Intergenerational Mobility in Income and Economic Status in Ethiopia

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Abstract

Using data from two comprehensive national Labour Force Surveys and monetary and non-monetary outcomes, we examine the extent of intergenerational mobility in Ethiopia. Results from OLS and Quantile regression suggest moderate to high levels of earnings persistence. Generalised Ordered Logit based results suggest significant mobility educationally, which may be linked to the significant widening of educational opportunities over the last two decades; but hardly any evidence of mobility occupationally. Sons are found to be relatively more mobile than daughters in all cases. Public policy may have to foster the equality of opportunities generally and along gender lines to enhance mobility.

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1. Introduction

Intergenerational mobility examines "the relationship between the socio-economic status of parents and the socio-economic outcomes of their children as adults" (Blanden, 2013, p.38). Mobility is said to happen when children "occupy different positions in their generation's distribution of economic status than did their parents in their generation's distribution" (Dearden *et al*. 1997, p.47). The question of how family background influences children's lifetime economic status has been a subject of considerable research interest since the seminal work of Becker and Tomes (1986).[1] The central hypothesis of this literature lies on parental altruism towards the welfare of children and investments in children's human capital, which shape children's fortunes beyond the heredity of cognitive ability and other genetic traits.

The level of intergenerational mobility in a society is thought to reflect the degree of equality in economic opportunities in the society. As Blanden (2013) notes, however, it is inevitable that the socio-economic outcomes of children are influenced by their parents. To the extent that this is the case it is hard to imagine the elimination of inequality altogether. However, the rate of inequality is generally much higher in low-income countries (UNDP 2013). There is also a large body of theoretical and empirical evidence suggesting that inequality in socio-economic status hinders economic development (see, for example, Corak 2013; Blinder and Woodruff 2002). Public policy may therefore play a useful role in reducing inequality particularly in the context of low income countries. Understanding the drivers of inequality in socio-economic outcomes and the link between successive generations in this respect may therefore be vital in addressing issues of inequality. This paper aims to shed some light on intergenerational mobility in socio-economic status in Ethiopia and investigates the extent to which inequities are transmitted across generations.

The economics literature on intergenerational mobility relies on monetary (earnings and/or income) measures of mobility. This is because monetary measures provide simple

[1] Some of the recent studies include Black *et al*. (2015), Blandan and Macmillan (2014), Corak (2013), Black and Devereux (2010), Aaronson and Mazumder (2008), Currie (2008), Jenkins and Siedler (2007), Ferreira and Veloso (2006), Blandan (2005), Dustmann (2005), Nguyen *et al*. (2005).

metric that allows examining mobility through correlations in these measures between successive generations. The bulk of the literature here relies on mobility as measured by correlations between the earnings of sons and their fathers. In other words, much of the literature has ruled out non-labour income and excluded those without paid employment (Blandan 2013).[2] Non-monetary measures of socio-economic status such as occupational status and educational attainment constitute alternative measures in examining mobility, which sociologists have used extensively (Erikson and Goldthorpe 1992; Carmichael 2000; Johnson, 2002; Erikson and Goldthorpe 2002; Breen and Jonsson 2005; Goldthorpe and Jackson 2007; Erikson and Goldthorpe 2010). The non-monetary approach of measuring intergenerational mobility may even offer a broader account of mobility as it depicts mobility in both economic and social status. Examining mobility using both the monetary and non-monetary approaches may therefore provide a more comprehensive picture of intergenerational transmission in socio-economic status. Goldberger (1989) emphasised that exclusive focus on monetary measures such as income or earnings may severely underestimate the effect of family background on inequality. On the other hand, focusing entirely on non-monetary measures runs the potential risk of misclassification and biased estimates of intergenerational mobility.

Taking these issues into account, this paper combines the monetary and non-monetary approaches to examine the level of intergenerational mobility in earnings and economic status among a sample of young adults between 25 and 35 years of age (children hereinafter) and their father in Ethiopia. To this end, the paper uses data from two comprehensive nationally representative labour force surveys conducted in 2005 and 2013. It also examines if systematic differences in mobility exists between sons and daughters. Due to the challenges posed by the labour market histories of women, which are often interrupted for family and child care reasons, most previous studies have focused almost exclusively on the intergenerational linkages between fathers and sons.[3] This paper follows

[2] In part this explains why women are excluded from much of the literature on intergenerational mobility. For example, Erikson and Goldthorpe (1992) argue that even though participation of women has increased more recently, their labour market history, which is marked by interruptions, makes it hard to use their earnings to study intergenerational mobility in the income/earnings sense.

[3] Hotchkiss and Pitts (2007), Phipps *et al*. (2001), Blau and Kahn (2000) dwell on such interruptions rigorously. In the low income country context considered here, the expectation is that interruptions of this nature are likely to

broadly the same approach by focusing on the link with fathers only; but on the children side, it considers both sons and daughters.

Although there has been extensive research on intergenerational mobility in economic status, the focus of much of the literature has been on advanced economies.[4] In the context of Sub-Saharan Africa, there is virtually no evidence on intergenerational mobility to date. This paper thus has the potential to provide important insights into intergenerational mobility generally and potential differences between sons and daughters in mobility in the context of a low income country, which may be of considerable interest for researchers and policy makers alike. The paper is organized as follows. Section 2 describes the LFS data used, providing some background information on earnings levels as well as the educational and occupational statuses of children and their father. Section 3 previews the analytical framework used to estimate intergenerational mobility in earnings, educational attainment and occupational status. Section 4 discusses the results of the statistical analysis and section 5 concludes the paper highlighting some of the challenges in conducting a similar study in the context of low income countries.

2. Data and variables

The data come from the 2005 and 2013 Labour Force Surveys of Ethiopia. The surveys constitute the most recent two sweeps of the three nationally representative and comprehensive household surveys collected by the Central Statistical Agency (CSA) of Ethiopia, which began in 1999.[5] The surveys gather extensive labour market information with the aim of monitoring the economic and social situation of the economically active population in the country. As detailed in Kolev and Robles (2010) the surveys gathered extensive individual-level information on demographic, human capital and labour market

have far more serious repercussions given weak labour market institutions, which may entail longer or permanent interruptions. Importantly, this compounds the measurement error problems for mothers' income.

