



The Impact of Mobility on Long-term Inequality: An Analysis from Selected Districts of Punjab Province, Pakistan

Samra Kahlid^a, Nabila Asghar^b and Hafeez ur Rehman^c, ^aAssistant Professor, Higher Education Department, Government of the Punjab Lahore, Pakistan, ^bAssociate Professor, Department of Economics and Business Administration, Division of Arts & Social Sciences, University of Education Lahore, Pakistan. ^cProfessor/Chairman, Department of Economics-SBE, University of Management and Technology Lahore, Pakistan. (Corresponding Author) Email: ^asamrakahlid88@yahoo.com, ^bdrnabeelakhan.eco@gmail.com, ^{c*}hafeez.rehman@umt.edu.pk

Since the beginning of this century, researchers and policy makers have been concerned about the crucial relationship between mobility and long-term inequality particularly in developing countries. This study deals with the long-term inequality that emerges in a society due to socio-economic stratification over time. The assessment of the relationship between mobility and long-term inequality may enable us to determine the direction of mobility in terms of convergence or divergence. For analysis purposes, this study uses primary data from six developed and backward districts of province Punjab, Pakistan. The results of the study show that developed and big districts exhibit more dis-equalizing occupation income due to the excessive availability of opportunities, occupation diversity, competition and more income generating activities, which increases the income inequality among households. This study suggests that dis-equalizing effects can be reduced though proportionate distribution of economic resources among ruler and lower struggling class in Punjab province.

Key words: *long-term inequality, socio economic opportunity, pro-poor growth, upward mobility*

1. Introduction

In recent years, the relationship between economic mobility and income inequality has gained significant attention of researchers and policy makers. For analysing the structure of society, it is appropriate to measure long-term inequality rather than instant inequality. Economic mobility is related to the movement of household's economic well-being as it shows their transformation toward upper ladder overtime. Mobility and inequality both move together and their direction of convergence or divergence depends upon the economic conditions prevailing in the economy. The main purpose of economic mobility is to measure the way in which long-term income is distributed in a society (Fields & Ok, 1999; Checchi & Dardanoni, 2003). In the presence of rapid economic mobility, the high degree of income inequality in the current period is not that important because if long-term income is distributed more equally than initial income, mobility is said to be equalised long-term income in respect to first year income, and vice versa. This indicates that for developing countries, it is important to measure long-term inequality and to develop its relation with economic mobility. The high level of short-term inequality can be acceptable with significant level of mobility because the distribution of lifetime income equalises more evenly among all the groups of society and it brings up the comprehensive structure of society in the context of convergence or divergence (Atkinson & Bourguignon., 1982; Jarvis & Jenkins, 2001).

In recent years, researchers and policy makers have realised the significance of measuring the structure of the society in terms of long-term inequality which emerges due to economic mobility. Furthermore, the existing literature fails to bring up the sign of convergence or divergence of households caused by economic mobility over time. The researchers agree that most social problems can be tackled properly with the appropriate analysis of the changes that emerge in a society due to economic mobility and socio-economic transformation.

In Punjab province, no remarkable effort has been made to analyse the important relationship between mobility and long-term inequality. Furthermore, no remarkable research work is available on Punjab province which measures the movement of mobility in terms of time dependence, positional movement and share movement. The analysis of the impact of mobility on long-term inequality may be helpful for policy makers to formulate appropriate policies for bringing social justice and harmony in Punjab province. This study may bridge the research gap by comparing economic mobility and intensity of income inequality. The major contribution of this study includes the quantification of the aspects of mobility in terms of time dependence, positional movements, share movements and mobility as an equaliser of long-term income. Furthermore, the analysis of the study may be a valuable addition to the existing literature, as it throws light on the cost of mobility paid by the selected districts of Punjab province.

2. Literature Review

In the existing literature, several studies have been conducted which measure short-term inequality. These studies, however, ignore the significant relationship between mobility and long-term inequality in the context of developing countries. The previous research work identifies several factors which contribute to economic mobility and income inequality.

