The Existence and Structure of Rural Households' Income Mobility: Evidence from Panel Data in Ethiopia (2011-2016)[1]

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Abstract

Ethiopia's economic reports on income inequality, poverty, and other welfare indicators have been promising for the last two decades. It is quite relevant to understand how rural households from different income classes perform over time, income mobility. Income mobility can be regarded as a transformation between two income vectors over a period of time where some are expected to climb or may slide down and moves from one step to another at different rates. This study investigates the existence and structure of households' income mobility in Ethiopia using three waves of the household panel survey for the period of 2011to 2016. It employs Shorrock's rigidity index, transition probability matrix, and Field and Ok (1999) methods for the analysis. The finding of the study points out that income mobility exists with a higher rate of both relative and absolute income mobility. The result of decomposition of income sources have showen that income obtained from nonfarm sources have positively contributed to the difference in income mobility between rural households whereas the decomposition of income effects have revealed that growth effect is the leading factor compared to transfer effect. Hence, the finding shows the need to implement policies targeting income growth to shorten mobility gaps.

Keywords: Income Mobility, Field and Ok, Shorrock's Index, Transition Matrix, Ethiopia

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1. Introduction

In the year 2010-2020, Africa has made remarkable progress in economic growth indicators. Recent data shows that African countries' gross domestic product has reached 3.4 percent in 2019 and 3.9 percent in 2020 (ADB, 2020). Africa's real GDP is projected to grow by 3.4 percent in 2021, after contracting by 2.1 percent in 2020. This projected recovery from the worst recession in more than half a century will be underpinned by a resumption of tourism, a rebound in commodity prices, and the rollback of pandemic-induced restrictions (ADB, 2021).

When we look at Ethiopia's economic progress, the poverty levels fell by around 20% between 2011 and 2016. The headcount poverty rate declined from about 93% in 2000 to 45.5 % in 2017 and 5.3 million people have lifted out of poverty in 2017 (WB, 2018). Compared with other East Africa countries, Ethiopia is registered to be the lowest level of extreme poverty, at 15.9 percent from 2020 to 2021; however, income inequality also has increased slightly from 0.30% in 2011 to 0.33 in 2016.

One of the most important factors is believed to be related to economic progress is the issue of income change. Studies have recommended investigating the relevance of examining how people are moving along the income distribution using welfare indicators such as income, consumption, and asset by providing a wider perspective of how the distribution of income evolves (Corak, 2013; Lambert and Rossi, 2016; Alesina et al., 2017; Dabla-Norris et al.,2015; Alvaredo and Gasparini, 2015).

The measurement of income change is an essential component to know where we stand to use for policy-making. For instance, a society's progress or socio-economic development is often gauged by how much people's well-being or living standards have improved and by how much socio-economic deprivation has been reduced over time which allows identifying priorities that will put the needs of the people first and will address the challenges that societies face ahead (Martinez, 2017; Nolan, 2018; Atkinson *et al.*, 2017).

The extent to which households move across different economic positions (income over time in our case), income mobility, is a central issue in a variety of public policy discussions today. Income mobility, in this regard, is seen as indicative of the opportunities afforded by society to escape one's origins where most policymaking is gauged by how much people's well-being or living

standards have improved/ deprived of over time that allows identifying priorities and challenges in the society (Krebs et al., 2012; Efa Gobena and Bizualem, 2017; Martinez, 2017; Atkinson et al., 2017; Nolan, 2018).

Understand how income evolves, often seen as examining equality of opportunity (Shorrock, 1978; Fields, 2010; Jenkins, 2011). This is because different income mobility levels such as upward movers and downward movers can call for a different mix of policies. Thus, understanding income mobility supports policymaking to be efficient in terms of resources and time allocation (Martinez, 2017).

The existing literature has proposed that several measures to evaluate income mobility such as expenditure and income. Income is preferred to analyze sources of mobility. In some contexts, income might actually be more accurate than expenditures in cases where consumption instrument is overly complex and undergoes changes over time. On the other hand, expenditures are typically a better guide to long-term well-being of the household or its 'permanent income' as household will exercise some consumption smoothing. In most cases, expenditures are more accurately captured particularly among the poor who have relatively constant and well-known expenditures on relatively few items while their incomes can be very erratic and unpredictable. The study has access to income and expenditure data and uses both.

