0.0212	0.00870	-0.0148	-0.0157	12.84
	(0.0225)	(0.00990)	(0.0135)	(0.0180)	(0.0225)	(0.0245)	(0.0505)	(3,577)
roof_corrug	-0.183	-0.0392	-0.309	0.0773	-0.174	-0.00203	0.218	-573.1
	(0.392)	(0.229)	(0.327)	(0.372)	(0.383)	(0.457)	(1.072)	(259,601)
electcity	0.381	-0.145	-0.221	-1.006	0.344	-0.584	0.161	811.5
	(0.443)	(0.253)	(0.369)	(0.620)	(0.438)	(0.517)	(1.138)	(1.606e+06)
2.pubpipewater	0.987**	-0.121	-0.369	0.179	0.783*	-0.534	-1.669	1,351
	(0.469)	(0.264)	(0.369)	(0.627)	(0.459)	(0.580)	(1.302)	(1.296e+06)
2.landregcomp	-0.398	0.246	0.341	0.0672	-0.305	0.138	1.234	-2,016
	(0.435)	(0.245)	(0.345)	(0.518)	(0.428)	(0.588)	(1.374)	(2.631e+06)
sav_credit	0.531	-0.378	-0.277	-0.300	0.226	-0.541	-1.474	169.4
	(0.413)	(0.234)	(0.327)	(0.466)	(0.404)	(0.454)	(0.954)	(633,453)
2014.year	-0.713	0.119	0.502	-	-0.776*	0.923**	1.503	-
	(0.433)	(0.236)	(0.331)		(0.423)	(0.456)	(1.015)	
wealthindex1	0.0613	0.0371	0.0684	0.00676	-0.217	0.646*	0.662	-207.0
	(0.170)	(0.132)	(0.188)	(0.195)	(0.165)	(0.376)	(0.789)	(119,635)
d_market_dist	0.00144	0.0148	-0.0291	-0.0151	-0.00769	0.0232	0.107	-142.9
	(0.0264)	(0.0190)	(0.0316)	(0.0315)	(0.0260)	(0.0402)	(0.0968)	(95,713)
tele_dist	0.0141	-0.0294*	-0.0238	-0.0306	0.0109	-0.00923	-0.00657	83.14
	(0.0187)	(0.0176)	(0.0236)	(0.0366)	(0.0184)	(0.0338)	(0.0690)	(38,113)
vet_dist	0.00737	0.0446	0.0417	0.0572	0.000645	-0.0172	-0.191	-91.33
	(0.0405)	(0.0304)	(0.0413)	(0.0540)	(0.0398)	(0.0684)	(0.155)	(141,775)
vet_num	-0.978**	0.551**	0.444	0.715	-0.509	0.959*	2.730*	1,151
	(0.384)	(0.280)	(0.446)	(0.449)	(0.371)	(0.549)	(1.601)	(1.414e+06)
agefather			0.00471				-0.114	
			(0.0199)				(0.0732)	
eduather			-0.0810				-0.362*	
			(0.0515)				(0.216)	
maritfather			0.174				2.186	
			(0.445)				(1.840)	
agemother			0.0355				0.155*	
			(0.0276)				(0.0859)	
edumother			0.138*				0.347	
			(0.0783)				(0.220)	
2.sexhead				0.0271				413.7
				(0.376)				(135,756)
agehead				-0.0254**				2,939
				(0.0129)				(1,668)
educhead				-0.0766				-24.61
				(0.0639)				(13,166)
marithead				-0.0229				58.99
				(0.356)				(168,310)
Constant	8.095***	-6.262***	-6.001***	-4.053*	3.887**	-8.877***	-25.57***	-2,003
	(1.902)	(1.202)	(1.863)	(2.211)	(1.830)	(2.343)	(6.632)	(3.389e+06)
Observations	1,162	1,162	529	602	1,162	1,162	529	602

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.