[4] Some of the exceptions to this are: Piraino (2015), Brunori *et al*. (2013) and Thomas (1996) on South Africa; Gong *et al*. (2012) on China; Ferreira *et al*. (2011) on Turkey; Ferreira and Gignoux (2011) on Latin America; Ferreira and Veloso (2006) and Dunn (2007) on Brazil, Blinder and Woodruff (2002) on Mexico and Nunez and Miranda (2010) on Chile.

[5] http://www.csa.gov.et/. The 1999 LFS did not gather data on earnings however, which is the reason for excluding data from the survey.

characteristics of individuals in surveyed households as well as some household-level characteristics such as household composition and the relationship of each household member to the household head, among others.

The 2005 and 2013 LFSs monitored 230,680 and 240,660 individuals nationally, respectively. Of these, 114,827 and 120,709 individuals were children of the household head and/or their spouse. Several steps were taken in setting up the data for analysis. *First*, the child-father pairs were identified based on responses given to the question "what is your relationship to the head of the household?" If a household member is identified as a man and is reported to be the "*head or spouse*", then they are regarded as the father.[6] *Secondly*, all household members who are identified as "*son or daughter*" of the household head are regarded as the head's and their spouse's children. *Thirdly*, the surveys monitored respondents' "*highest grade completed*", "*employment status*" and, for those in employment, "*what was your main occupation*" and "*the amount of total pay from their main occupation last month*". Responses to these questions provided the three key outcome measures on "*earnings*", "*occupation*" and "*highest level of education attained*", which are examined using the analytical approaches detailed in the next section. *Fourthly*, the relevant information for fathers is copied across to all children between 25 and 35 years of age within each household surveyed. Finally, only children with valid information on the key outcome and control variables were retained. This yielded 5,493 and 7,759 children in 2005 and 2013, respectively, which form the basis for part of the analysis conducted examining intergenerational mobility in terms of the non-monetary outcomes discussed. The top panel of Table A1 in the Appendix provides descriptive statistics on demographic, educational, occupational, household, parental and regional characteristics of these samples. Mobility in terms of our monetary measure (earnings) is examined using a reduced sub-sample of 397 and 789 children in 2005 and 2013. The significant reduction is due to missing earnings information, particularly for fathers. The bottom panel of Table

[6] The father-child cohorts are identified from the question(s) that specifically monitor relationships within the household. The relevant question in the questionnaire is: "*What is your relationship to the head of the household*?" If the respondent answered '*head or spouse*' and is male, they would be regarded as father. On the other hand, if they responded as '*son or daughter of the head/spouse*', then they would be regarded as the head's/spouse's children as they should be. The economic reality in terms of property ownership/rental in Ethiopia has been such that young adult children would be more likely to remain with their parents well into their adult life.

A1 provides descriptive statistics on the earnings information of children and their father for the sub-set of the retained sample. The earnings information, which has been symmetrically winsorized at 2%, was deflated using Consumer Price Index (CPI) to facilitate comparability of between the 2005 and 2013 child-father cohorts.[7]

3. Analytical framework

The paper adopts two main empirical strategies to examine intergenerational mobility in socio-economic status.

3.1 *Intergenerational Earnings Mobility*

The measurement of intergenerational earnings mobility centres on the relationship between parents' permanent income and their child's permanent income (Blanden 2013; Corak 2013; Black and Devereux 2011; Bowles and Gintis 2002; Osterberg 2000). Often the analysis involves regressing the log of children's permanent income on the log of their father's permanent income using OLS.[8] However, "permanent" income is usually unobserved particularly for parents. Instead, the bulk of the literature relies on some transitory earnings measure in one or several periods. In this paper we use transitory earnings information from two child-father cohorts drawn from the 2005 and 2013 sweeps of the LFS. The simplest log-linear earnings equation estimated has the following form:

$$y_{i,j}^{c} = \alpha_i^{\,c} + \beta y_j^{f} + \varepsilon_i^{c} \quad (1)$$

[7] Symmetric winsorization has been chosen instead of trimming to minimise loss in observations on father-child pairs with valid earnings information. See Lien and Balakrishnan (2005) for details on trimming versus winsorization. The Table shows a much reduced sample size of father-child pairs with valid information on earnings. Mothers are excluded from the analysis since most women of the older/mother's generation (i.e. going back more than 40 years (given that children would have to be at least 25 years old to be in our sample) would hardly be engaged in employment activities then given the local realities in the pre-liberalisation period (pre-1991) in Ethiopia, with little scope to explore mobility between mothers and children particularly in income terms. Post-1991, there has been significant opening up and, particularly in the last two decades, a reported double-digit growth rate, which is likely to open up employment opportunities for daughters.

[8] The typical model estimated takes the form $y_i^c = \alpha_i + \beta y_i^p + \varepsilon_i$ or $y_{i,t} = \alpha_i + \beta y_{i,t-1} + \varepsilon_i$ where y stands for 'permanent' income and superscripts (subscripts) c and p (t and t-1) represent children and their parents, respectively, in household i (see Corak and Heisz 1999, Black and Deverux 2011 for example).

where, y stands for actual reported earnings; superscripts *c* and *f* index children and their father, respectively; *i* and *j* index children and households.[9] The estimated coefficient β yields the elasticity of children's earnings with respect to their fathers' earnings, which summarises the proportion of each 1% difference in parental earnings between families that gets translated into earnings difference between their children or the degree of child-father earnings persistence.[10] The two extreme values for the elasticity are: $\beta = 0$, which signifies complete intergenerational mobility with no correlation between children's and parents' earnings, and $\beta = 1$, which suggests complete intergenerational immobility where, children's earnings are determined fully by their parents'. Typically, estimates of β lie between these extreme values.