Although there has been vast research on income mobility in most of the advanced economies and little is found in developing countries, there is no evidence in the face of Ethiopia on income mobility to date. An issue is particularly relevant because most policy designed to reduce poverty and disparities among households, aiming to increase mobility in the process deserves closer scrutiny. Having these concerns, this study intends to evaluate the existence and structure of the households' income mobility, further disaggregating relative and absolute household income mobility in Ethiopia.

2. Data and Methods

2.1 Data Sources, Collection Method, and Type

The study has used panel data collected by the World Bank in collaboration with the Ethiopia Central Statistics Agency (CSA) as the Living Standard Measurement Survey-Integrated Agricultural Survey (LSMS-ISA). The survey has three rounds collected in 2011/2, 2013/4, and 2015/6 as the first wave,

second wave, and third wave, respectively. The panel dataset is a nationwide survey collected using multistage probability samples of households. First, the domains of the study are identified (regions, urban/rural) using a stratified random design. Second, enumeration areas (EAs) were selected with probability proportional to size. Third, the primary sampling units (PSU) are geographically defined area units selected with probability proportional to size based on the last population census in the country. Finally, once the PSUs have been selected, an enumeration of these PSUs is carried out to ensure that an accurate and up-to-date listing of all dwellings and households is available. With a complete current list of all dwellings in the PSU, the secondary sampling units (households) are selected using systematic random sampling in both rural and small towns. The first wave collected includes only rural and small-town areas; however, the second and third waves expanded to include urban areas (Table 1).

Table 1: The sampling frame and sample distribution of the survey

	Wave One				Wave Two				Wave Three			
	Rural		Small town		Rural	Small towns	Large towns		Rural	Small towns	Large towns	
	EAs	HHs	EAs	HHs	EAs	EAs	EAs	HHs	EAs	EAs	EAs	HHs
National	280	3466	43	503	280	42	73	5262	280	42	73	4954
Tigray	30	360	4	48	30	4	15	633	30	4	15	633
Afar	10	120	2	24	10	2	1	159	10	2	1	159
Amhara	61	728	11	127	61	10	15	1077	61	10	15	1077
Oromiya	55	656	11	125	55	10	20	1080	55	10	20	1080
Somali	20	237	3	36	20	3	3	321	20	3	3	321
Benishangul	10	120	1	12	10	1	0	132	10	1	0	132
SNNP	74	885	10	119	74	10	15	1233	74	10	15	1233
Gambella	10	120	1	12	10	1	1	147	10	1	1	147
Harari	10	120	0	0	10	1	3	177	10	1	3	177

Note: HHs = households interviewed, EAs= Enumeration area numbers

Sources: Author's calculation using ESS data 2011/12, 2013/13 and 2015/16 waves

A total of 3969 households from wave one, 5262 households from wave two, and 4954 households from wave three were interviewed with a total of 6.8 attrition rate for rural households. As the study is based on rural households, large towns were considered only in the second and third waves, those samples from urban were automatically excluded from the analysis. The study further imposes a restriction on the sample size due to missing information in the consumption data, and households with zero total consumption (Table 2).

Table 2: Sample size and excluding criteria

No.	Excluded the household due to	Wave-one		Wave-Two		Wave-Three	
		Total	Excluded	Total	Excluded	Total	Excluded
1	The domain of the study	3969	-	5262	1,486	4954	1,255
2	Lost to Attrition	3969	270	3776	77	3699	-
3	Missing information on consumption aggregate*	3669	67	3699	145	3699	146
4	No food consumption reported	3632	70	3554	168	3553	164
5	Not Matched in both waves	3562		3386		3389	
Final Sample size (9,717)		3239		3239		3239	

Note: *missing information refers to the purchased items with no valid conversion factor to convert food items to monetary values

Sources: Author's calculation using ESS data 2011/12, 2013/13, and 2015/16 waves

The comparisons were conducted between the full sample, the subsample, and the balanced sample with measures of central tendency and dispersion of using household income and consumption data. It can be seen in Appendix Table 1 that the balanced subsample did not underestimate and the trend is consistent in both full sample and unbalanced samples. Thus, the study used a balanced subsample for the analysis.