Table A5.4: The effect of relative deprivation on youth livelihood choices: results from the multinomial logit models using objective measures

VARIABLES	Farm employment				Non-farm employment			
	base_noRD	base_all_inIRD	base_FM_inIRD	base_head_inIRD	base_noRD	base_all_inIRD	base_FM_inIRD	base_head_inIRD
Objective measures of RD								
Female youth	-0.175 (0.230)	(0.118) -0.00726 (0.255)	(0.183) 0.138 (0.383)	(0.119) -0.0231 (0.259)	1.061** (0.459)	(0.201) 1.078** (0.486)	(0.468) 0.643 (0.996)	(0.200) 1.085** (0.500)
No mobile phone	0.123 (0.189)	0.306 (0.212)	0.0496 (0.334)	0.298 (0.214)	0.0326 (0.358)	-0.00339 (0.390)	1.251 (0.919)	-0.00264 (0.391)
resage	0.431*** (0.0348)	0.425*** (0.0385)	0.355*** (0.0650)	0.432*** (0.0400)	0.404*** (0.0466)	0.402*** (0.0501)	0.594*** (0.141)	0.413*** (0.0522)
edu_youth	-0.323*** (0.0370)	-0.280*** (0.0394)	-0.280*** (0.0649)	-0.261*** (0.0402)	-0.0893 (0.0561)	-0.0798 (0.0593)	-0.396*** (0.138)	-0.0715 (0.0620)
birthorder	0.0260 (0.0458)	0.0614 (0.0500)	-0.0856 (0.0884)	0.0851 (0.0527)	0.0581 (0.0838)	0.0530 (0.0887)	0.139 (0.226)	0.0704 (0.0915)
first_son	0.400 (0.296)	0.534 (0.333)	0.791 (0.506)	0.581* (0.338)	1.047* (0.562)	0.630 (0.596)	1.541 (1.192)	0.680 (0.602)
2.farm_expri	-0.0733 (0.191)	0.150 (0.248)	-0.0341 (0.399)	0.233 (0.251)	0.420 (0.362)	0.841* (0.440)	0.620 (1.010)	0.874** (0.441)
Youth_male	-0.0483 (0.0989)	-0.862*** (0.141)	-1.129*** (0.212)	-0.838*** (0.142)	-0.0200 (0.198)	0.130 (0.260)	0.282 (0.498)	0.145 (0.262)
Youth_female	-0.0574 (0.106)	-0.944*** (0.149)	-1.351*** (0.241)	-0.946*** (0.149)	0.100 (0.204)	0.0720 (0.247)	0.656 (0.518)	0.0552 (0.247)
Mature_male	0.0493 (0.138)	-0.482*** (0.166)	-0.241 (0.260)	-0.279 (0.189)	-0.0244 (0.297)	0.150 (0.334)	1.438* (0.789)	0.247 (0.371)
mature_fem	-0.306** (0.149)	-0.688*** (0.173)	-0.466* (0.276)	-0.568*** (0.181)	0.0699 (0.305)	0.00680 (0.321)	0.813 (0.718)	0.0610 (0.348)
Childern_tot	-0.258*** (0.0911)	-0.713*** (0.111)	-0.981*** (0.177)	-0.731*** (0.113)	-0.323* (0.171)	-0.352* (0.201)	-0.0549 (0.376)	-0.356* (0.203)
