INTERGENERATIONAL MOBILITY IN EDUCATIONAL AND OCCUPATIONAL STATUS: EVIDENCE FROM HOUSEHOLDS OF PAKISTAN

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ISLAMABAD

SCHOOL OF ECONOMICS

QUAID-I-AZAM UNIVERSITY, ISLAMABAD

2018

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Submitted in partial fulfillment of the requirements for the
Doctor of Philosophy in Economics
at the School of Economics, Faculty of Social Sciences,
Quaid-i-Azam University, Islamabad
2018

Dedicated To

My Beloved Parents

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I solemnly declare that research work presented in the thesis titled "***Intergenerational Mobility in Educational and Occupational Status: Evidence from Households of Pakistan***" is solely my research work with no significant contribution from any other person. Small contribution/help wherever taken has been duly acknowledged and that complete thesis has been written by me.

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No part of this thesis has been submitted anywhere else for any other degree. This thesis is submitted to the School of Economics, Quaid-I-Azam University, in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the field of Economics, School of Economics, Quaid-I-Azam University, Islamabad.

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Acknowledgment

Thanks to Almighty Allah, the Compassionate and Merciful, Who bestowed on me the potential and ability to complete this doctoral research work. My special thanks and acknowledgments go to my parents and family for all their love, support and encouragement. I pay my homage and sweet sensation of respect to my loving parents whose love and encouragement kept me stood fast and enabled me to attain this target. I would like to thank all my family, especially to my elder brother Niaz Muhammad, who supported me in all my pursuits and provide me an environment where I could concentrate on my research work. I express my gratitude to my affectionate better half whose affection, prays and encouragement have been a source of courage and determination in completion of this task.

Thanks to my children: Abdul Majid, Sobia, Abdul Wajid and Abdul Bais for always making me smile and for understanding on those weekend mornings when I was writing this thesis instead of spending times with them. I hope that one day they can read this thesis and understand why I spent so much time in front of my computer. Special thanks to my little kid Muhammad Hanan, for being there for me at the end of the day. Your love is what has gotten me through when I wanted to give up. Thanks my children. You have made me stronger, better and more fulfilled than I could have ever imagined. I love you all to the moon and back. You are the pride and joy of my life. I appreciate all your patience and support during my Ph.D. studies.

I would also like to express my deepest appreciation to my respectable and learned supervisor Dr. Muhammad Jamil for his extended guidance, accommodating attitude, patience, motivation and continuous support which led my work to a presentable form. I am thankful and appreciate all his contributions of time and productive ideas which helped me a lot in the completion of this Ph.D. work. Without his precious support this dissertation would not have been possible. Besides my supervisor, I owe an enormous debt of gratitude to Dr. Eatzaz Ahmad, for his continuous guidance and help. I would not be able to complete my work without his unconditional help and cooperation.

I acknowledge with thanks the contributions of all my honorable teachers I happened to learn from throughout my academic career. I also express my heartiest gratitude to all faculty members of School of Economics, Quaid-i-Azam University Islamabad for their insightful comments and encouragement. I am thankful to Dr. Muhammad Idress, Chairman School of Economics, for his supportive attitude in administrative matters as well as for his inspiration throughout Ph.D. period. I am also grateful to Dr. Abdul Jalil, Dr. Wasim Shahid Malik, Dr. Javed Iqbal, Dr. Anwar Shah, Dr. Amanat Ali and Dr. Faiz ur Rehman for their extended encouragement, support and help.

I am indebted and express my special and heartiest thanks to Dr. Sajid Amin Javed, SDPI Islamabad, for his valuable assistance and help in this research work which contributed a lot. Special thanks to Dr. Shabib Haider, Dr. Ghulam Shabbir and Chaudhary Zaheer Abbas, wonderful fellows and colleagues, for their valuable contributions and help. I am

also gratified to acknowledge help and motivation extended by my students Dr. Zahoor Khan, Jalib Sikandar, Zohaib Akhtar and Umer Riaz.

I would like to extend my special thanks to staff of School of Economics especially Sajid Mehboob and Muhammad Asif for their valuable assistance and help in all the issues and matters related to their offices.

Malik Muhammad

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List of Abbreviations

AFW	Skilled Agriculture and Fishery Workers
BHPS	British Household Panel Survey
CHNS	China Health and Nutrition Survey
CLK	Clerk
CRW	Craft and Related Trades Workers
DLHS	District Level Household Survey
ELT	Elementary
EU-SILC	European Union Survey on Income and Living Conditions
GRD	Graduate
GSS	General Social Survey
HDR	Human Development Report
IHDS	Indian Human Development Survey
INT	Intermediate
IRA	Intergenerational Rank Association
JLMPS	Jordanian Labor Market Panel Survey
LFS	Labor Force Survey
LNU	Level of Living Survey
LSMS	Living Standard Measurements Study
OBC	Other Backward Casts
OCG	Occupational Change Generational
MDL	Middle
MFLS	Malaysian Family Life Survey
MGR	Managers
MTC	Matric
NAS	Never Attend School
NELS	National Educational Longitudinal Studies
NLSS	Nepal Living Standard Survey
NSS	National Sample Survey
NSSO	National Sample Survey Organization
OCG	Occupational Changes in a Generation
PGR	Post Graduate
PMO	Plant and Machine Operators and Assemblers
PMY	Primary
PNAD	Pesquisa Nacional por Amonstra de Domicilios
PPHS	Pakistan Panel Household Survey
PRF	Professionals
PSCO	Pakistan Standard Classification of Occupations
PSID	Panel Study of Income Dynamics
PSLM	Pakistan Social and Living Standards Measurement
SC	Scheduled Casts
SHIW	Survey on Household Income and Wealth
SIPP	Survey of Income and Program Participation
SSA	Social Security Administration

SSW	Service Workers and Shop and Market Sale Workers
STs	Scheduled Tribes
SVHS	Sargodha Village and Household Survey
TAP	Technicians and Associate Professionals
VLSS	Vietnam Living Standard Survey