Equation (1) summarises average relationships based on the conditional mean function [E($y \mid \boldsymbol{x}$)] and does not as such handle possible nonlinearities in the earnings of children and their father. However, it is shown that accounting for nonlinearity can be vital in the measurement of intergenerational earnings mobility, particularly in the context of cross-country comparisons (see, for example, Bratsberg *et al*. 2007). Taking this into account, this paper explores whether earnings nonlinearities are important to consider in addition. To this end; *first*, categorical variables have been generated from the raw data, with five categories corresponding to the earnings quantiles of fathers and children.[11] Cross-tabulating the resulting categorical variables gives a [5×5] transition matrix, which is used to compute the following: (*i*) the proportion of all children with earnings quantiles *below* the earnings quantiles of their father (i.e., the sum of the proportions below the main diagonal of the transition matrix), (*ii*) the proportion of all children with earnings quantiles same as the earnings quantiles of their father (i.e., the sum of proportions on the main diagonal) and (*iii*) the proportion of all children with earnings quantiles *above* the earnings

[9] In the context of developing countries in particular, there is a real possibility that there are more than one children per household, which the empirical analysis carried out in this paper takes into account.

[10] In other words, (1 – β) represents the degree of intergenerational mobility. If $y_{i,j}^{c}$ and y_{j}^{p} are measured in logarithms, the coefficient β corresponds to the elasticity of the child's income with respect to the parents' income. In case of equal variances across generations, β represents the intergenerational correlation coefficient. In case of differing variances, the correlation coefficient can be estimated as $\rho = \beta(\sigma_{j}^{p} / \sigma_{i,j}^{c})$ (Osterberg 2000, Bowles and Gintis 2002, Black and Devereux 2011, Blanden 22013).

[11] The categorical quantile markers are generated from the continuous monthly earnings information of fathers and children using STATA's "xtile" command.

quantiles of their parent (i.e. the sum of the proportions above the main diagonal). These proportions and potential differences between sons and daughters are examined to gain some insight into the child-father earnings patterns from the raw data.

Secondly, the paper also implements quantile regression. As argued in Eide and Showalter (1999), this approach takes into account the possibility that the child-father earnings link varies at different points of the conditional earnings distribution rather than just at the mean as equation (1) assumes. Suppose that $Q_\theta(y^c_{i,j} \mid y^f_j)$ denotes the θ^{th} quantile of child *i*'s earnings conditional on their father's in a family *j*. The θ^{th} quantile of the conditional distribution of $y^c_{i,j}$ given y^f_j is then defined as $Q_\theta(y^c_{i,j} \mid y^f_j) = \beta(\theta) y^f_j$, $\theta \in (0,1)$. Parameter estimates, which may vary across quantiles, are obtained from the minimisation of the following objective function (Koenker and Bassett 1978; Buchinsky 1998):

$$(2) \qquad \underset{\beta_\theta \in R^k}{Min}\, Q(\beta_\theta) = \sum_{i \in \left\{i: y^c_{i,j} \geq \beta_\theta y^f_j\right\}} \theta \mid y^c_{i,j} - \beta_\theta y^f_j \mid + \sum_{i \in \left\{i: y^c_{i,j} < \beta_\theta y^f_j\right\}} (1-\theta) \mid y^c_{i,j} - \beta_\theta y^f_j \mid$$

where, $y^c_{i,j}$ and y^f_j are as defined earlier and β_θ is estimated coefficient associated with quantile θ.[12] We use this minimisation to estimate quantile-specific earnings elasticities.

3.2 Intergenerational Mobility in Socio-Economic Status

To examine intergenerational mobility in non-monetary economic status, the paper follows Goldberger (1989) and Nguyen *et al*. (2005), which compare the occupational and educational status of children and their parents. Non-monetary indicators of economic status are likely to be less noisy measures of long-term economic status than earnings since they are less sensitive to transitory shocks (Nickell, 1982; Ermisch and Francesconi, 2002).

[12] Equation (2) shows that the minimization problem attaches asymmetric penalties of $(1-\theta)$ and θ for overprediction and underprediction, respectively, and is solved using linear programming methods (Buchinsky, 1998).

Also, measurement errors are less concerning in educational and occupational status than in monetary measures (Black and Devereux 2011). Moreover, educational attainment and occupational status are highly correlated with earnings (Blandan 2013; Johnson, 2002; Nickell, 1982). Nonmonetary measures of mobility are thus likely to provide suitable complementarity to the monetary measure. Given this, the paper uses educational and occupational status of children and their fathers to study intergenerational mobility in non-monetary outcomes.

The child-father educational attainment rankings have the following four categories: (*i*) no education or can't read and write ($y = 0$); (*ii*) grades 1 to 6 ($y = 1$); (*iii*) grades 7 to 10 ($y = 2$), and (*iv*) grade 11 and higher ($y = 3$). The child-father occupational status rankings, on the other hand, have the following six categories: (*i*) no/elementary occupation ($y = 0$); (*ii*) skilled agriculture and forestry ($y = 1$); (*iii*) services and sales ($y = 2$); (*iv*) machine operator and crafts ($y = 3$); (*v*) managerial and professional ($y = 4$). Each of these two nonmonetary status indicators is used in two main ways. *First*, the child-father educational and occupational status indicators were cross-tabulated to get a [4×4] educational status matrix and a [5×5] occupational status matrix, respectively. These matrices were then used to compute the following: (*i*) the proportion of sons and daughters with lower level of educational attainment (or occupational status) than their father's; (*ii*) the proportion of sons and daughters with the same level of educational attainment (or occupational status) as their father's, and (*iii*) the proportion of sons and daughters with higher level of educational attainment (or occupational status) than their father's. These proportions and potential differences between sons and daughters are then examined to get some preliminary insights into the raw patterns of the child-father educational and occupational statuses.

Secondly, the ordinal outcome measures on educational and occupational status are modelled using Generalised Ordered Logit (GOLogit) model to examine the child-father link in educational and occupational status. GOLogit fits less restrictive models without the need for invoking the often violated parallel-lines assumption of the ordered logit model (see, Williams, 2006). It is also "…more parsimonious and interpretable than those fitted by a nonordinal method, such as multinomial logistic regression" (p. 58). The model based

analysis allow controlling for other factors such as household size and composition, which are important in determining intergenerational mobility. For example, a two-parent family may have more resources and may, consequently, be in a better position to invest more in their children's education than a single parent family. Also, it may be vital that the child quality-quantity trade-off (Becker 1991; Hanusheck 1992) is taken into account. Large family/sibling size may mean scarcer resources, particularly where siblings are not fully engaged economically, thereby affecting the educational and occupational status of children adversely.