land_PC	-0.116 (0.142)	-0.148 (0.156)	-0.248 (0.211)	-0.104 (0.154)	-0.0160 (0.242)	-0.100 (0.263)	-0.680 (0.745)	-0.0699 (0.263)
totpresnt_tlu	-0.00162 (0.00959)	0.0286** (0.0116)	0.0308* (0.0161)	0.0298** (0.0119)	-0.0144 (0.0227)	-0.0263 (0.0254)	0.00871 (0.0467)	-0.0252 (0.0253)
roof_corrug	-0.0363 (0.224)	-0.0611 (0.253)	-0.634 (0.398)	-0.114 (0.255)	-0.0872 (0.427)	-0.218 (0.452)	0.0183 (1.098)	-0.225 (0.463)
electcity	-0.214 (0.246)	-0.372 (0.276)	-0.395 (0.441)	-0.405 (0.281)	-0.610 (0.491)	-0.610 (0.539)	-0.0796 (1.016)	-0.644 (0.544)
2.landregcomp	0.159 (0.226)	0.129 (0.254)	-0.134 (0.387)		-0.362 (0.475)	-0.653 (0.495)	-0.273 (1.192)	
sav_credit	-0.293 (0.228)	-0.290 (0.250)	-0.0472 (0.383)	-0.286 (0.251)	-0.559 (0.434)	-0.488 (0.464)	-1.635 (1.099)	-0.518 (0.470)
2014_year	-0.0121 (0.212)	0.0433 (0.238)	0.751** (0.362)	0.0746 (0.234)	0.885** (0.414)	1.123** (0.455)	2.587** (1.037)	1.242*** (0.464)
wealthindex1	0.0580 (0.127)	0.129 (0.144)	0.183 (0.232)	0.185 (0.146)	0.603* (0.333)	0.600* (0.354)	0.759 (0.942)	0.620* (0.358)
d_market_dist	0.00858 (0.0183)	0.00363 (0.0204)	-0.0554 (0.0404)	-0.000534 (0.0208)	0.0122 (0.0346)	-0.00855 (0.0382)	0.0476 (0.0691)	-0.0100 (0.0385)
vet_dist	0.0288 (0.0277)	0.0340 (0.0308)	0.0745 (0.0509)	0.0261 (0.0311)	-0.0556 (0.0556)	-0.0609 (0.0574)	-0.304** (0.137)	-0.0677 (0.0578)
vet_num	0.504* (0.258)	0.518* (0.293)	0.874 (0.548)	0.563* (0.298)	0.289 (0.404)	0.462 (0.438)	-0.240 (0.890)	0.523 (0.442)
agefather			0.0293 (0.0238)				-0.0645 (0.0643)	
eduather			-0.0699 (0.0616)				-0.357* (0.183)	
maritfather			-0.0301 (0.538)				-0.0734 (1.574)	
agemother			0.0178 (0.0312)				0.0556 (0.0867)	
edumother			0.201** (0.0895)				0.263 (0.221)	
2.sexhead				0.265 (0.291)				0.185 (0.586)
agehead				-0.0239** (0.00943)				-0.0133 (0.0158)
educhead				-0.0749* (0.0431)				-0.0562 (0.0726)
marithead				-0.0399 (0.260)				0.00483 (0.517)
Constant	-6.015*** (1.069)	62.63*** (7.889)	119.8*** (16.28)	65.40*** (8.096)	-8.903*** (2.042)	14.26 (11.16)	-58.93 (39.91)	14.27 (11.48)
Observations	1,209	1,209	546	1,209	1,209	1,209	546	1,209

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.