2.2 Method of Data Analysis

2.2.1 Shorrock's rigidity index

The vast majority of income dynamics studies have focused on how the existence of mobility is measured in economies. The study uses Shorrock's rigidity index to analyze the existence of income mobility, in relative terms (Shorrock, 19870). Shorrock index, one of the single-stage indexes, is constructed

using Gini of the average income between the periods with the weighted average of the Gini in each period as follows;

$$R = \frac{G(x+y+z)}{\mu_x G_x + \mu_y G_y + \mu_z G_{yz} / \mu_x + \mu_{y+} \mu_z} \quad \textbf{(1)}$$

Where; R is rigidity index, Gx refers to the GINI coefficient and μ_x refers to mean income in the first period; Gy refers to the GINI coefficient and μ_y refers to mean income in the final period. The result of the rigidity index is interpreted as one would mean no mobility, while zero would indicate perfect mobility. In general, the larger the value rigidity index means the lesser mobility and larger permanent component of inequality measures and smaller the value of rigidity index means the higher mobility and smaller permanent component of inequality measure.

2.2.2 Transition probability matrix

There are cases where a single-stage index such as the Shorrock index may not capture a more disaggregated mobility. This is because the Shorrock rigidity index may reach no mobility if all income is increased at a constant proportion factor that only captures the variation in income share and ranks over time. In this case, a two-stage index has been suggested and this study uses a transition probability matrix to analyze the existence of income mobility, in absolute terms. The transition probability matrix is constructed by dividing into endogenously determined income/consumption groups of equal sizes (quintile in our case). This matrix is used to capture the growth dimension of income dynamics where immobility, upward mobility ratio, and downward mobility are described.

The result from this transition matrix can be interpreted as follows. The household experiencing change in income/consumption groups over three waves, from lowest to higher or vice versa are called 'mobiles', and those who does not experience change referred to as 'immobile'. From mobiles, those who experience change from lower-income/consumption groups to higher-income/consumption groups are referred to as 'upward income mobiles', and those who experience change from higher-income/consumption groups to lower-income/consumption groups are referred to as 'downward income mobiles'.

2.2.3 Structure of income mobility

The study also assesses the structure of income mobility by decomposing income mobility by sources and effects. The decomposition of income sources has been analyzed using GINI coefficient approach proposed by Lerman and Yitzhaki (1985). The method decomposes the income sources between and within total income, farm income, and non-farm incomes and stated as follows;

$$G = \sum_{i=1}^{k} S_K \, RG_K R_K \qquad \textbf{(2)}$$

Where; the GINI coefficient is the product of three components including share of income from a given total income (Sk), the GINI coefficient of income gap within each income category (Gk), and the GINI correlation between income from the given activity and total income (Rk). The decomposition of income mobility into growth and transfers effect were also analyzed using Fields and Ok [1999] method that measures changes in income between two periods. It is being stated with a single stage and axiomatic form as follows;

$$FO_n\,(x,y) = \left(\frac{1}{n}\sum_n^1 |lny_i - lnx_i|\right) + \left(\frac{2}{n}\sum_n^1 |lnx_i - lny_i|\right) \qquad \textbf{(3)}$$

Where; $x = x_1, x_2, x_3 \ldots\ldots\ldots x_n$ and $y = y_1, y_2, y_3 \ldots\ldots\ldots y_n$, the initial and final income, n is the number of households and FO is the change in expenditure/income from x to y. The first term on the left-hand side has represented welfare change due to the growth effect whereas the second captures the transfer effect.

3. Results and Discussion

3.1 Relative Income Mobility

The study has used Shorrock's rigidity index to estimate the relative income mobility of households based on adult equivalent consumption with per capita income for comparisons. A summary of the results of Shorrock's rigidity was presented in Table 3. The result showed that estimate from income data is higher than consumption data. This is because of two reasons. First, consumption smoothing makes expenditure less erratic, and secondly, respondents' behavior in reducing inequality. For instance, in the case of expenditure, the poor are reported

very well whereas the rich usually forget it, in case of Income, the rich tend to have predicted and stable income source more than the poor do as the result the poor tend to understate the income (Bound et al. 1991; Deaton, 1997).