Cichello and Frieji (2003) pointed out that several factors such as human capital, the labour market, the economic situation, and aggregate economic shocks influence the convergence of a society. Their study, however, did not identify a significant relationship between changes in current income and base year income. Anwar (2005) describes that in Pakistan, Gini coefficient was generally higher in urban than in the rural areas because the urban labour force was more diversified in terms of skills, education, union membership, uneven distribution of income, coverage by the minimum wage legislation, and difference in access to the labour market. Income from independent work was more packed in urban regions than in rural areas because urban employees had more chances to get prestigious jobs when compared to rural workers, particularly in underdeveloped areas. Their study concluded that inequality and socio-economic opportunities move together.

Fields *et al.* (2005) analysed the relationship between mobility and income inequality for Latin American countries. Their results showed that mobility and inequality both move in the same direction and socio-economic mobility sometimes causes an increase in income inequalities which indicate that the structure of income distributions was not rigid from base year to final year in these countries. However, poor workers faced low rates of inequality as compared to middle income and high income workers.

Hungerford (2008) analysed the role of socio economic factors on mobility using multinomial logistic regression. The results of their study showed that the long-term income inequality is lower than income inequality in the first year of the decade. Their study concluded that less dependency ratio, more earning members and higher levels of education, particularly in young people, have positive and significant impact on socio-economic mobility.

Torche (2014) discussed the distinctive characteristic of Latin American societies in terms of mobility and inequality. The study reviewed two generations of mobility since the 1960s and examined the linkages between mobility and macro-level factors. The results of the first generation class mobility between 1960-1970 showed that an earner's resources exert positive impact on the achievements of their children and the role of education as facilitating factor in the stratification process were parallel in the Latin America and the United States. The results of second generation class mobility since 1990s in Latin America supported common fluidity with no sign of differences in pattern as compared to first generation's class mobility. Their study concluded that intergenerational class association was not stronger in Latin American countries as compared to industrial world.

Goldthorpe (2016) measured the relationship between mobility and long-term inequality in the context of class structure. The results showed that movement of classes among socio-economic hierarchy was a major factor which determines socio-economic changes overtime. The study concluded that the major indicator of long-term inequality was relative mobility which measured the chances of individuals from different class origins who arrived at different class destinations.

Friedman (2017) measured the comprehensive analysis of social mobility using data from new socio-economic UK Labor Force Survey (LFS). The results of this study show that 43% of households in the UK experience upward mobility as compared to their parents, whereas 29% experience downward movement, while 45% of income inequalities were passed across generations. The results of logistics regression showed that households who belong to a professional background had 2.5 times higher odds than households from less advantaged backgrounds.

Khalid and Asghar (2018) analysed the socio-economic stratification and mobility across the time on the basis of base year and final year in Southern Punjab, Pakistan. The findings of the study revealed that society experienced an increase in the size of ruler strata which was not due to decrease in bottom strata. The study concluded that there existed a positive relationship between socio-economic mobility and life chances of the society.

Khalid and Asghar (2019) point out that improvement in education played a significant role in upward transmission of households. The geographical and occupational movements contributed to both inter-temporal and intra-generational mobility in the central Punjab, Pakistan. The findings of their study showed that households from urban areas enjoyed sufficient benefits of occupational movement as compared to households from rural areas. Their study, however, did not highlight the distribution of long-term income which emerged due to mobility and also ignored the impact of mobility on consumption pattern of households. The study suggested the need for studying the trickledown effect of the labour market from ruler to struggling strata in Central Punjab.

The above mentioned studies use several estimation techniques for measuring both mobility and income inequality separately. Not many studies bring up the path of society from mobility toward inequality and fail to discuss the important aspects related to the extent of socio-economic mobility which creates long-term income inequality in a society. Furthermore, the relationship between mobility and long-term inequality has not been examined in the context of Punjab, Pakistan. This study is an attempt to identify the districts of Punjab which are affected by income inequality with or without mobility.

3. Methodology and Data

This study uses base year and final year Gini coefficients and deals with transformation approach as equalising longer-term income which measures the inequality of long-term income as compared to the inequality of first-year income. It provides the extent of the distribution of economic well-being in the long-term as compared to the short-term. The formula of equalising function is given below:

$$E \equiv 1 - G(l) / G(b)^l \dots\dots\dots (1)$$

This study estimates two types of mobility movements along with time dependence. The first type is related to the aspect of changes and is measured by income shares. The second type deals with the position of households in the income distribution. These indices are adequate for defining the comprehensive structure of the society which may explain the two important aspects; whether it is affected by occupation inequality or it is on the track of convergence. All the mobility indices are measured through occupation per capita income. The description of mobility indices is presented in Table 1.