The GOLogit model used to examine intergenerational mobility in non-monetary economic status has the following general form:

$$P(Y_i > j) = g(\mathbf{X}\beta_j) = \frac{\exp(\alpha_j + \mathbf{X}_i\beta_j)}{1 + \{\exp(\alpha_j + \mathbf{X}_i\beta_j)\}}, j = 1,2,...,M-1 \quad (3)$$

where, M represents the number of categories of the ordinal outcome measures of educational and occupational statuses of children, which are estimated separately, and where the vector ***X*** includes the corresponding educational and occupational statuses of fathers as well as other child and household characteristics. The estimation is performed in STATA using the 'gologit2' programme (Williams 2006).

4. Results and discussion

4.1 Intergenerational mobility in earnings

Table 1 reports summary statistics describing the patterns of child-father earnings distributions from the raw data, using cross-tabulations of the categorical variables described earlier, which represent earnings quantiles. Accordingly, more than 50% of the children are found to be in higher earnings quantiles than their fathers' while 28.4% (19.2%) of the children reported to be earning in the same (lower) quantile as (than) their fathers'. Comparison of the 2005 and 2013 child-father cohorts shows that the proportion of children in higher earnings quantiles than their fathers' has increased to 58% from its 2005 level (41%). On the other hand, the proportion of children who reported to be earning

in the same (lower) earnings quantiles declined by 10 (7) percentage points in 2013. The gender differentials in the child-father earnings distribution reveal that compared with sons daughters are significantly less (more) likely to be in higher (lower) earnings quantiles than their fathers'.

[Table 1 – about here]

Table 2 reports results from OLS and Quantile regressions. The first column reports results from OLS while the remaining columns report results from quantile regressions. The OLS results for the combined samples of sons and daughters indicate that the estimated earnings elasticity is 0.46 in 2005 and 0.38 in 2013. That is, the level of fathers' earnings that got transmitted to children's earnings amount to 46% and 38% in 2005 and 2013, respectively. This suggests an increase in earnings mobility in Ethiopia more recently. The elasticities from the quantile regressions reveal that the OLS estimates mask some variations in mobility across the earnings quantiles. In particular, the results for the combined sample reveal that there is a moderately high earnings persistence of between 50.4% and 55.4% in the lower two and the median quantiles in 2005. For the top two quantiles, on the other hand, a markedly lower earnings persistence has been found. This suggests a relatively high level of earnings mobility at the top end of the earnings distributions. Although lower in magnitude, the same overall pattern emerges for 2013, as can be gleaned from the estimated quantile elasticities. Figure 1 depicts plots of the estimated elasticities from OLS and quantile regressions for 2005 and 2013 for the combined sample.

[Figure 1 – about here]

The gender differential in the estimated earnings elasticities is also noteworthy. Results from OLS indicate that sons were significantly more mobile than daughters with earnings elasticities of 0.39 (2005) and 0.37 (2013) against daughter's earnings elasticities of 0.59 (2005) and 0.50 (2013). Thus, once again, sons are relatively more mobile than

daughters in the earnings sense. Quantile regression estimates from the gender-based sub-group analysis also show some variability in mobility patterns of sons and daughters across the earnings quantiles. Specifically, daughters, with estimated elasticities in 2005 that range between 0.52 and 0.72, are found to have a high degree of earnings persistence than sons, particularly at the top earnings quantiles. On the other hand, sons are found to have a higher (than daughters') level of earnings persistence at the lowest earnings quantile with an estimated elasticity of 0.53 in 2005. More or less similar picture emerges in 2013, where estimated elasticities for daughters' top quantiles are relatively lower but the estimated elasticity for sons' lowest quantile has increased. The literature hardly deals with the intergenerational mobility of daughters. One of the few exceptions to this, Chadwick and Solon (2002) who use family (parents') income, find daughters to be more mobile than sons. Figure 2 depicts the mobility patterns of sons and daughters in 2005 and 2013 based on the earnings elasticities obtained from OLS and Quantile regressions.

[Figure 2 – about here]

Overall, the estimated earnings elasticities in this paper vary between 0.37 and 0.72 depending on the child-father cohort (i.e. 2005 or 2013) and/or the earnings level/quantile considered, suggesting moderate to high levels of earnings stickiness in Ethiopia, particularly for daughters. These findings are broadly consistent with some of the evidence in the literature relating to emerging economies, the closest available comparator for this study, where estimated elasticities stand at 0.60 for South Africa and Brazil, 0.63 for China and 0.57 – 0.74 for Chile (see Piraino 2015; Gong et al. 2012; Nunez and Miranda 2010; Dunn 2007; Ferreira and Veloso 2006). In comparison, estimated elasticities are generally found to be the lowest (0.10-0.15) for the more egalitarian Nordic welfare-state economies such as Denmark, Finland and Norway; and moderately high (about 0.50) for advanced market economies such as the US and the UK (see, for example, Bjorklund and Jantti 1997, 2000; Solon 2002; Bratsberg *et al*. 2007). The findings also suggest a moderate decline in stickiness (or moderate increase in mobility) between the 2005 and 2013 cohorts, more so for daughters than sons as the gender-based sub-group analysis reveals. The observed

decline in stickiness between 2005 and 2013 may be attributed to two recent developments in Ethiopia. First, Ethiopia is reported to have recorded rapid economic growth since 2005, which is driven by extensive public infrastructure investment (WB 2016, 2014). The public infrastructure investment, which is labour intensive in nature, must have contributed to some improvements in a significant increase in employment thereby changing improving enhancing mobility. Second, the country has also had a new and booming export oriented 'cut flower' industry over the last decade (WB 2014). This sector is also labour intensive in nature and has boosted particularly female employment, something that must have contributed to the improved intergenerational earnings mobility. Third, the country has also rapidly expanded tertiary-level education since 2005 in particular (Alemu 2010; Tessema 2009). Reported poor quality of education and graduate unemployment aside, the expansion in educational opportunities is likely to have contributed to the moderate improvement in intergenerational mobility observed more recently.