Abstract

Persistence in socio-economic status causes inequalities in opportunities. In such a society poor not only remain underdeveloped but their talent and skills are also wasted or misallocated. As a result, both parental as well as children generations experience backwardness. On the other hand, in a highly mobile society, poor and rich have equal chances of success and failure. Their incentives to work hard increase which lead to enhance innovations and economic growth. This study uses level of education and occupation, non-monetary measures, as proxies for socio-economic status and investigates their mobility across the generations in Pakistan. We utilize data set, the Pakistan Social and Living Standards Measurements (PSLM-2012-13) for our analysis. In first step of our analysis, we examine educational and occupational structure and explore that majority of the fathers and sons are uneducated or less educated and are engaged in lower status occupations in all the regions throughout the country. In the second step of our analysis, we use both transition matrices and multinomial logit model to find out the strength of mobility in educational and occupational status. Our results indicate strong linkages between educational/occupational status of fathers and their sons. Chances for the sons of less educated fathers are very limited to attain high levels of education relative to the sons of high educated fathers. We also find negative impacts of family size on attainments of high levels of education. Results also show a strong persistence in occupational status. This persistence is stronger in the higher status occupations in urban regions while persistence is stronger in the lower status occupations in rural regions. Opportunities are not equal for rich and poor as there are limited chances for the sons whose fathers are in lower status occupations to move to the higher status occupations as compared to those whose fathers are in high status occupations. Moreover, while sons of "Clerks" are more mobile towards higher status occupations in urban regions, they are more mobile towards the lower status occupations in the rural regions. Similarly, more downward mobility is observed for the sons of "Technicians and Associate Professionals" and "Professionals" in the rural regions. Increase in human capital, experience in the job market, income and wealth are found to be important determinants of occupational status of a son.

Chapter 1

INTRODUCTION

1.1 Background of the Study

Increase in inequalities and their persistence is an important issue faced by almost all the countries. Most of the countries across the world experience inequality in opportunities (education and occupation) and outcomes (income, wealth, and consumption). Voluminous theoretical and empirical work has been carried out to estimate inequalities and to find out factors responsible for this phenomenon. Researchers mainly focus on the outcomes of inequality[1]. However, our focus in this study is on equality of opportunities which is considered as a core goal of a society[2]. This is more important because we cannot solve the problem of inequality in outcomes unless we identify inequality in opportunities. The central idea of the equality of opportunities is that adult children belonging to poor families should have the same opportunities for success as those belonging to rich families.

[1]Among others, Alauddin (1975) Ahmed and Ludlow (1989) Anwar (2004) Asad and Ahmad (2011) focus on consumption inequality, Ercelawn (1988) focus on Inequality in income and expenditure, Kaldor (1956), Alesina and Rodrick (1994), Deininger and Squire (1998), Li and Zou (1998), Goudie and Ladd (1999), (Forbes (2000) examine relationship between inequality and growth, Ali and Tahir (1999), Kakwani (2004), Saboor (2004), Cheema and Sial (2012) study relationship between inequality, poverty and growth.

[2]In opinion poll, conducted in US in March 2009, majority of the respondents consider the equality of opportunity more important than the equality of outcomes. In this opinion poll, individuals were asked that whether it was more important to reduce inequality in America or to ensure that every individual has a fair chance of improving his economic position. 71 percent of the individuals replied that ensuring fair chance to everyone was more important while only 21 percent favored reducing inequality (Breen, 2010).

Due to different forms of discrimination (e.g. racism, sexism, marginalization etc.), some specific social classes are excluded from the process of capability formation and income earning opportunities. As a result, both current and future generations experience backwardness, deprivation and increases in poverty. On one hand, the poor are likely to be excluded from wider participation in income generating activities within the society because of their relatively weak financial position. On the other hand, because of their low level of income poor are excluded from the opportunities of capability formation which renders them poorly endowed in terms of human capital and therefore reduces the income of next generation.

The role of family has long been recognized by economists in determining the intergenerational mobility in socio-economic status and inequality. For example according to Knight (1935) family is the key social institution that raises inequality in income through their behavior which produces links between the parental and children wealth[3]. Economists increasingly take their interest in the issue of inequality in income among families across the generations and attempted to estimate intergenerational income elasticity[4] after the notable contributions by Becker and Tomes (1979; 1986) and Loury (1981). A high value of intergenerational income elasticity means low mobility and high persistence and vice versa. An ample research work has been carried out to find the strength of intergenerational mobility via income elasticity and produced diverse results across the regions and across the times. Important among these are studies by Atkinson (1981), Solon (1992), Blanden (2005), Mazumder (2005), Piraino (2006), Dahl and

[3] See Parsons (1978) for more detail on the role of family in income inequality.
[4] A coefficient of log income of parent in regression where log income of a child is taken as dependent variable.

DeLeire (2008), Murtazashvili (2012), Blanden and Macmillan (2014) and Heidrich (2015).

As earnings suffer from various problems, like measurement error, life cycle biasness, transitory fluctuation, etc., researchers recently focus on educational attainments and occupational status as proxies for socio economic status. Education is less likely to expose to measurement errors and unlikely to bias estimation by life cycle bias as most of the individuals complete their education by early or mid-twenties. Moreover, there is a vast literature (for example Solon et al., 1994; Blanden, 2009; Black and Devereux, 2011; Currie and Almond, 2011 etc.), which shows that higher education is not only associated with higher earnings but it also leads to better health and other economic outcomes. Therefore, education is a reasonable proxy to measure mobility of overall socio economic status. Studies like Mare (1980), Lillard and Willis (1994), Hausman and Szekely (1999), Behrman et al. (1998), Dahan and Gaviria (2001), Behrman et al. (2001), Spielaure (2004), Hertz et al. (2007), Holmlund (2008), Chevalier et al. (2009), Doorn et al. (2011), Assad and Saleh (2013), Azam and Bhatt (2015), Borkotoky et al. (2015) etc. use education as a proxy for socio-economic status in order to assess intergenerational mobility.