Table 1: The description of mobility indices

Mobility Indices	Equalising and Movement indices of Mobility	Measurement criteria
M_E	Equalising effect	A positive value, $G(l)$ more equally distributed than base-year income, A negative value, $G(l)$ less equally distributed than base year.
M_T	Time dependence	If correlation coefficient is close to 1, it means time dependence is more positive and if correlation coefficient is near to -1, it means time dependence is more negative. $M_T = \text{Cov}(y_f, y_b) / [\sqrt{\text{vary}_f} * \sqrt{\text{vary}_b}]$.
M_p	Positional movement	The measure through household change range of strata. The larger the number of average quintile/strata changes, the more positional movement happened. $M_p = (1/n) \sum_{j=1}^n P_j^f - P_j^b $
M_s	Share movement	The measure through Mean Average, the u_f and u_b are the corresponding share, y_f by $1/u_f$ and y_b by $1/u_b$, obtaining $s(y_f) = y_f/u_f$ and $s(y_b) = y_b/u_b$. $M_s = 1/n \sum_{j=1}^n s(y_f) - s(y_b) $

¹ $G(l)$ is the Gini of long-term income which is the average of current (2017) income and base year (2000) income. While, $G(b)$ is the Gini of base year income.

The primary objective of this study is to measure the direction of mobility (convergence or divergence) in respects of inequality using only one indicator (occupation income). Occupation income more precisely describes the occupation and labour market structure of society in terms of inequality and convergence (or divergence). The positive direction in terms of equality means convergence which shows that the society has achieved greater equality and reduced the stratification gap during a twenty year economic cycle and vice versa. The following model has been used to determine the direction of mobility.

$$\Delta X_{it} = \alpha + \beta X_{it-1} + \mu i \dots \dots \dots (2)$$

Where, ΔX_{it} is dependent variable which shows the change in income (final/base year) and X_{it-1} is independent variable which represents the base year income of households.

The sample from randomly selected six districts of Punjab is taken as a proportion of the population of each district. The sample size of six districts is fixed at 743 households which may provide sufficient results at district level mobility and long-term inequality. The details related to the sample size from each selected district of Punjab is presented in Table 2.

Table 2: Sample Size from selected Districts of Punjab

Districts	Sample size
Lahore	240
Sheikhupura	80
Chiniot	50
Sahiwal	138
Pakpattan	104
D.G. khan	131
Total	743

4. RESULTS AND INTERPRETATIONS

This section presents the effects of mobility on society either equalizing or dis-equalizing long-term income. The three basic concepts of mobility which include time dependence, positional movement and share movement are estimated through household's occupation income. Table 3 presents mobility dis-equalizing/ equalizing long-term income in six districts of Punjab.

Table 3: Mobility as equalizing long-term income of Selected Districts of Punjab

<i>Punjab District</i>	<i>Base year, G_b</i>	<i>Long-term G_{long}</i>	<i>Equalizing long-term income, G_{equa}</i>
<i>Lahore</i>	0.16	0.28	$-0.75G_{long} > G_0$ mobility disequalizing long-term income
<i>Sheikhupura</i>	0.23	0.34	$-0.47G_{long} > G_0$ mobility disequalizing long-term income
<i>D.G. Khan</i>	0.19	0.28	$-0.47G_{long} > G_0$ mobility disequalizing long-term income
<i>Chiniot</i>	0.14	0.19	$-0.3G_{long} > G_0$ mobility disequalizing long-term income
<i>Pakpattan</i>	0.23	0.25	$-0.08G_{long} > G_0$ mobility disequalizing long-term income
<i>Sahiwal</i>	0.31	0.27	$0.14G_{long} > G_0$ mobility equalizing long-term income

Source: Author's own calculation

Table 3 shows that in Lahore district mobility as dis-equalizing long-term income has high intensity with $-0.75 G_{long} > G_0$. The results of Lahore district reveal the presence of more socio-economic opportunities which cause more dis-equalizing long-term income effect among the occupation earnings of households. D.G Khan and Sheikhupura show the intensity of mobility dis-equalizing long-term income of households with Gini-coefficient values as -0.47 in both districts. Chiniot and Pakpattan districts mobility appears as dis-equalizing long-term income by -0.3 and -0.08 respectively. While, Sahiwal district shows equalizing average occupation income of household with Gini-coefficient equal to 0.14 . It may be due to the excessive availability of socio-economic opportunities.