[Table 2 – about here]

4.2 Intergenerational mobility in educational and occupational status

4.2.1 Educational status

Table 3 reports summary statistics on the distributions of child-father educational status. The combined 2005 and 2013 sample reveals that 63% of children have achieved a higher level of educational attainment than their fathers', while only 6% have done worse. The balance represents those children attaining the same level of education as their fathers'. There is a statistically significant gap in intergenerational educational attainment between sons and daughters, in favour of the former. Thus, compared with daughters, sons are 9 percentage points more likely to attain higher levels of education and 4 percentage points less likely to do worse than their fathers'. Splitting the sample by survey year provides more or less similar picture in terms of the child-father attainment patterns. This includes the gender differences in attainment between 2005 and 2013. Accordingly, sons were 20.1 (12.9) percentage points more (less) likely to do better (worse) educationally than their

father in 2005 vis-à-vis, while in 2013 they were 19.8 (13.8) percentage points more (less) likely to do better (worse) than their father.

[Table 3 – about here]

Table 4 reports marginal effects from the GOLogit models estimating transition probabilities in educational status.[13] The results reveal that compared with children with fathers without education, sons & daughters with fathers with some level of education are generally significantly more (less) likely to attain higher (lower) levels of education than their fathers'. Thus, for example, in 2005 children with fathers who attained 'grade 1 to 6' are 26 percentage points more likely to excel their fathers reaching the highest grade ('grade 11 and higher') attainable in the data, while those with fathers who attained 'grade 7-10' are 41 percentage point more likely to attain the highest grade. Similarly, children with fathers who attained the highest grade are 52 percentage points more likely to attain the same level qualification as their fathers'. The highest grade category covers a broad range of educational grades, however, which had to be grouped together due to data thinning. Given that, attaining the same category of education may well mean that children excel their fathers' educational achievement even in this case, including attaining tertiary level education. The estimated marginal effects also suggest that the pattern of educational mobility observed remained broadly the same in 2013, where children with fathers with some level of education are found to be generally significantly more (less) likely to attain a higher (lower) level of education than their fathers'. There are some gender disparities in educational mobility, however, particularly when it comes to the highest grade attainable, which sons are more likely to attain than daughters by some 5 percentage points. This finding is consistent with the evidence elsewhere that the rapid expansion in tertiary education in the country predominantly favours men than women (Reisberg and Rumbley 2010)

[13] The full lists of marginal effects corresponding to each panel of Tables 4 and 6 are provided as Appendix Tables A2 – A7 and A8 – A13, respectively.

[Table 4 – about here]

4.2.2 Occupational status

Table 5 reports summary statistics on the distributions of child-father occupational status. The combined 2005 and 2013 sample reveals that occupationally children are spread more or less equally among the three possible states of having better, same or lower occupational status than their fathers'. The Table also reports a statistically significant gender gap in occupational mobility. Accordingly, compared with daughters, sons are 9.1 (4) percentage point more (less) likely to occupy higher (lower) occupational status than their fathers'. Splitting the sample by survey year reveals that the proportions of children occupying each of the three possible states changed only marginally between 2005 and 2013, suggesting little or no improvement in occupational mobility between the two periods. Gender wise, barely any significant gender gap was found in child-father occupational status in 2005 while a significant gender gap was found in 2013, where compared with daughters, sons are found to be 5.7 (6) percentage points more (less) likely to occupy higher (lower) occupational status than their fathers'. This appears to suggest whatever little improvement in occupational mobility that existed was weighted more by improvements in the occupational fortunes of sons.

[Table 5 – about here]

Table 6 reports marginal effects from the GOLogit models estimating intergenerational mobility in occupational status. The results reveal that fathers' occupational status by far the best predictors of children's occupational status across all the specifications estimated. This suggests little or no mobility in terms of occupational status. For example, in 2005 children with fathers in "managerial and professional" occupations are 6 percentage points (5 percentage points) more (less) likely to have a "managerial and professional" (lower) occupational status, compared with the base category of children with fathers with "no or elementary" occupational status. A similar picture emerges for 2013, but with marginal effects that are relatively higher in magnitude than those for 2005. In

other words, these results suggest a lack of mobility occupationally in the sense that children with fathers in lower occupational levels find it harder to excel their fathers occupationally. These results also appears to reinforce the moderate to high level of earnings stickiness reported earlier. Gender wise, the marginal effects computed reveal limited gender differential in occupational mobility in that the marginal effects are generally higher in magnitude for sons than daughters. For example, sons (daughters) with fathers in "managerial and professional" occupations are 7 percentage points (5 percentage points) more likely to have the same occupational status as their fathers' in 2005. In contrast, sons (daughters) with a similar paternal occupation status are found to be 21 percentage points (12 percentage points) more likely to have the same occupational status as their fathers' in 2013.

[Table 6 – about here]

5. Summary and conclusion

The paper examined the extent of intergenerational mobility in monetary and non-monetary economic status in Ethiopia. There is virtually no evidence on intergenerational mobility in the context of low income countries in general and Sub-Saharan Africa in particular. It is widely accepted that inequality in socio-economic status limits economic development. If so, it is vital that we begin to examine the extent of intergenerational mobility in the context of low income countries, a task this paper sought to accomplish. The paper used data from two recent and comprehensive national Labour Force Surveys in Ethiopia, which were conducted in 2005 and 2013. Two cohorts of young adults (males and females) between the ages of 25-35 and their fathers in surveyed households have been used for the purpose of the empirical analysis conducted.

The results obtained suggest that there is generally moderate to high level of earnings persistence between the generations considered in Ethiopia. This finding is broadly consistent with findings from similar studies on emerging economies, where high level of inequality is thought to lead to low levels of intergenerational mobility. The paper

also finds some gender disparity in mobility, with sons having a higher degree of mobility than daughters in earnings terms. A moderate increase in mobility has also been found between 2005 and 2013, which appears to be concentrated at the median and lower quantiles of the earnings distributions. The improvement in mobility might have been driven by the reported significant increase in economic growth in Ethiopia over the last decade and half, which is fuelled by extensive public sector investment in infrastructure and the emergence of new export oriented sectors such as the cut flower industry. Comparing sons and daughters in the two child-father cohorts studied, the latter appeared to have gained some ground in earnings mobility terms more recently. This gain, which appears to be across the earnings quantiles, is likely to have contributed to a reduction in the gender gap in intergenerational earnings mobility in Ethiopia. As well as the boom in public sector investment and the rapid expansion in the cut flower industry noted earlier, which are both labour intensive in nature and the latter predominantly employs women, the significant widening of secondary- and tertiary-level education in the country over the past two decades might also have contributed to the relative improvement in the mobility picture more recently. Still, the message coming out of this exercise is fairly clear in terms of the need for public policy to foster the equality of socio-economic opportunities more generally and along gender lines. Promoting equality of opportunities generally enhances mobility across the board, while the gender focus in this allows narrowing the gap in mobility between men and women.