Occupation is another proxy that is used for intergenerational mobility of socio-economic status. Occupational status represents the income as well as power status of the individuals. Moreover, occupational status answers the questions like, how income is earned in that particular occupation. How much mental and physical efforts are required and what is the resultant outcome, i.e., the income earned? One can easily gauge the socio economic status of an individual by looking at his occupation. Studies including

Duncan and Hodge (1963), Blau and Duncan (1967), Ganzeboom et al. (1989), Erikson and Goldthorpe (1992), Sjogren (2000), Ermisch and Francesconi (2002), Beller and Hout (2006), Emran and Shilpi (2011), Zijdeman (2008), Van Bavel et al. (2011), Hnatkovskay et al. (2012), Motiram and Singh (2012), Long and Ferrie (2013), Schwenkenberg (2013), Raitano and Vona (2015), Tiwari (2016), etc., find a significant relationship between parental occupational status and occupational status of their children.

To find the strength of intergenerational mobility in educational and occupational status, the researchers most often followed three methods: (1) computation of transition matrices; (2) correlation analysis; and (3) regression analysis. In a transition matrix, the chances of relative positions of the children are found given the positions of their fathers/mothers. Looking at the diagonal and off diagonals values of the matrix, one can assess the strength of persistence, upward mobility and downward mobility in educational and occupational status. However, there are at least two inherent problems with the transition matrix. First, it suffers from the problem of floors and ceilings effects; that is less mobility can be observed for bottom and top categories. Secondly, it computes relative probabilities of children on the basis of status of parents only and ignores the impact of other relevant variables on the status attainment of the children. Studies using this method include Cheng and Dai (1995), Biblarz et al. (1996), Behrman et al. (2001), Erikson and Goldthorpe (2002), Louw et al. (2006), Beller and Hout (2006), Girdwood and Leibbrandt (2009), Majumder (2010), Motiram and Singh (2012) and Javed and Irfan (2015).

Correlation analysis is another method used to assess intergenerational mobility. In this method, we find that how strongly the characteristics, education/occupation, of the children are correlated with the characteristics of their parents. However, like transition matrix, this method also ignores the importance of other variables in the achievement of educational and occupational status. Havinga et al. (1986), Ermisch and Francesconi (2002), Beller and Hout (2006), Hertz et al. (2007), Hellerstein and Morrill (2011) and Azam and Bhatt (2015) used correlation method in their research works in order to estimate the strength of intergenerational mobility in education/occupation.

Regression analysis is another method, which is used to find the relationship between educational/occupational status of children and that of their parents. It is more appropriate method which establishes the causal relationship between the characteristics of children and parents along with other important determinants. Duncan and Hodge (1963), Blau and Duncan (1967) (uses path model), Sjogren (2000), Nguyen and Getinet (2003), Hertz et al. (2007), Zijdeman (2008), Holmlund (2008), Girdwood and Leibbrandt (2009), Emran and Shilpi (2011), and Van Bavel et al. (2011) utilized regression analysis in their studies to estimate mobility in educational/occupational status across the generations.

First, we will use descriptive statistics to find out the structure of educational and occupational status. Then, we will use transition matrices and regression analysis to assess intergenerational mobility in educational and occupational status. On the basis of transition matrices, we would compute percentages of upward mobility, downward mobility and immobility (persistence) of educational and occupational status for overall Pakistan, rural and urban regions of Pakistan, provinces and rural and urban regions of all

provinces. Moreover, we will also compute probabilities of sons' characteristics (educational and occupational status) given the characteristics of their fathers for all the regions. However, to evaluate the impacts of other relevant variables on educational and occupational attainments by a son, we will use regression analysis. As levels of education and occupations are divided into different categories, therefore, we will use categorical logit estimation method in our regression analysis.

Methodologically, the most relevant to our study are the works done by Nguyen and Getinet (2003) and Girdwood and Leibbrandt (2009). However, our method of estimation is different from these studies in two aspects. First, while Nguyen and Getinet (2003) and Girdwood and Leibbrandt (2009) divide occupations into five and four categories respectively, we divide occupations into nine categories using Pakistan Standard Classification of Occupations (PSCO-94). Secondly, Nguyen and Getinet (2003) and Girdwood and Leibbrandt (2009) use ordered logit model without testing its statistical validity. We use multinomial logit model after rejecting ordered logit model on the basis of Brant test of proportional odds ratio.

We will use more comprehensive and well represented data as compared to the earlier studies conducted on intergenerational mobility for Pakistan. Havinga et al. (1986) uses data of 1200 individuals collected from 10 major industrialized cities in their analysis. Study by Cheema and Naseer (2013) is confined to the rural region of district Sargodha, Pakistan. Javed and Irfan (2015) used data of Pakistan Panel Household Survey (PPHS) which covers only sixteen districts and ignores all the big cities. In contrast, we will use the most representative and comprehensive data of Pakistan Social

and Living Standards Measurement (PSLM) 2012-13[5] in our analysis. It contains information on 492632 individuals belonging to 75516 households collected from all the districts across the country. Moreover, unlike Javed and Arif (2015), we will also consider the importance of other relevant variables in our categorical regression analysis along with the transition matrices.

1.2 Significance, Scope and Limitations of the Study

Accelerating the pace of economic growth, eradication of poverty and reducing inequality are the hard issues and main concerns of policy makers throughout the world and particularly in Pakistan. Growth rate of Pakistan remained below the other competitors in the region like India, China, Srilanka and Bangladesh over the past few years. Its per capita income at 2011 PPP dollar is only 4454 dollars per annum, far below the top ranking country Qatar with per capita income of 127562 dollar, and carries rank of 132nd out of 188 countries (Human Development Report (HDR) 2015)[6]. Pakistan ranked as 70th out of 101 countries with multidimensional poverty of 45.5%. Out of this, 26.5% of the population is living in severe poverty. 22.3% of the population is living below the national poverty line while 12.6% of the population is earning less than 1.25 dollar a day.