The analysis of mobility as time dependence, positional movement and share movement of six districts of Punjab is presented in Table 4.

Table 4: Mobility as Movement Analysis of Selected Districts of Punjab

<i>Punjab District</i>	M_T	M_P	M_S
<i>Lahore</i>	0.21	0.43	0.49
<i>Chiniot</i>	0.37	0.19	0.21
<i>Sheikhupura</i>	0.42	0.26	0.29
<i>D.G. Khan</i>	0.54	0.11	0.37
<i>Pakpattan</i>	0.36	0.17	0.31
<i>Sahiwal</i>	0.19	0.25	0.29

Source: Author's own calculation

From Table 4 it can be observed that Lahore district has less time dependence i.e. 0.21 and more income share equals to 0.49 . Furthermore, this district shows positional movement of households equal to 0.43 which means that 43% of households changed their socio-economic strata (on the basis of SES index) from base year relative to final year due to the availability of the sufficient opportunities of life chances. While, Chiniot and Sheikhupura have more time

dependence i.e.; 0.37 and 0.42 respectively due to more correlation between base and final year income movement. Which indicates that in both districts, household socio-economic welfare is almost similar to base year with low positional and income share. The households of both districts are still reluctant to avail the socio-economic chances of society which is the major cause of low time dependence (low extent of transformation) and low positional and income share as compared to Lahore.

Both D.G.Khan and Pakpattan districts have more time dependence, less positional movement of household and maximum income share. Both districts show high rigidity because the households from low strata stay in the same position year after year. While, district Sahiwal shows an opposite trend indicating a transformed society with less time dependence, more positional movement and satisfactory amount of income share. In this district there emerges a direct link between mobility and equalizing long-term income. Furthermore this district shows high mobility among the position of particular families in the income hierarchy from year to year.

The direction of mobility in six districts of Punjab is presented in Table 5.

Table 5: Mobility as Convergence/Divergence of Selected Districts of Punjab.

Direction of Mobility	β^{\wedge} value with p-values	R square	Divergence or convergence long-term income
<i>Lahore</i>	3.1 (.000)	0.51	$\beta_{OLS}^{\wedge} > 0$, divergence with positive β
<i>Sheikhupura</i>	2.9 (.000)	0.53	$\beta_{OLS}^{\wedge} > 0$, divergence with positive β but gap of divergence is lower than Lahore
<i>Chiniot</i>	2.2 (.04)	0.26	$\beta_{OLS}^{\wedge} > 0$, divergence with positive β but the intensity is low
<i>D.G. Khan</i>	2.9 (0.000)	0.48	$\beta_{OLS}^{\wedge} > 0$, divergence with high intensity of β
<i>Pakpattan</i>	2.1 (.02)	0.46	$\beta_{OLS}^{\wedge} > 0$, divergence with positive β
<i>Sahiwal</i>	1.3 (.003)	0.26	$\beta_{OLS}^{\wedge} > 0$, divergence with very low intensity of β

Source: Author's own calculation

The significant relationship between income change and initial income (base year income) is dependent on the intra-temporal mobility experienced by households. The positive sign of all β^{\wedge} 's reveal the divergence trend in all the districts of Punjab Lahore, Sheikhupura, Chiniot, D.G. Khan, and Pakpattan district shows a divergence trend between the change in income and initial income with 3.1, 2.9, 2.2, 2.9 and 2.2 respectively, but the intensity of divergence is different in these districts. Sahiwal district has a relatively low divergence trend between initial income and final occupation earning of household due to the equalizing effect of long-term income.

The district wise comparative analysis of all the selected districts in terms of more dis-equalized toward equalized long-term income is presented in Table 6.

Lahore district has more time independence, positional movement, and income share which have become the cause of dis-equalizing long-term income. It shows that Lahore, the biggest city of Punjab province, has provided substantial benefits to job searchers who move from one sector to another sector due to a vast range of opportunities available to them. Furthermore, it can be observed that in Lahore district inequality and mobility move together which verifies that mobility creates long-term inequality.