The analyses on mobility in terms of non-monetary measures suggest that children are generally more likely to excel their fathers educationally, which is perhaps not too surprising given the rapid expansion in access to education at all levels over the last two decades. Thus, educationally, the results found suggest significant intergenerational mobility. On the other hand, there appears to be little or no mobility in Ethiopia occupationally. The results from the non-monetary analysis highlight some gender disparity in mobility. Specifically, sons are found to excel their fathers relatively more than daughters do, particularly when it comes to the highest levels of educational status observable. Generally, compared with daughters, sons are found to be more (less) likely to attain higher (lower) levels of education than their fathers. This is in line with the evidence elsewhere in the literature. Even though there has been a significant widening of

educational opportunities in Ethiopia recently, the evidence elsewhere in the literature points to a significant gender gap in favour of males especially when it comes to enrolment to territory level education. The evidence on occupational mobility is weak overall. Still, sons appear to be generally better placed to have better or same level of occupational status as their fathers' vis-à-vis daughters.

The paper has several strengths. It is the first to tackle the issue of mobility in the context of a low income Sub-Saharan African country. As such, it is likely to offer valuable first insights into issues of intergenerational mobility in this context. Its approach of using both monetary and non-monetary measures of socio-economic status in examining intergenerational mobility is also its strength, as this is likely to offer a more comprehensive account of mobility than what would be obtained by focusing exclusively on monetary measures, as much of the literature does. Unlike much of the literature, the paper has also made some attempt to study the intergenerational mobility of young adult females. As discussed in the paper, the labour market histories of women, which is often characterised by interruptions, makes it harder to study women in the context of intergenerational mobility in earnings, where longer-term ("permanent") status is important. This is the main argument given for excluding women from the bulk of the intergenerational mobility literature. In the context of a low income country, this is an even bigger and insurmountable challenge in many ways, since it is next to impossible to observe mothers (or older generation women) with formal employment and/or earnings histories. On the other hand, there is a limited scope for studying young adult daughters' mobility vis-à-vis their fathers' socio-economic status. This paper has attempted to do this, despite some of the caveats discussed, since such an analysis allows us to gain some limited insight into potential gender disparities in socio-economic status between sons and daughters, which social policy may usefully address.

The paper has several caveats worth noting, most of which emanate from the lack of suitable data, which afflicts much of the work on the developing world. First, the Labour Force Survey Data used monitors only those individuals residing in a household at the time of the survey. Although young adult children in Ethiopia are likely to reside with their parents well into their adulthood due to the severe economic reality, including challenges in acquiring or renting own accommodation, it is likely that the study sample suffers from

the problem of selection. If more able children, in the sense of commanding better earnings and/or occupation, were to leave the sample households early, then we may be underestimating mobility. Secondly, the paper used snapshots of information on two child-father cohorts observed at the same point in time. This is in contrast to information at two or more time periods generation(s) apart, including recall information. This has contributed to the children in the current study to be fairly young, which has its own challenges that Nybom and Stuhler (2016) dwell on extensively. The young adult children are likely to be embarking on their career only just. As a result, we are unlikely to observe their full career potential, certainly in terms of earnings. This leads to what is termed in the literature as "lifecycle bias". The problem is likely to be exacerbated by the earnings measure the paper has used, which is monthly earnings as opposed to longer-term or "permanent" earnings, a matter dealt with extensively in a recent paper by Haider and Solon (2006) more recently and Jenkins (1987) previously, among others. Third, the sample used for the earnings analysis is relatively small. To a great extent, this is due to missing fathers' earnings. However, there are also significant number of daughters with missing earnings information. Even though bootstrapping has been implemented to circumvent some of the inference issues arising from small sample size, to the extent that the latter is the case, we may be looking at a sample selection problem once again, which is likely to bias our estimates for daughters in particular. These are major caveats in some sense. On the other hand, the approach the paper used, which combines monetary and non-monetary outcomes, is likely to address some of these caveats up to a point. Even so, caution may have to be exercised in reading some of the important findings in the paper.

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Table 1: Summary Statistics from Child-Father Income Quantiles, LFS 2005 & 2013 (%)

	Sons & Daughters (1)	Son (2)	Daughter (3)	Diff. (2–3)
Combined 2005 & 2013 sample (*N*=1186)				
% in lower income quantile than father	19.2	13.8	27.4	-13.4***
% in the same income quantile as father	28.4	25.9	32.0	-6.0*
% in higher income quantile than father	52.4	60.3	40.9	19.4***
Total	100	100	100	100
2005 sample (N=397)				
% in lower income quantile than father	24.3	19.3	32.2	-12.9***
% in the same income quantile as father	34.5	31.7	38.9	-7.0*
% in higher income quantile than father	41.3	50.0	28.9	20.1***
Total	100	100	100	100
2013 sample (N=789)				
% in lower income quantile than father	16.7	11.0	24.9	-13.9***
% in the same income quantile as father	25.4	23.0	28.9	5.9**
% in higher income quantile than father	57.9	66.1	46.3	19.8***
Total	100	100	100	

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

Authors own computation based on Ethiopian LFS 2005 & 2013.

Table 2: Intergenerational Income Mobility of Sons and Daughters, OLS & Quantile Regression.