Table A5.3: Average marginal effects of covariates on the probability of staying in agriculture in 10 years' time; and OLS estimates of changing occupation

VARIABLES	Remain active in agriculture in 10 years' time (S2)			Transit from part-time to fulltime (S5)			Transit from full-time or part-time to non-farm work (M1-M2)		
	All youth	Controlling for mother and father characteristics	Controlling for head characteristics	All youth	Controlling for mother and father characteristics	Controlling for head characteristics	All youth	Controlling for mother and father characteristics	Controlling for head characteristics
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
position_youth_dum	0.0356 (0.0349)	0.151** (0.0606)	0.0640 (0.0443)	0.0386* (0.0193)	0.0730** (0.0308)	0.0225* (0.0227)	0.015 (0.0192)	-0.0630** (0.0308)	-0.0345 (0.0245)
posi_fath_dum	-	0.130* (0.0667)	-	-	-0.0953*** (0.0334)	-	-	0.0758*** (0.0334)	-
posi_mom_dum	-	-0.0409 (0.0637)	-	-	-0.00896 (0.0332)	-	-	0.03879 (0.0332)	-
posi_head_dum	-	-	0.149*** (0.0470)	-	-	-0.0345 (0.0245)	-	-	0.0253 (0.0252)
2.ressex	-0.148*** (0.0456)	-0.167** (0.0708)	-0.176*** (0.0536)	-0.0798*** (0.0245)	0.0804** (0.0373)	-0.0411 (0.0276)	0.0612** (0.0245)	0.00845 (0.0374)	0.0711** (0.0276)
2.resmobile	0.0479 (0.0371)	0.0807 (0.0675)	0.0318 (0.0483)	0.0232 (0.0202)	-0.0366 (0.0338)	-0.000264 (0.0239)	-0.0234 (0.0202)	0.0372 (0.0338)	-0.000264 (0.0239)
resage	0.0150*** (0.00394)	0.00938 (0.0125)	0.0118 (0.00813)	0.0159*** (0.00210)	0.00759 (0.00542)	0.00916** (0.00390)	-0.0659*** (0.0210)	-0.00754 (0.00542)	-0.00916** (0.00390)
edu_youth	-0.0273*** (0.00534)	-0.0166 (0.0106)	-0.0239*** (0.00749)	-0.0103*** (0.00320)	-0.01624* (0.00526)	-0.00872** (0.00389)	0.0143*** (0.00320)	0.00822* (0.00526)	0.0112** (0.00389)
curr_stud	-0.0406 (0.0438)	0.0355 (0.0823)	-0.0464 (0.0536)	-0.0483* (0.0261)	-0.3854*** (0.0406)	-0.0390 (0.0279)	0.0486* (0.0261)	0.0559 (0.0407)	0.0390 (0.0279)
birthorder	0.00807 (0.00858)	0.0213 (0.0181)	0.0186 (0.0116)	-0.0106** (0.00478)	-0.00366 (0.00881)	-0.00663 (0.00578)	0.00156 (0.00479)	-0.00396 (0.00884)	0.00663 (0.00578)
first_son	-0.00143 (0.0550)	0.0817 (0.0964)	0.0368 (0.0731)	-0.0284 (0.0297)	0.0217 (0.0467)	-0.0176 (0.0370)	0.0527* (0.0296)	0.0154 (0.0465)	0.0176 (0.0370)
2.farm_expri	-0.261*** (0.0564)	-0.0953 (0.0613)	-0.234*** (0.0481)	-0.0797*** (0.0215)	-0.107*** (0.0401)	-0.107*** (0.0267)	0.0492** (0.0206)	0.0492** (0.0206)	0.0251 (0.0348)
agefather	-	-0.0109** (0.00505)	-	-	0.00464** (0.00232)	-	-	-0.00466** (0.00232)	-