Human capital plays an important role in the process of production and income generation. Countries with high quality of human capital are more productive, innovative and energetic to produce enough to help the country in providing all the necessities of life. However, Pakistan ranked as 147th with value 0.538 of Human Development Index (HDR, 2015). Adult literacy rate[7] is 54.7% and its ranking was 131th out of 150 countries

[5] Comprehensive discussion and details on PSLM survey are given in chapter 5.
[6] India has 5328 dollar with rank 124th, and Bangladesh has only 2853 $ per capita with rank 148th.
[7] According to Labor Force Survey of 2013-14, literacy rate in Pakistan is 60%.

for the year 2013. Average year of schooling is only 4.7 years, which gives 150th position, out of 188, to Pakistan in the world ranking. Only 10.4% of the population has level of education above matric (Labour Force Survey (LFS), 2013-14)[8]. Inequality in education in Pakistan is 44.4%, far larger than the average inequality of world (26.8%) and spends only 2.5% of GDP on education which is among the lowest expenditure on education incurred by the governments in the world[9]. Employment to population ratio is among the lowest (51.6%) of the world. Only 54.4% of the labor force participates in the job market in Pakistan and ranked as 135th out of 179 countries. Majority (90.9%) of the individuals are engaged in the lower status occupations (LFS 2013-14). Out of these 16.1% are service and sales workers, 37.8% are skilled agricultural, forestry and fishery workers and 15.8% are engaged in elementary occupations.

Different policy measures have been taken by different governments in the past to cope with these economic issues but still Pakistan faces low economic growth, higher poverty and more inequalities. Most of the researchers and policy makers focus at the macro dimensions of these indicators. For example, what are the determinants of economic growth and inequality? Which factor is more important and which one is least important? However, there is almost silence in the literature regarding the issue of inequality in opportunity via educational and occupational mobility. There is an increasing role of human capital in the economic growth which in turn affects fertility and mortality (Meltzer, 1992). Decision about fertility and education of children depends on the preferences and constraints faced by the parents. This provides a strong basis for the role of family in the transmission of human capital in the theories of intergenerational

[8] LFS is conducted by Pakistan Bureau of Statistics, Government of Pakistan.
[9] These figures are for year 2014 (HDR, 2015).

mobility[10]. Intergenerational mobility is a fundamental issue for assessing poverty, inequality and economic growth of a society. Do the children achieve social status that is similar to the status of their parents? Do they possess better education and enjoy a better occupation? Does this intergenerational mobility provide equal chances to everyone and everywhere in the country? Answers to these questions are worthwhile to be explored.

In the present study our focus is on intergenerational mobility in educational and occupational status with reference to Pakistan. Mobility is desirable because it ensures the placement of individuals in a society according to their competence rather than social origin (Hout, 1988). Persistence in socio-economic status would mean that a child born in a poor family is unlikely to escape his start position in life and as a result inequality will continue in the next generation. This will lead to economic inefficiency since talented individuals from the poor families will remain under-developed and will not be fully utilized. In this perspective, government should not only finance and provide education to everyone but also ensure the policy of merit in order to equalize the opportunities. However, if opportunities for the children are based in and transmitted from the home, then reliance upon the education system or job market to promote integrative goals may be an overly optimistic strategy. In this case, institutional reforms and behavioral changes would be required to improve the socio-economic status of the current generation.

The economic rationale to remove obstacles in intergenerational mobility is two-fold. First, human skills (learnt abilities) and talents (innate abilities) are more likely to be wasted or misallocated in societies where mobility is very low. Second, lack of equal opportunity may affect the motivation and effort of the individuals. Less motivated and

[10] See for example Becker and Tomes 1976, 1979, 1984 for detail discussion of altruism and role of families in the educational investment of children

effortless citizens are less productive. In this way, the overall efficiency and growth potential of the economy is adversely affected. After identifying disadvantageous classes, correct policy measures could be taken to increase mobility of these groups. It may help these specific groups to increase their share in overall income, reduce poverty and enhance economic growth. The study of educational and occupational mobility can help the policy makers to pinpoint and focus on the regions and groups of individuals who are unable to move from lower to a higher status.

Due to nature of the data, our analysis is limited to "co-resident father-son" only. Most of the females leave the house of parents after marriage. Therefore limited observations of co-resident father-daughter are available, especially, for age more than 25 years. Moreover, the number of educated females, especially in high level of education, is very low. Only 15.74% of the mothers attended school and remaining 84.36% never went to school. Similarly, only limited data on working female are available. Further, majority of the working females (81.22% of the mothers) are related to low status occupations like agricultural workers and craft industry. Due to these reasons our analysis is limited to only co-resident father-son data only

1.3 Research gap and Research questions

It is evident from the literature cited in chapter-3 that there is plethora of research work at international level, both for developed and underdeveloped countries; yet the area has not been focused upon in Pakistan economic research. There is a dearth of mobility literature in Pakistan. This is quite astonishing although the problems of social exclusion, income inequality, poverty and low economic growth have been quite substantial in Pakistan. So far the researchers have focused upon a particular "outcome" variable (e.g. income,

consumption expenditure, or wealth) and concluded how inequality in this variable has changed over time. However, none of the researchers has focused comprehensively on the issue of intergenerational mobility in the context of Pakistan.

Pakistan comprises four provinces, Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan where income, educational and occupational distributions are not same. Especially Balochistan is more backward relative to the other three provinces in all three (income, education and occupation) aspects of social and economic status. Similarly, urban population is more advanced in all three aspects as compared to rural population. Different policy actions have been taken for development and poverty eradication in different provinces and regions. How far such actions have been successful in creating greater mobility among the excluded classes and bringing about in higher social flexibility in the nation as a whole remains an important area to be explored.