The result also has shown that Ethiopia's rural households have a Shorrock's rigidity index of 0.97 which implies that a higher rate of income mobility exists in both income and expenditure data. A study in Egypt found that Shorrock's rigidity index was 0.95 for income and 0.934 for consumption and it concluded that Egypt is characterized by high mobility (Marotta and Yemtsov, 2010). Another study by Woolard & Stephan Klasen (2005) in South Africa indicated that the rigidity index for incomes and expenditures indicates a fairly high degree of mobility.

Table 3: Shorrock's rigidity index using income and expenditure, 2011-2016

GINI coefficient and Income/Consumption	Income-based		Consumption-based	
	Per capita	Total	Per adult equivalent	Total
GINI 2011	0.41162	0.427	0.75575	0.77502
GINI 2013	0.33746	0.36529	0.54975	0.54526
GINI 2016	0.34459	0.36384	0.76837	0.77897
Average GINI	0.36356	0.38409	0.69129	0.69975
Average Income/consumption 2011	5059.69	19430.37	2609.03	13445.68
Average Income/consumption 2013	5071.12	19538.02	2617.11	13639.9
Average Income/consumption 2016	5640.59	21537	5587.91	35226.19
Shorrock Rigidity Index	0.9993	0.9987	0.9703	9626

Sources: Author's calculation using ESS data 2011/12, 2013/13, and 2015/16 waves

3.2 Absolute income mobility

The result of relative income mobility already points a lot. However, it is essential to unpack mobility further and turn it into a transition matrix for a further disaggregated look. This is because relative income measurement does not show the difference in income due to the increase of proportion factor which only captures the variation of income shares or rank over time. The transition matrix for both expenditure and income were presented in Table 4 and Table 5. The transition matrix first, allocated household into income/expenditure groups,

income quintile in our case where Quintiles are numbered from 1 for the poorest to 5 for the richest, then examines the mobility between these income/expenditure quintiles groups.

It can be seen that 45% of the household who are in the richest quintile in 2011 remained there in 2013 and another 22% moved down just one quintile. Likewise, 52% of those who began in the poorest quintile were still there 3 year later and another 21% had moved up just one quintile. In the same manner, 40% of the household who are in the richest quintile in 2013 remained there in 2016 and another 24% moved down just one quintile. Likewise, 46% of those who began in the poorest quintile were still there 3 year later and another 24% had moved up just one quintile. This indicates that there is less mobility in the bottom and top quintiles than in the middle of the distribution. This can also be confirmed using the number of elements found in the diagonal section of transition matric. The number of elements in the transition matric found in the right of the diagonal section is slightly less than the element in the left. That is expecting slighter income mobility experience indicating there is less mobility in the top and bottom quintile than in the middle of the distribution. This is because the bottom (top) quintiles can only stay in the same quintile in which the income especially the right-hand tail is particularly large which is the reason why persistence in that group is particularly high (Table4).

Table 4: Transition Matrix by quintile using expenditure (Percentages), 2011-2016

		Wave 2						Wave 3					
		1	**2**	**3**	**4**	**5**			**1**	**2**	**3**	**4**	**5**
Wave 1	1	51.46	20.97	13.40	7.570	6.6	**Wave 2**	1	46.36	24.03	14.57	10.39	4.65
	2	25.59	23.96	24.68	16.94	8.83		2	24.36	24.87	24.19	17.67	8.92
	3	18.33	22.75	22.27	22.43	14.22		3	16.11	22.74	21.84	23.49	15.81
	4	11.77	16.28	23.26	28.63	20.06		4	7.14	18.54	25.23	26.29	22.8
	5	4.83	10.14	18.51	21.93	44.58		5	6.53	12.48	16.69	24.24	40.06
Total		19.91	18.0	20.50	20.31	21.27			19.76	20.35	20.41	20.56	18.93