	OLS	Q(.1)	Q(.25)	Q(.5)	Q(.75)	Q(.9)
Sons & Daughters, 2005						
Father's income	0.462***	0.504***	0.523***	0.554***	0.472***	0.394***
	(0.078)	(0.157)	(0.148)	(0.097)	(0.903)	(0.179)
N	397	397	397	397	397	397
Sons, 2005						
Father's income	0.394***	0.529**	0.476***	0.462***	0.423***	0.347***
	(0.098)	(0.237)	(0.172)	(0.089)	(0.097)	(0.044)
N	254	254	254	254	254	254
Daughters, 2005						
Father's income	0.585***	0.519**	0.547**	0.615***	0.586***	0.717***
	(0.198)	(0.213)	(0.238)	(0.229)	(0.214)	(0.237)
N	143	143	143	143	143	143
Sons & Daughters, 2013						
Father's income	0.376***	0.521***	0.463***	0.453***	0.383***	0.363***
	(0.068)	(0.097)	(0.079)	(0.085)	(0.086)	(0.098)
N	789	789	789	789	789	789
Sons, 2013						
Father's income	0.367***	0.582***	0.443***	0.397***	0.381***	0.358***
	(0.082)	(0.079)	(0.098)	(0.068)	(0.059)	(0.098)
N	478	478	478	478	478	478
Daughters, 2013						
Father's income	0.496***	0.470**	0.427***	0.496***	0.512***	0.632***
	(0.173)	(0.210)	(0.175)	(0.098)	(0.091)	(0.196)
N	311	311	311	311	311	311

Standard errors from 250 bootstrap replications in parentheses
The bootstrap replications are based on: 332; 225; 131; 655; 422 and 288 households, respectively, for sons & daughters, 2005; for sons, 2005; daughters, 2005; sons and daughters, 2013; sons, 2013 and daughters 2013.
*p<0.1, ** p<0.05, *** p<0.01

Table 3: Summary Statistics, Patterns of Child-Father Highest Educational Level Attained (%)

	Sons & daughters (1)	Son (2)	Daughter (3)	Diff. (2–3)
Combined 2005 & 2013 sample (*N=13252*)				
% in a lower level than their father	6.1	4.5	8.4	-4.0***
% in the same level as their father	30.8	28.6	33.8	-5.2***
% in higher level than their father	63.1	66.9	57.8	9.1***
Total	100	100	100	
2005 sample (N=5493)				
% in a lower level than their father	4.3	3.3	5.6	-2.2***
% in the same level as their father	31.8	29.8	34.6	-4.8***
% in higher level than their father	63.94	66.9	59.8	7.0***
Total	100	100	100	
2013 sample (N=7759)				
% in a lower level than their father	7.5	5.3	10.4	-5.1***
% in the same level as their father	30.0	27.7	33.2	-5.4***
% in higher level than their father s	62.5	66.9	56.4	10.6***
Total	100	100	100	

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

Authors own computation based on Ethiopian LFS 2005 and 2013.

Table 4: Intergenerational Mobility in Educational Attainment of Sons & Daughters, Marginal Effects from Generalised Ordered Logit Models

	No education	Grades1-6	Grades 7-10	Grade11 & higher
Sons & Daughters, 2005				
Grades1-6	-0.128***	-0.0968***	-0.0393**	0.264***
	(0.00829)	(0.0109)	(0.0156)	(0.0176)
Grades 7-10	-0.135***	-0.160***	-0.114***	0.409***
	(0.00752)	(0.0103)	(0.0218)	(0.0233)
Grade11 & higher	-0.141***	-0.198***	-0.183***	0.522***
	(0.00762)	(0.00868)	(0.0167)	(0.0178)
N	5493	5493	5493	5493
Sons, 2005				
Grades1-6	-0.111***	-0.106***	-0.0567***	0.274***
	(0.00935)	(0.0151)	(0.0209)	(0.0233)
Grades 7-10	-0.109***	-0.186***	-0.113***	0.407***
	(0.00746)	(0.0133)	(0.0285)	(0.0302)
Grade11 & higher	-0.102***	-0.211***	-0.246***	0.559***
	(0.00782)	(0.0104)	(0.0156)	(0.0208)
N	3210	3210	3210	3210
Daughters, 2005				
Grades1-6	-0.149***	-0.0886***	-0.0504***	0.288***
	(0.0117)	(0.00892)	(0.00939)	(0.0238)
Grades 7-10	-0.169***	-0.124***	-0.149***	0.442***
	(0.0111)	(0.0106)	(0.0199)	(0.0335)
Grade11 & higher	-0.193***	-0.140***	-0.174***	0.507***
	(0.0111)	(0.0103)	(0.0175)	(0.0275)
N	2283	2283	2283	2283
Sons & Daughters, 2013				
Grades1-6	-0.0627***	-0.0668***	-0.0642***	0.194***
	(0.00505)	(0.00769)	(0.0135)	(0.0148)
Grades 7-10	-0.0633***	-0.0927***	-0.0933***	0.249***
	(0.00519)	(0.00861)	(0.0186)	(0.0200)
Grade11 & higher	-0.0945***	-0.141***	-0.247***	0.483***
	(0.00541)	(0.00746)	(0.0141)	(0.0149)
N	7759	7759	7759	7759
Sons, 2013				
Grades1-6	-0.0565***	-0.0844***	-0.0739***	0.215***
	(0.00613)	(0.0100)	(0.0183)	(0.0193)
Grades 7-10	-0.0581***	-0.103***	-0.103***	0.263***
	(0.00607)	(0.0113)	(0.0258)	(0.0269)
Grade11 & higher	-0.0619***	-0.155***	-0.303***	0.521***
	(0.00562)	(0.00779)	(0.0151)	(0.0181)
N	4483	4483	4483	4483
Daughters, 2013				
Grades1-6	-0.0679***	-0.0595***	-0.0504***	0.178***
	(0.00754)	(0.00706)	(0.00831)	(0.0197)
Grades 7-10	-0.0812***	-0.0774***	-0.0980***	0.257***
	(0.00772)	(0.00806)	(0.0150)	(0.0266)
Grade11 & higher	-0.128***	-0.124***	-0.203***	0.454***
	(0.00871)	(0.00864)	(0.0160)	(0.0223)
N	3276	3276	3276	3276

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

Table 5: Summary Statistics, Patterns of Child-Father Occupational Status (%)