The present study will try to fill in this void in the existing literature by exploring not only the level of educational attainment and occupational structure in different regions of Pakistan but also the degree of educational and occupational mobility in these regions. Consequently, research questions resulting from this context are:

- Are the fathers with lower socio-economic status (less educated or having low status occupations) able to help their sons to gain social promotion? Or by contrast, are the fathers with high socio-economic status (more educated or having high status occupations) transmit the same high socio-economic status to the next generation?
- Are the patterns of intergenerational mobility of educational and occupational status same across the regions?

- Is educational mobility being transmitted adequately into occupational mobility?

With this background, we will try to determine level of educational attainment and occupational structure of sons and fathers in Pakistan. The same will be explored in urban-rural regions as well as in all four provinces separately. After examining the educational and occupational structure of both generations, we will then investigate mobility across the generations. This will help us to explore the regions as well as the social classes in terms of strength (weak or strong) of mobility. After finding educational and occupational mobility, we will be able to examine how adequately educational mobility is being transformed into occupational mobility.

Besides, we will also explore the importance of other socio-economic variables related to social status of individuals. Specifically the impact of family background in terms of income and wealth, role of experience and human capital on the status attainment of a son will be examined. Similarly, to examine resource dilute hypothesis, we will examine the effect of family size on the socio-economic status of a son.

1.4 Plan of the Study

This study explores intergenerational mobility in socio-economic status in Pakistan. Instead of income, our focus is on the attainments of educational and occupational status of sons and fathers. While the existing literature on the topic mostly uses transition matrices to find the link between educational/occupational status of sons and their fathers, we also use marginal effects derived from Multinomial logit estimates along with transition matrices. This will help us to examine the strength of other socio-economic variables on the status attainments of the sons' generation. Rest of the study is organized as follows:

Chapter 2 provides detailed discussion on meaning of intergenerational mobility and measurement of the socio-economic status. Three measures of socio-economic status namely income, education and occupation are discussed in detail along with their advantages and disadvantages. Moreover, we also discuss different mechanism through which social status of the fathers transmit to their sons.

In chapter 3 we review the literature related to intergenerational mobility. This chapter covers empirical research related to all three measures of socio-economic status. Though our study is confined to educational and occupational mobility only but the importance of income mobility cannot be neglected in understanding socio-economic mobility, therefore we present past empirical research related to income mobility along with the educational and occupational mobility.

Theoretical models related to educational mobility and occupational mobility are discussed in chapter 4. For the educational mobility, we utilize models developed by Becker and Tomes (1979, 1986), Loury (1981) and Becker et al. (2015) while for occupational mobility, we extended model of Emran and Shilpi (2011). Unlike Emran and Shilpi (2011), who use only two categories of occupations the agriculture and non-agriculture, we extended our model to nine broad categories of occupations. Moreover, our empirical specifications of both the models are different from the original models by incorporating family background variables, characteristics of the sons and geographic variables. This chapter also discusses methods of estimation i.e. transition matrix, ordered logit and multinomial logit.

Chapter 5 presents detail discussion on data and construction of variables. Empirical results and their discussion are given in chapter 6. First we measure

educational status through descriptive statistics and its mobility through transition matrices and multinomial logit estimation then we use the same tools for assessing occupational structure and its mobility. Finally, chapter 7 concludes the study with furnishing summary of the research findings and their policy implications.

Chapter 2

SOCIO-ECONOMIC STATUS: MEASUREMENT AND ITS TRANSMISSION MECHANISMS

2.1 Introduction

This chapter summarizes the discussions on meanings and concepts related to intergenerational mobility in socio-economic status. A detailed and comprehensive discussion on the measurement of socio-economic status and its transmission mechanism from parents to their children is provided. Different channels of transmission mechanism, supported by empirical studies, are elucidated. The chapter is organized as under:

Section 2.2 focuses on three measures of socio-economic status, namely income, education and occupation. Issues related to income as a proxy of socio-economic status are also discussed in detail in this section. Section 2.3 explains the meaning and role of intergenerational mobility. Section 2.4 elucidates on different transmission mechanisms of socio-economic status. It explains the role of family, environment, genes and assortative mating in the transmission of socio-economic status. Section 2.5 summarizes the chapter.

2.2 Socio-economic Status and its Measurement

Socio-economic status is the social standing of an individual or the class to which he/she belongs. It is the integrated economic and sociological measure of work experience of an individual that defines his/her economic and social position in relation

to others. Socio-economic status of an individual can be judged through different measures of labor market characteristics such as income, level of education and nature of occupation of an individual. Most widely, the economists use income as a proxy for socio-economic status. However, income is suffering from a number of problems. It is influenced by time and cycles. It is also affected by individual as well as by aggregated temporary shocks. Moreover, income significantly varies over the life cycle and the patterns of income observed in life-cycle also vary from generation to generation. So it becomes quite difficult to find a link between incomes of the parents with those of their children in order to evaluate the strength of intergenerational mobility of socio-economic status.

While studying mobility, we have to depend on survey data collected at household level in which individuals report their current income. However, as mentioned by Friedman (1957), it is the permanent income which determines the consumption and welfare of an individual. Therefore, the association should be established between permanent incomes of the two generations in order to assess intergenerational mobility in income. Unfortunately in most of the available data information or prediction about the permanent income is not available[11]. Therefore, the measurement error in the form of transitory fluctuations and errors from one year to next year, especially in the earning of parent which is used as an explanatory variable, cause usually downward bias and lead to inconsistent estimates (Altonji & Dunn, 1991; Zimmerman, 1992; Solon, 1992). To handle the problem of measurement error in income variable, researchers like Solon (1992), Mazumder (2005b), Dahl and DeLeire (2008), etc., use average earnings as a

[11] In some countries like US, Scandinavian countries and Canada etc. data contain information over extended years for both sons and fathers generations.

proxy for permanent income. It is shown that biasedness decreases with the increase in number of averaged years (Solon, 1992; Mazumder, 2005b; Blanden, 2005).