Sources: Author's calculation using ESS data 2011/12, 2013/13, and 2015/16 waves
Note: the estimate is based on annual adult equivalent consumption

As a robustness check, the study further analyzed the rate of transition between waves (2011-2013, 2011-2016) using income data. The result indicated that 22% of the household who are in the richest quintile in 2011 remained there in 2013 and another 23% moved down just one quintile. Likewise, 22% of those who began in the poorest quintile were still there 3 year later and another 4% had moved up just one quintile. In the same manner, 28% of the household who are in the richest quintile in 2013 remained there in 2016 and another 22% moved down just one quintile. Likewise, 37% of those who began in the poorest quintile were still there 3 year later and another 21% had moved up just one quintile. This indicates that the matrix for both income and expenditure are remarkable similar (Table5).

Table 5: Transition Matrix by quintile using income (Percentages), 2011-2016

		Wave 2						Wave 3					
		1	2	3	4	5		1	2	3	4	5
Wave 1	1	21.77	23.990	21.47	17.44	15.32	**Wave 2**	1	36.700	21.100	14.91	14.45	12.840
	2	12.48	25.340	28.03	22.03	12.12		2	20.270	28.480	21.44	17.76	12.060
	3	7.760	16.300	23.91	31.37	20.65		3	12.690	20.190	22.37	26.33	18.420
	4	7.190	6.130	18.60	31.71	36.36		4	9.740	10.530	18.29	27.63	33.820
	5	10.86	5.750	15.65	17.57	50.16		5	9.540	5.470	9.960	19.35	55.680
Total		13.46	18.430	22.63	23.46	22.01			15.930	16.330	17.51	21.92	28.310

Sources: Author's calculation using ESS data 2011/12, 2013/13, and 2015/16 waves
Note: the estimate is based on annual income per capita

3.3 Structure of Income Mobility: Decomposition by Sources and Effects

From the above sections, it is understood how rural households from different income classes perform over time, income mobility. So, if need arises, the overall picture of improvements can be verified by knowing which income sources have led the mobility that happened in now rural Ethiopia. Thus, decomposing income sources, as well as income effects, are widely used in

welfare studies to understand the contribution of each income source and its effects on income mobility. The decomposition is used either by the income sources such as farm income, nonfarm income, total income and by the effect including growth effect, and transfer effect. This study employed a STATA user-writing program 'descoGini' for decomposing income sources developed by L'openz-Feldman (2006) which allows the estimation of bootstrapped standard errors, confidence intervals and marginal effect and 'fokmob' for decomposing effects developed by Phillip Van Kerm (2002).

2.2.4 Decomposition by Sources

Rural households in Ethiopia have different sources of income including nonfarm income and farm income (including crop income, livestock income and agricultural wage). Table 56 presents the result of decomposition by income sources between and within for total income, farm income and non-farm income.

For brevity, it is possible to start from between total income, farm income and non-farm income sources. The result of farm income shows that a one percent increase, all else being equal, decrease the Gini coefficient of total income by 0.27percent and it is unequally distributed (0.89%), and the Gini correlation between farm income and total income is 0.91 percent, indicating farm income is disfavoring the rich more than any other sources.

On the contrary, the result of nonfarm income shows that a one percent increase, all else being equal, increases the Gini coefficient of total income by 0.27percent and its Gini coefficients are higher than 1 reflecting the two notable findings. The first is the presence of some negative values where it is consistent with previous studies which argue that the ability to handle negative incomes is an advantage of the Gini coefficient over Atkinson's index (Lerman and Yitzhaki, 1985; Wodon and Yitzhaki, 2002). On the other side, the Gini coefficients of nonfarm income result showed that it may be overstated and appear to be larger than they appear in reality (Brenda, 2013). The Gini correlation between nonfarm income and total income is 0.92 percent, indicating nonfarm income is favoring the rich more than any other sources. Overall, the income derived from farm income has a higher share of total income (about 77 percent) and nonfarm income has a 23 percent share of total income with a positive effect. This is consistent with the fact that the majority of rural household income was derived from farm income.