Table 6: District wise Comparative Analysis of disequalizing or equalizing long-term income,

Highest to least inequality district	Punjab District	Base year, G_0	Long-term G_{long}	Equalizing long-term income, G_{equa}
1	Lahore	0.16	0.28	$-0.75G_{long} > G_0$ mobility disequalizing long-term income
2	D.G. khan	0.19	0.28	$-0.47G_{long} > G_0$ mobility disequalizing long-term income
3	Sheikhupura	0.23	0.34	$-0.47G_{long} > G_0$ mobility disequalizing long-term income
4	Chiniot	0.14	0.19	$-0.3G_{long} > G_0$ mobility disequalizing long-term income
5	Pakpattan	0.23	0.25	$-0.08G_{long} > G_0$ mobility disequalizing long-term income
6	Sahiwal	0.31	0.27	$0.14G_{long} < G_0$ mobility equalizing long-term income

Source: Author's own calculation.

Chiniot and Pakpattan districts have shown low time independence, positional movement, and income share but show a low extent of dis-equalized long-term income. There is low deviation observed in both household's income and socio-economic distribution due to the lack of socio economic vision, poor educational achievements and occupation progression during twenty-year economic cycle. Furthermore, both districts have shown a low extent of positional and income share and low intensity of dis-equalized effect of transformation. Both districts experience low mobility with a low level of inequality which is totally opposite to the notion that mobility creates long-term inequality.

Sheikhupura, and D.G.Khan districts show different scenario as they have low time independence and positional movement while maximum income share which is questionable. It exerts negative impact on the development of society with no trickle-down effect. Both districts have shown a negative relationship between mobility and inequality as both move in opposite direction which indicates that these districts have failed to provide maximum opportunities to lower groups. Furthermore, these districts exhibit quite different relationship

between mobility and inequality indicating that low socio-economic mobility leads to high long-term inequality.

On the other hand, the Sahiwal district creates positive impact of mobility in terms of more time independence, maximum positional movement and maximum income share which means mobility leads to equalizing long-term income due to improvement in household's education level, occupation honor, movement within the country for the sake of a better future and increases in intra-generational assets. This type of mobility is desirable as it promotes economic welfare and shows low dispersion of income within the strata.

5. Conclusion and Recommendations

This study brings up the impact of mobility on long-term inequality in Punjab Province. The results of the study show that mobility generates long-term income inequality among the groups of districts but it is not very harmful due to more positional and time independence, which indicates that opportunities increase the competition in every field. Healthy competition encourages individuals to actively participate in labour markets which basically have become the cause of long-term inequality as some of the households successfully avail the opportunities which leads to dis-equalized long-term inequality. The results of Lahore district show that mobility demands cost more of long-term inequality than in developed districts. In the district of D.G. Khan, socio-economic mobility occurs for upper groups, low positional and income share movement for lower strata. Furthermore, high inequality may be acceptable if opportunities are evenly distributed among the households on merit for achieving social mobility. In well-functioning districts, there emerges positive association between mobility and inequality which provides an incentive to the households to work hard and achieve high socio economic status.

The results of the study show that the distribution of socio-economic resources and opportunities in a society determines the direction of mobility towards convergence or divergence. The society may experience high inequality if its resources are not diverted from ruler to lower strata and the specific groups of society get advantage from their power and occupation prestige. While, on the other hand, inequality may further increase if income of disadvantaged groups remain stationary with no significant changes in their living standard and other socio economic indicators. As a result inequality may have a negative impact on the growth of society. The current agitation and strikes against the present Government of Pakistan bares witness to rising inequality along with increasing occupational discrimination which needs to be tackled on a priority basis. The study suggests that the structure of Punjab Province should be pro-poor with access to equal opportunities in the labour market. This may bring positive changes in the life of households particularly from lower and struggling strata. This calls for the need to formulate and implement appropriate policies which ensure equal opportunities to all the households in the society.



The major limitation of this study is that due to the paucity of resources its analysis is based on the limited data set taken from only six selected districts of Punjab province. Furthermore, the study does not analyse the impact of mobility on the changes in the consumption pattern of households. The research work related to mobility and income inequality can be extend keeping in view the above mentioned limitations of the study.

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