Taking averages, however, may lead to further biasedness if variance of the transitory component of earnings is not constant over the life cycle. A study by Baker and Solon (2003) shows that fluctuation in transitory income exhibit U-shaped pattern in the different stages of life of an individual. It decreases in the early stage of life of an individual, reaches minimum level and then increases. Therefore, using averages as proxy for permanent income, lead to further biasedness. They suggest that fluctuations are minimum at the age of 40 years of individual; therefore measuring earnings at that age will minimize the bias.

Moreover, due to diverse age-earnings profiles, the association between lifetime earnings and current income is not stable over the lifecycle of individuals which leads to lifecycle bias in the measurement of earnings profiles. The growth of earnings is flatter for those individuals whose lifetime earnings are low as compared to those who have high lifetime earnings. The earnings gap that is observed in the early ages of high and low earners leads to underestimate the gap in life time earnings. Therefore, age of children and parents are important for getting unbiased estimates of earning elasticity (Jenkins, 1987; Solon, 1992; Haider & Solon, 2006; Mazumder, 2008). This problem of life time bias can be handled by using the parental income and income of the children at the same age (Blanden, 2005). Haider and Solon (2006) find in their study for US that relationship between current and permanent income should be measured at the age of early 30s and mid 40s of an individual in order to minimize lifecycle bias in earning variable.

Methodologically, researchers propose instrumental variable method to address the problem of measurement error in the earnings of father. However, finding a valid instrument (which is highly correlated to earnings of father and uncorrelated to measurement) is a difficult task in the cross sectional studies. Zimmerman (1992), Nicoletti and Ermisch (2007) and Nunez and Miranada (2010) used occupational status as an instrument, Bjorklund and Jantti (1997) used city of residence of the sons, Aaronson and Mazumder (2008) used state of birth and Javed and Irfan (2015) used occupational status, educational level and province of a father as instruments. However, using occupation and education of father and residence of a son, as instruments, violate the assumption of exclusion restriction[12]. Arellano and Meghir (1992), Angrist and Krueger (1992), Bjorklund and Jantti (1997), Dunn (2003), Piraino (2006) and Andrews and Leigh (2009) suggest two sample two stage method[13] for minimizing the lifecycle biasedness. Murtazashvili (2012) suggests random coefficient model and control function[14] to capture family specific characteristics and to cope with the problem of biasedness and inconsistency.

Restricting socio-economic status and its mobility to monetary measures (income) underestimates the influence of family background on inequality (Goldberger, 1989). Educational attainments and occupational status are better correlated with the long term

[12] Occupation of father, education of father and residence of a son are directly related to earnings of a son other than earnings of a father. Exclusion assumption requires that earnings of son should not change with the change in occupation of father, education of father and residence of a son (instrumental variables) given that earnings of a father is held constant.

[13] Two sample two stage method is used when information on father's income is not available and is predicted on the basis of characteristics like experience, education and occupation of father. In this method information of two samples are used. In first step earning equation is estimated for an older sample of men and coefficients of different characteristics like education, occupation and experience are obtained. In the second step coefficients of the first step are utilized to predict earnings of fathers on the basis of characteristics of father reported by the children in the second sample.

[14] Statistical method to correct the problem of endogeneity by modeling endogeneity in the error term.

economic and social status of an individual. Educational attainment and occupational status are highly correlated with earnings and are relatively stable over time (Nickell 1982; Ermish & Francesconi, 2002) and are not subject to year by year fluctuations and to transitory shocks. Moreover, as mentioned by Becker and Tomes (1986) and Mulligan (1999), non-linearity exists in intergenerational income mobility as rich parents are in better position to invest in the human capital of their children than the poor parents. The impact of income of rich parents is different than the impact of income of poor parents on income of their children. Thus different transmission mechanism, may work at different levels of income while intergenerational correlation of income is a single average measure[15]. Using education and occupation as a socio-economic status, we can easily capture the transmission mechanism by different coefficients varying across different educational and occupational categories.

Level of education provides information about the lives of individuals they live in. As compared to earnings, education is less likely exposed to serious measurement errors because people know their own educational level. Similarly, education is free of life cycle bias because most of the individuals complete their education by early or mid-twenties, so life cycle biases are unlikely to bias estimation when compared with earnings. Moreover, plenty of literature (Solon et al., 1994; Blanden, 2009; Black & Devereux, 2011; Currie & Almond, 2011 etc.) shows that higher education is associated with higher earnings[16], better health, longer lifespan and other economic outcomes. Education increases the chances of upward mobility in occupational status as well as the

[15] Researchers use different techniques like spline regression, transition matrices, quintile regression, to capture the effect of non-linearity in intergenerational income mobility.

[16] For example, Machin (2004) finds that after the rapid expansion of post-compulsory education in Britain, the persistence of income has increased over time. The study also shows that education attainments can help to explain income persistence within families across generations.

possibility of upward mobility in income (Burns, 2001). It creates mobility aspirations, socializes an individual for better position and prepares for better work role. Moreover, information regarding level of education of father can be easily provided by the sons without any complications, like in earnings, in the measurement. Therefore, education is a reasonable proxy to measure overall socio-economic status of individuals and mobility of education, therefore, would mean mobility in overall socio-economic status.

Occupation is another variable that can be used as a proxy for socio-economic status. The reason of choosing occupation as a proxy for socio-economic status is that it reflects the lives the people live in. According to Giddens (2009),

> *"Occupation is the most critical factor in an individual's social standing, life chances and level of material comfort...individuals in the same occupation tend to experience similar degrees of social advantage or disadvantage, maintain comparable lifestyles, and share similar opportunities in life". (p. 443).*

Occupation is the intervening activity which links education and earnings (Ducan, 1961) and reflects the indirect effect of education on income. Occupation as a measure of socio-economic status has important advantages over income. Information on occupation can be easily collected. It can be easily recalled and cannot be refused easily. Information revealed regarding occupation is relatively more reliable as compared to income. Further, information about parental occupational status can be easily reported by their adult children. Occupational status of an individual remains stable for a long period of time and provides enough information of long run standing and is better indicator than a single year income measures (Goldberger, 1989)[17].