Within income sources estimated under the last column of category four where total income is decomposed into a crop, livestock, agricultural wage, non-agricultural wage, self-employment/business, transfers and all other income. The result from this category has revealed that total income is highly unequally distributed among rural households with the highest Gini coefficient from crop income and the lowest from self-employment. In terms of share in total income livestock income, crop income and the non-agricultural wage have the top share of about 50 percent, 25perecnt and 20 percent respectively. The highest correlation between income sources and total income is observed for self-employment income, while the lowest is observed for transfer income. To conclude, a percentage change in the overall Gini coefficient indicates that, an increase in self-employment income results in an increase in total income and a decrease in the gap between income mobility of rural households, while other income sources have a decrease in total income and increase the gap between income mobility of rural households.

The result in Table 6 below shows that decomposed farm income into the crop, livestock and agricultural wage incomes with 32 percent, 66 percent, and 2 percent share in total income respectively. The household farm income is highly unequally distributed among rural households. A ten percent increase in the income obtained from livestock and agricultural wage, result from a decrease in a gap of income mobility between rural households by 43 percent and 26 percent, respectively, while, a ten percent increase in the income obtained from the crop, resulting in an increase in the gap of income mobility between rural households by 70 percent. This is due to the factor involvement of households in farming activities such as far size and related arrangements, which explain the gap between rural households. This is consistent with the previous study of Efa (2017).

Regarding nonfarm decomposition, it is observed that non-farm income is decomposed farm income into self-employment/business, non-agricultural wage, transfer and all other income with 21, 89, 13, 17 percent share in total income respectively. The household nonfarm income is unequally distributed among rural households. As a single percent increase in the income obtained from non-agricultural wage, transfer and all other income, result decreases in the gap of income mobility between rural households by 61, 10 and 15percent respectively. Similarly, a single percent increase in the income obtained from self-employment/business results an increase in the gap of income mobility between rural households by 86 percent. The reason for this is that income obtained from

non-farm income in general and self-employment, in particular, is the main inequality increase in sources of income.

Table 6: Decomposition of income sources: Farm, Nonfarm and total income components

Category	Income Source	S_k	G_k	R_k	Share	% Change
Total Income	Non-Farm	0.2291	2.9382	0.9192	0.4991	0.2699
	Farm	0.7709	0.8886	0.9068	0.5009	-0.2699
	Total Income		1.2400			
Farm Income	Crop	0.3220	1.0198	0.8902	0.3289	0.0070
	Livestock	0.6560	0.9398	0.9393	0.6517	-0.0043
	Ag.wage	0.0221	0.9904	0.7899	0.0194	-0.0026
	Farm		0.8886			
Non-farm Income	Self-Employ	-0.2057	-9.5988	0.9780	0.6573	0.8630
	NonAg. wage	0.8951	0.9725	0.9394	0.2783	-0.6168
	Transfer	0.1242	0.9390	0.6742	0.0268	-0.0974
	All Other	0.1865	0.9499	0.6252	0.0377	-0.1488
	Nonfarm		2.9382			
Total Income	Crop	0.2482	1.0198	0.7539	0.1539	-0.0943
	Livestock	0.5057	0.9398	0.8809	0.3376	-0.1681
	Ag.wage	0.0170	0.9904	0.6940	0.0094	-0.0076
	Self-Employ	-0.0471	-9.5988	0.9236	0.3370	0.3841
	NonAg. wage	0.2051	0.9725	0.8615	0.1386	-0.0665
	Transfer	0.0285	0.9390	0.4096	0.0088	-0.0196
	All Other	0.0427	0.9499	0.4483	0.0147	-0.0281
	Total Income		1.2400			

Source: author's calculation using ESS data 2011/12, 2013/13, and 2015/16 waves

Note: S_k: represents the share of income from a given in total income

G_K: represents the Gini coefficient of income gap within each income category

R_K: represents the Gini correlation between income from the given activity and total income % Change: represents

3.3.2 Decomposition by effects

As shown above, absolute and relative income mobility, as well as the structure of income of households, are experiencing both negative and positive income mobility. The mobility are caused by either of the two effects including the growth effect in which the household relative income position in the population has not to change and the transfer effect caused by the relative position change. Field and Ok (1996) suggested that income mobility may be due to the transfer effect if income transfers from one household to another household while the growth effect occurs when the household gain from economic opportunities when there is an economic growth.