edufather	-	-0.00351 (0.00987)	-	-	-0.00631 (0.00501)	-	-	0.00628 (0.00501)	-
maritfather	-	0.0846 (0.142)	-	-	0.0142** (0.0097)	-	-	-0.0153 (0.0597)	-
age_mom	-	0.0103 (0.00653)	-	-	-0.00334 (0.00299)	-	-	0.00340 (0.00299)	-
educ_mom	-	-0.0370** (0.0184)	-	-	0.0129 (0.00891)	-	-	-0.0129 (0.00892)	-
Youth_male	-0.0703** (0.0206)*	0.0188 (0.0329)	-0.0122 (0.0253)	-0.00167 (0.0117)	-0.0139 (0.0161)	0.00935 (0.0127)	0.00177 (0.0117)	0.0143 (0.0161)	-0.00935 (0.0127)
Youth_female	-0.0693 (0.0222)	0.00339 (0.0390)	-0.0201 (0.0275)	-0.00667 (0.0124)	-0.0317* (0.0180)	-0.000495 (0.0133)	0.00679 (0.0124)	0.0317* (0.0180)	-0.000495 (0.0133)
land_PC	0.0287 (0.0356)	0.188** (0.0851)	0.0817 (0.0502)	0.0107 (0.0164)	0.0240 (0.0226)	0.0162 (0.0174)	-0.0106 (0.0164)	-0.0240 (0.0226)	-0.0162 (0.0174)
logPCI	0.0184 (0.0202)	-0.0338 (0.0507)	0.0264 (0.0278)	-0.00402 (0.0114)	-0.0524* (0.0227)	-0.00171 (0.0141)	0.00411 (0.0114)	0.000610 (0.0228)	0.00171 (0.0141)
totpresnt_tlu	-0.0048** (0.00209)	-0.00139 (0.00384)	-0.00671*** (0.00260)	-0.00048 (0.00114)	0.00136 (0.00172)	-0.000880 (0.00122)	0.000448 (0.00114)	-0.00139 (0.00172)	0.000880 (0.00122)
roof_corrug	-0.00908 (0.0401)	-0.138* (0.0796)	-0.0497 (0.0535)	-0.0305 (0.0222)	-0.00331 (0.0387)	-0.0287 (0.0268)	0.0506** (0.0222)	0.00353 (0.0387)	0.0287 (0.0268)
sav_credit	-0.0593 (0.0652)	-0.125 (0.116)	-0.0857 (0.0885)	-0.0139 (0.0359)	-0.00698 (0.0550)	0.0288 (0.0444)	0.0146 (0.0359)	0.00699 (0.0551)	0.0288 (0.0444)
2.sex_head	-	-	0.0359 (0.0521)	-	-	0.0404* (0.0258)	-	-	-0.0504** (0.0258)
age_head	-	-	-0.00315 (0.00226)	-	-	0.000775 (0.00112)	-	-	-0.000775 (0.00112)
edu_head	-	-	-0.00370 (0.00872)	-	-	-0.00154 (0.00437)	-	-	-0.00154 (0.00437)
marit_head	-	-	0.0166 (0.0375)	-	-	0.0265 (0.0182)	-	-	-0.0265 (0.0182)
Constant	-	-	-	0.199* (0.116)	0.164 (0.239)	0.113 (0.153)	0.204* (0.116)	0.832*** (0.240)	0.887*** (0.153)
Observations	638	223	443	621	225	427	621	225	427
R-squared	-	-	-	0.313	0.294	0.209	0.314	0.294	0.209

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: All predictors at their mean values. VIF: full=3.13, non=-2.72, error norm disturb, no heteroscedasticity. We observed also existence of spatial variations (heterogeneity between woredas). For example, youth in Abichugna woreda are more likely to stay in agriculture compared to base woreda-Shirka.

Table A5.4: Effect of RD on the likelihood of changing occupations: results from objective data

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Transition to full-time farming (movers into): agricultural labor entry				Transition into non-farm employment(movers out of): agricultural labor exits			