[17]Though occupation is considered as a weighted average of level of education and earnings, but using occupation as a measure of social status is also not free of error. For example, same occupational status requires more educated women as compared to men and occupational earnings of men exceed the earnings of women (Warren el al., 1998). However, in this study our focus is on male only so we are not exposed to this problem. We only investigate the relationship between occupational status of fathers and their sons for the reasons given in chapter 5.

People get utility from their relative status that they attach to jobs. Those who have high ranked and prestigious jobs are more satisfied; and usually have higher income, the best education and the most of the power. According to sociologists, job or work is an action that is performed to achieve some particular objective. It has two meanings; first the individual gets some satisfaction of his/her physical and psychological need and second a job may be a game for an individual which provides satisfaction to him/her. However, drawing a dividing line between play and work is not possible. An activity may be a work for an individual but the same may be a game for another individual.

Improvement in occupational status is a sign of improvement in educational attainment and increase in income of the people. It provides opportunity for individuals to raise living standards of their families. But the pattern and strength of improvement in occupational status depends upon policies affecting the educational sector and the occupation seeking. Better education equips an individual with a high human capital which leads to a good and prestigious occupation and a high level of permanent income. On the other hand, persistence and rigidity in occupational status restricts the equal opportunities for the next generation.

Though occupational mobility reflects high income and high educational status of the sons' generation but educational mobility does not necessarily lead to occupational mobility. Therefore only looking at educational mobility and ignoring the occupational mobility would not be helpful in determining the change in socio-economic status of an individual. Therefore, we will examine occupational mobility along with educational mobility in order to assess socio-economic status of sons' generation relative to their fathers.

2.3 Intergenerational Mobility: Meaning and its Implications

Researchers are not only interested in the actual change in socio-economic status but are also attracted by the length of time the change takes to occur in this status. A change in socio-economic position that occurs during lifetime of a person is called intra-generational mobility. On the other hand, a change in socio-economic position that occurs over multiple generations is termed as intergenerational mobility; i.e. a movement of an individual in relation to social and economic position of his/her parents (Mann, 1983). It is the change in positions of individuals within the outcome distribution as well as changes of the distribution.

Intergenerational mobility depends on factors related to family background (income, wealth and educational level of parents), factors related to the inheritability of traits; such as inherent abilities, and factors related to the family and social environment in which the individuals grow up and get married. Children of well-educated and rich parents have better chances to move up the ladder of social status as compared to their counterparts belonging to less educated and poor parents. Similarly the caste status, which is inherited by birth, imposes social restrictions on the traditional assignment of jobs and this is one of the biggest obstacles to social mobility for the poor. The son of a poor, uneducated fisherman is likely to be poor, uneducated fisherman because it is very difficult for him to find employment in other occupations. Hence, the interest of such a person to get education is also limited because a large part of the attraction of acquiring education is mainly in its value in getting jobs. It thus discourages from the beginning to attempt to come out of clutches of deprivation. This links the status of children to the status of parents.

Mobility in socio-economic status is measured by the association of status of children as adults with the status of their parents. If association between socio-economic status of children as adults and parents is strong, then there is immobility or persistence in the socio-economic status. In this case, the same socio-economic status is transmitted to the children generation by the parents. Earnings, education and occupation of a child in a relatively immobile society are likely to be strongly related to those of his/her parent. However, a society can be deemed as more mobile if the association between parental and children's socio-economic status is loose. In this case the status of a child is different from that of his/her parent. Mobility may be in either direction; upward mobility or downward mobility. An upward mobility is a situation where socio-economic status of a child as adult is higher than the corresponding status of his/her parent. On the other hand, in downward mobility the socio-economic status of a child as adult is lower than that of his/her parent. An individual may have the ability to move up in society and become a member of a different social class if he or she is provided the right opportunities and relieved of the constraints. For example getting higher level of education, a high paid occupation, or marrying someone who is relatively rich and wealthy can help an individual to move up the social hierarchy. On the other hand, losing a job, dropping out of school, or being publicly disgraced may cause downward social mobility.

Differences in mobility among the societies lead to different consequences. For example, in highly mobile societies, talents of their members are optimally used and thereby are able to grow faster (Weil, 2009). In a highly mobile society, social conflict can be reduced and more pressures could be put for redistributive policies. Similarly, in a society where rich and poor groups have equal chances of success and failure on the basis

of merit, the incentive to work hard increases (Bourguignon et al., 2007). All these factors accelerate economic growth of a society. On the other hand, a society where social positions of sons are tied to their fathers through stiff and rigid system creates hurdle in innovations at individual as well as at collective level and restricts equal opportunities (Bourdieu et al., 2009). In such societies, poor are not only under developed but their talents and skills are also under-utilized or mostly wasted.

Family background cannot be ruled out in the status attainment of a child. Rich families invest more in education and human capital of their children and are able to get high status occupations and earn more income (Solon et al., 2004). Observing perfect mobility would mean "no return" to human capital. Similarly, genetic differences in ability also cause intergenerational persistence in education, occupation and income status. Both of these factors cause intergenerational persistence in socio-economic status. Increasing intergenerational mobility by compelling the employers to favor less qualified individuals in terms of employment or in terms of payment would be more costly to society by creating inefficiency and reducing incentive to accumulate human capital. However, on the other hand, inefficiency in economy will also arise if children of rich families use connections to get high status jobs even in the presence of better qualified poor children. The intergenerational persistence due to this nepotism is harmful to society. This type of discrimination would lock the people into long-term poverty gaps and inequalities between poor and rich would not only affect the current generation but also the future generation.