	Sons & daughters (1)	Sons (2)	Daughters (3)	Diff. (2–3)
Combined 2005 & 2013 sample (N=13252)				
% in a lower occupational group than father	32.4	30.8	34.7	-4.0***
% in the same occupational group as father	32.9	32.8	33.1	-0.22
% in higher occupational group than father	34.6	36.4	32.2	4.2***
Total	100	100	100	
2005 sample (N=5493)				
% in a lower Occupational group than father	35.9	35.4	36.6	-1.2
% in the same Occupational group as father	32.0	31.7	32.5	-0.8
% in higher Occupational group than father	32.1	33.0	30.9	2.1*
Total	100	100	100	
2013 sample (N=7759)				
% in a lower Occupational group than father	30.0	27.5	33.4	-6.0***
% in the same Occupational group as father	33.6	33.7	33.5	-0.3
% in higher Occupational group than father	36.4	38.8	33.1	5.7***
Total	100	100	100	

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

Authors own computation based on Ethiopian LFS 2005 and 2013.

Table 6: Intergenerational Mobility in Occupational Status of Sons & Daughters, Marginal Effects from Generalised Ordered Logit Models

	Elementary	Skilled Agricultural	Services & Sales	Machine & crafts	Managerial & Professional
Sons & daughters, 2005					
Skilled Agricultural	-0.163***	0.384***	-0.0856***	-0.0729***	-0.0622***
	(0.0156)	(0.0156)	(0.0109)	(0.0105)	(0.00572)
Services & Sales	-0.0348*	-0.0544***	0.130***	-0.0302**	-0.0105
	(0.0195)	(0.0127)	(0.0186)	(0.0128)	(0.00689)
Machine operator	-0.0601***	-0.0331***	-0.0110	0.135***	-0.0303***
	(0.0187)	(0.0127)	(0.0138)	(0.0175)	(0.00568)
Managerial & Prof.	-0.0629**	-0.0539***	0.0637**	-0.00443	0.0577***
	(0.0279)	(0.0138)	(0.0258)	(0.0194)	(0.0163)
N	5493	5493	5493	5493	5493
Sons, 2005					
Skilled Agricultural	-0.175***	0.422***	-0.0640***	-0.117***	-0.0649***
	(0.0192)	(0.0201)	(0.0120)	(0.0145)	(0.00829)
Services & Sales	-0.0583**	-0.0449**	0.133***	-0.0169	-0.0128
	(0.0233)	(0.0176)	(0.0225)	(0.0188)	(0.00973)
Machine operator	-0.0395*	-0.00979	-0.00774	0.0844***	-0.0273***
	(0.0237)	(0.0183)	(0.0161)	(0.0223)	(0.00861)
Managerial & Prof.	-0.0671*	-0.0792***	0.0899***	-0.0162	0.0725***
	(0.0343)	(0.0202)	(0.0334)	(0.0287)	(0.0246)
N	3210	3210	3210	3210	3210
Daughters, 2005					
Skilled Agricultural	-0.132***	0.315***	-0.123***	-0.0112	-0.0493***
	(0.0259)	(0.0236)	(0.0212)	(0.0158)	(0.00717)
Services & Sales	0.00374	-0.0625***	0.117***	-0.0465***	-0.0118
	(0.0331)	(0.0187)	(0.0322)	(0.0160)	(0.00770)
Machine operator	-0.0704**	-0.0499***	-0.0480*	0.197***	-0.0288***
	(0.0313)	(0.0180)	(0.0285)	(0.0294)	(0.00693)
Managerial & Prof.	-0.0280	-0.0443*	-0.00360	0.0277	0.0482**
	(0.0482)	(0.0229)	(0.0442)	(0.0271)	(0.0209)
N	2283	2283	2283	2283	2283
Sons & Daughters, 2013					
Skilled Agricultural	-0.0731***	0.332***	-0.124***	-0.0451***	-0.0889***
	(0.0133)	(0.0138)	(0.00880)	(0.00734)	(0.00779)
Services & Sales	-0.00349	-0.0543***	0.0725***	0.00773	-0.0225**
	(0.0158)	(0.0116)	(0.0147)	(0.00968)	(0.00933)
Machine operator	-0.0123	-0.0470***	-0.0530***	0.124***	-0.0115
	(0.0208)	(0.0159)	(0.0148)	(0.0181)	(0.0126)
Managerial & Prof.	-0.0661***	-0.0908***	-0.00571	0.00374	0.159***
	(0.0181)	(0.0135)	(0.0167)	(0.0108)	(0.0189)
N	7759	7759	7759	7759	7759
Sons, 2013					
Skilled Agricultural	-0.0712***	0.330***	-0.112***	-0.0753***	-0.0713***
	(0.0165)	(0.0183)	(0.0111)	(0.0123)	(0.0118)
Services & Sales	-0.0134	-0.0644***	0.0810***	0.00953	-0.0128
	(0.0189)	(0.0153)	(0.0191)	(0.0165)	(0.0143)
Machine operator	-0.0425*	-0.0430**	-0.0650***	0.151***	-0.000963
	(0.0239)	(0.0217)	(0.0184)	(0.0275)	(0.0190)
Managerial & Prof.	-0.0661***	-0.114***	-0.00891	-0.0233	0.213***

	(0.0222)	(0.0190)	(0.0232)	(0.0214)	(0.0300)
N	4483	4483	4483	4483	4483
Daughters, 2013					
Skilled Agricultural	-0.0637***	0.329***	-0.148***	-0.0220***	-0.0953***
	(0.0221)	(0.0207)	(0.0161)	(0.00824)	(0.0105)
Services & Sales	0.0180	-0.0384**	0.0429*	0.00722	-0.0298***
	(0.0269)	(0.0183)	(0.0236)	(0.00979)	(0.0115)
Machine operator	0.0337	-0.0409*	-0.0667**	0.0845***	-0.0106
	(0.0362)	(0.0245)	(0.0267)	(0.0219)	(0.0171)
Managerial & Prof.	-0.0371	-0.0743***	-0.0160	0.00343	0.124***
	(0.0312)	(0.0196)	(0.0263)	(0.0117)	(0.0246)
N	3276	3276	3276	3276	3276

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