	age	village	kebele	woreda	age	edu	occup	Occup_age
Income RD	-0.0119 (0.0652) (0.0174)	-0.0203 (0.0615) (0.0165)	-0.0181 (0.0634) (0.0158)	0.0146 (0.0904) (0.0154)	-0.0645* (0.0388) (0.0137)	-0.0690* (0.0382) (0.0136)	-0.0534 (0.0397) (0.0136)	0.103* (0.0560) (0.0150)
2.ressex	0.0204 (0.0353)	0.0198 (0.0354)	0.0214 (0.0355)	0.0182 (0.0338)	0.0292 (0.0277)	0.0310 (0.0277)	0.0322 (0.0278)	-0.0881*** (0.0302)
2.resmobile	0.0232 (0.0296)	0.0222 (0.0296)	0.0229 (0.0296)	0.00818 (0.0283)	-0.0254 (0.0220)	-0.0253 (0.0219)	-0.0244 (0.0220)	0.000256 (0.0241)
resage	0.00368 (0.00442)	0.00413 (0.00442)	0.00429 (0.00436)	0.00268 (0.00415)	-0.0144*** (0.00265)	-0.0139*** (0.00260)	-0.0134*** (0.00258)	0.00310 (0.00288)
edu_youth	-0.00219 (0.00509)	-0.00141 (0.00519)	-0.00218 (0.00511)	-0.00416 (0.00468)	0.0111*** (0.00400)	0.0128*** (0.00417)	0.0107*** (0.00400)	-0.00468 (0.00440)
curr_stud	0.0162 (0.0387)	0.0158 (0.0387)	0.0159 (0.0388)	0.0434 (0.0353)	0.0553** (0.0277)	0.0568** (0.0276)	0.0578** (0.0278)	-0.404*** (0.0305)
birthorder	-0.00116 (0.00674)	-0.00119 (0.00673)	-0.00108 (0.00674)	-0.00124 (0.00642)	-0.00112 (0.00511)	-0.00125 (0.00509)	-0.00121 (0.00510)	-0.00659 (0.00556)
first_son	0.0667 (0.0493)	0.0687 (0.0494)	0.0694 (0.0494)	0.0670 (0.0465)	0.0189 (0.0319)	0.0184 (0.0319)	0.0190 (0.0319)	-0.0144 (0.0350)
2.farm_expri	-0.0937*** (0.0346)	-0.0977*** (0.0348)	-0.0949*** (0.0352)	-0.0950*** (0.0328)	0.0215 (0.0244)	0.0291 (0.0245)	0.0320 (0.0248)	-0.0706*** (0.0267)
Youth_male	-0.0542 (0.0433)	-0.0550 (0.0434)	-0.0552 (0.0434)	-0.0304 (0.0414)	-0.0189 (0.0293)	-0.0192 (0.0293)	-0.0198 (0.0294)	0.0222 (0.0322)
Youth_female	-0.0225 (0.0350)	-0.0219 (0.0348)	-0.0228 (0.0349)	-0.00930 (0.0323)	0.0225 (0.0273)	0.0224 (0.0272)	0.0218 (0.0273)	0.0285 (0.0299)
Male_adult	0.0277 (0.0431)	0.0284 (0.0430)	0.0284 (0.0430)	0.00360 (0.0412)	0.0120 (0.0292)	0.0103 (0.0292)	0.0133 (0.0291)	-0.0286 (0.0316)
Female_adult	0.0149 (0.0328)	0.0137 (0.0329)	0.0145 (0.0330)	0.00766 (0.0308)	-0.0186 (0.0256)	-0.0196 (0.0257)	-0.0165 (0.0257)	-0.0303 (0.0278)
Children_tot	0.0115 (0.0150)	0.0112 (0.0150)	0.0118 (0.0149)	0.00154 (0.0141)	-0.0148 (0.0107)	-0.0154 (0.0107)	-0.0145 (0.0107)	0.0139 (0.0115)
land_PC	-0.0365 (0.0380)	-0.0340 (0.0380)	-0.0355 (0.0380)	-0.0613 (0.0377)	0.00622 (0.0262)	0.00576 (0.0261)	0.00364 (0.0261)	-0.00967 (0.0284)
logPCI	-0.00358 (0.0337)	-0.00782 (0.0336)	-0.00589 (0.0321)	0.00163 (0.0214)	-0.0280 (0.0229)	-0.0324 (0.0234)	-0.0227 (0.0231)	0.0194 (0.0185)