The decomposition result in Table 7 showed that the total effect on relative mobility (based on expenditure) was 52 % in 2011 to 2014, 50% in 2014 to2016 and 58% 2011 to 2016 which the total effect on relative mobility in income mobility is like "U" type processing. The total effect on absolute mobility based on expenditure showed that there is a slight income growth from 2011-2016 (absolute percentage index of 3.95 percent from 3.45 percent). This is because households can participate in diversified income sources and other income-generating activities. The result of the effect on relative mobility and absolute mobility is similar when considering income and consistent with previous studies (Jiang et al., 2016; Melcah, 2020).

The Growth Effect, Fields & Ok (1999) Absolute income Mobility has indicated upward income mobility with an absolute percentage index of 1.10 percent from 5.86 percent while Fields & ok (1999) relative income mobility has indicated downward income mobility with a relative percentage index of 84 percent from 83 percent in terms of expenditure. On average from 2011-2016, there is 5.76 percent growth effect in absolute terms and there is 41.7 percent growth effect in relative terms. Thus, the growth effect has shown an upward effect in absolute terms while a downward effect in relative terms.

The transfer effect can be seen that, on average from 2011-2016, there is 3.38 percent transfer effect in absolute terms and there is 17 percent transfer effect in relative terms (Table 6). Overall, the result is consistent with studies that argue that income growth contribution is better than the transfer where income growth is the main source for income mobility (Jiang et al., 2016; Melcah, 2020).

Table 7: Decomposition of income mobility: transfer and growth effect

Mobility Type	Time Periods	Expenditure Based			Income-Based		
		Total effect	Growth effect	Transfer effect	Total effect	Growth effect	Transfer effect
Fields & Ok (1999) Absolute Mobility Index	2011-2014	3.45	1.10	3.44	6.18	2.38	5.94
	2014-2016	3.33	5.86	2.74	8.69	3.11	5.57
	2011-2016	3.95	5.76	3.38	9.95	3.27	6.68
Fields & Ok (1999) Relative Mobility Index	2011-2014	0.519	0.084	0.436	1.176	0.567	0.608
	2014-2016	0.504	0.083	0.420	0.981	0.024	0. 579
	2011-2016	0.583	0.417	0.166	1.332	0.574	0.758

Sources: Author's calculation using ESS data 2011/12, 2013/13 and 2015/16 waves

4. Conclusions and Recommendations

A recent estimate of income inequality, poverty, and other welfare indicators has shown an improvement in Ethiopia. These key economic development indicators cannot answer two questions. One, 'Are the richer getting rich and the poor getting poorer?' 'Who are winners and looser during the economic process?' To answer these questions, it is important to conduct income mobility analysis, tracking the households' income over time. Analysis of income mobility provides a broader picture of the income distribution dynamics which leads to sub-optimal intervention. The overall objective of the study was to generate evidence on the existence and structure of households' income mobility in Ethiopia using balanced panel data that has three waves collected in 2011/2, 2013/4, and 2015/6.

The study used Shorrock's rigidity index, transition probability matrix, Field and Ok (1999) methods for analysis. Overall, there is a fairly high degree of mobility in both income and expenditure in Ethiopia. The transition matrix result, for stayer/non-mobile, has revealed that there is less mobility in the top and bottom quintile than in the middle of the distribution. For upward mover, the result has indicated that those households who were in the first income status were likely to experience an income increase.

To sum up, Shorrock's rigidity index and the transition probability matrix has showed the sampled households have experienced slighter income mobility and proved the existence of relative and absolute income mobility in Ethiopia. Thus, the finding from relative and absolute income has two main important points. First, is used as the roadmap for other parts of the study where is used to differentiate the income mobility distribution. Second, the findings of bottom-level households that have experience of income mobility are an important area for policy targeting. The decomposition result has also showed that the income mobility difference among rural households in Ethiopia was embodied in the nonfarm income and growth effect. As the result, it is relevant to target income growth effect and income-generating activities to shorten the income mobility gaps.

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