totpresnt_tlu	-0.000217 (0.00156)	-0.000220 (0.00156)	-0.000233 (0.00154)	-0.000212 (0.00147)	-1.45e-05 (0.00133)	1.27e-05 (0.00132)	-0.000139 (0.00132)	-0.000667 (0.00143)
roof_corrug	0.0143 (0.0365)	0.0152 (0.0366)	0.0151 (0.0366)	0.00170 (0.0350)	0.0360 (0.0257)	0.0361 (0.0256)	0.0368 (0.0257)	-0.0106 (0.0282)
electcity	-0.00947 (0.0545)	-0.00933 (0.0545)	-0.00845 (0.0548)	-0.0282 (0.0521)	-0.0548 (0.0412)	-0.0552 (0.0412)	-0.0566 (0.0413)	0.0218 (0.0453)
2.youthprojec	-0.0761 (0.0605)	-0.0794 (0.0606)	-0.0784 (0.0606)	-0.0353 (0.0581)	-0.00390 (0.0404)	-0.00186 (0.0405)	-0.000258 (0.0407)	-0.0749* (0.0445)
sav_credit	0.0152 (0.0622)	0.0131 (0.0623)	0.0129 (0.0623)	0.0110 (0.0598)	0.00129 (0.0429)	-0.000475 (0.0428)	-0.00134 (0.0428)	0.0465 (0.0477)
wealthindex1	-0.00581 (0.0344)	-0.00617 (0.0344)	-0.00557 (0.0345)	0.00682 (0.0337)	0.0320 (0.0225)	0.0319 (0.0225)	0.0334 (0.0226)	-0.00628 (0.0246)
2.sexhead	0.160*** (0.0561)	0.161*** (0.0561)	0.160*** (0.0561)	0.106** (0.0533)	-0.0276 (0.0347)	-0.0289 (0.0347)	-0.0308 (0.0348)	0.0448 (0.0379)
agehead	0.00222 (0.00135)	0.00223 (0.00135)	0.00221 (0.00135)	0.00241* (0.00130)	0.000400 (0.000977)	0.000439 (0.000977)	0.000380 (0.000977)	0.00129 (0.00108)
educhead	0.00826 (0.00534)	0.00849 (0.00534)	0.00828 (0.00534)	0.00897* (0.00501)	-0.00468 (0.00432)	-0.00439 (0.00433)	-0.00481 (0.00432)	0.00272 (0.00473)
marithead	0.0908** (0.0432)	0.0908** (0.0431)	0.0907** (0.0432)	0.0740* (0.0403)	-0.0207 (0.0317)	-0.0194 (0.0316)	-0.0199 (0.0317)	0.0399 (0.0347)
d_market_dist	0.00537* (0.00301)	0.00543* (0.00301)	0.00539* (0.00301)	0.00499* (0.00291)	0.000628 (0.00216)	0.000694 (0.00216)	0.000542 (0.00216)	0.00156 (0.00236)
tele_dist	-0.00411 (0.00271)	-0.00423 (0.00272)	-0.00406 (0.00271)	-0.00377 (0.00257)	0.000387 (0.00178)	0.000366 (0.00179)	0.000469 (0.00178)	-0.00275 (0.00197)
p_market_dist	-0.0111 (0.00740)	-0.0113 (0.00739)	-0.0114 (0.00742)	-0.00795 (0.00712)	-0.00602 (0.00487)	-0.00603 (0.00486)	-0.00588 (0.00488)	-0.000626 (0.00540)
vet_dist	0.00890* (0.00497)	0.00906* (0.00498)	0.00890* (0.00497)	0.00758 (0.00469)	0.00473 (0.00367)	0.00503 (0.00367)	0.00493 (0.00368)	0.00149 (0.00404)
vet_num	0.0226 (0.0489)	0.0238 (0.0489)	0.0231 (0.0491)	0.0204 (0.0476)	0.0374 (0.0359)	0.0394 (0.0359)	0.0369 (0.0360)	0.0118 (0.0395)
Constant	0.236 (0.371)	0.266 (0.361)	0.246 (0.346)	0.207 (0.246)	1.109*** (0.250)	1.130*** (0.244)	1.043*** (0.245)	0.710*** (0.203)
Observations	272	272	272	286	509	509	509	501
R-squared	0.220	0.219	0.218	0.219	0.333	0.334	0.332	0.548

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.