Intergenerational mobility may be an absolute mobility or relative mobility. Absolute mobility is the observed amount of movement from one category into another.

It represents the percentage of children reaching lower/higher socio-economic status than their parents. It compares the socio-economic status (income or education or occupation) of a child with the socio-economic status of his/her parent. For example if inflation adjusted annual income of a child is Rs. 150000 and the annual income of his/her parent was Rs. 120000 at a comparable point in life, he/she has experienced upward intergenerational absolute mobility in income.

Absolute mobility can be divided into two dimensions. The first one, also called structural mobility, is the transformation of class structure over time due to exogenous demographic and economic factors such as economic policy, technological change, fertility, foreign trade and immigration (Hout, 1988). For example transformation of an economy from agriculture to industrial and services sectors upgrades the national class structure which makes a room for top ranked occupations like "professionals" and "non-manual works" and reduces positions in low ranked occupation of agriculture. The second dimension also called relative mobility is the association between origins and destinations, net of structural change. If this association is strong then class of origins determines to a large extent what a person becomes in life. On the other hand a weak association indicates that destination is largely independent from origins. If, for example, government policies become more pro education and emphasis more on education[18] this will change the educational structure and thus educational distribution will move upward due to increase in overall level of education in the society. Similarly, the possibility in low ranked occupations (farmers, elementary occupations etc.) declines as the proportion of individuals in these occupations decreases, whereas the opportunity in high status

[18] Policies like early enrolment, compulsory education in a prescribe age, subsidizing and providing scholarships, increasing supply of educational institutions, increasing in rewards to education etc.

occupations (doctors, lawyers, engineers etc.) may increase, without any changes in the proportion of these "professional" in the society, as more and more people have access to education. Moreover, the prevalence could change if economic growth stimulates a shift in employment from low status occupations to high status occupations. Similarly an upward shift may occur in the distribution of education when people, as a whole, show more interest (either because of government policies or because of increase in reward to education) in getting education. These structural changes may alter the association between status of children and their parents[19]. Relative mobility is adjusting for these differences in distributions of socio-economic status (occupational, educational, income etc.) in measuring mobility estimates.

Similarly, relative mobility of income measures how ranking of a child in the income distribution is compared to the ranking of his/her parents. If parents were in the bottom quintile and their children move into the second quintile, then the children have experienced relative mobility. To make clear difference between absolute and relative mobility, let reconsider the example. Suppose father was in the bottom quintile with his annual income of Rs.120000. If his son makes Rs.150000 a year but stays in the bottom quintile, it means son has experienced absolute mobility but no relative mobility.

2.4 Mechanism of Intergenerational Mobility

There are a number of channels through which socio-economic status of parents are transmitted to their children. These channels of intergenerational linkages are discussed in the subsections 2.4.1, 2.4.2, 2.4.3 and 2.4.4.

[19] education, skills, organizations, social networks may improves the chance for some groups (sons of farmers) moving into an occupation (white collar jobs) by more than it improved the chances of others moving into the same occupation (sons of white collar workers moving into white collar jobs themselves)

2.4.1 Family Transmission Models

Family plays an important role in the attainment of socio-economic status and its transmission. Parents care about the future income of their children and invest in their education to increase their level of human capital. This provides the basis to explain intergenerational mobility through families. Models developed by Becker and Tomes (1979) and Loury (1981) are the examples of classical intergenerational mobility models. Parents neither demand nor legally force their children to pay back the educational expenditure incurred on them. Higher the level of parental income higher will be the level of investment on education of children. Therefore the level of parental income primarily determines the level of education and human capital of their children. Human capital in the form of education along with ability and labor market luck, determine the income of children. So there exists a causal relationship between parental income and income of a child. In addition to human capital (in the form of education), family income is also linked to "health capital". Maternal health influences health of a child which in turn determines his human capital formation (Currie & Almond, 2011) called "The Fetal Origins" hypothesis in the literature. As parental income determines parental health, therefore, persistence in health status is the source of the transmission of income status.

Apart from the human capital formation, family background also plays an important role in developing cognitive skills and non-cognitive skills (personality traits)[20], of a child. Heckman (2008) is the pioneer research study which focuses on the

[20] "The big five" of psychology, openness, conscientiousness, extraversion, agreeableness and neuroticism, are the main personality traits. **Openness** reflects the degree of intellectual curiosity and a preference for novelty. It also shows the extent to which a person is imaginative or independent. **Conscientiousness** is the tendency of an individual to be organized, self-discipline, act dutifully, aim for achievement, and prefer planned. **Extraversion** reflects energy, positive emotions, sociability and the tendency to seek stimulation in the company of others and talkativeness. **Agreeableness** is the tendency of a person to

importance of personality traits in determining socioeconomic success[21]. There is complementarily between cognitive and non-cognitive skills. Better non-cognitive skills help cognitive skills to be more productive. That is, in the language of Heckman (2008), higher stocks of skills help to produce more skills. Bowels et al. (2005), in their study for US, find that increase in cognitive test scores increases earnings directly as well as indirectly through increase in level of education. Though it is true that parental income helps in human capital formation which determines the socio-economic status of a child and any parental credit constraint hinder investment in human capital of children, however, parenting and mentoring comparatively play more important role in the human capital formation of children. Spending more time with children and helping them in solving their home assignments are keys to educational success of children.

2.4.2 Social-level Transmission Models

Collective activities or environments have strong influences on children which promotes intergenerational mobility. There are a number of environmental factors that affect the intergenerational mobility. Among these, some factors such as social norms, work ethics, attitude towards risk and social networks are only loosely related to public policy and very difficult to change directly through the government policies. However, there are some factors which can be affected, to a large extent, by the public policies. For example public policies, such as public support for early childhood, primary, secondary and tertiary education can help in access to education and human capital formation. Similarly, redistributive policies of the government in the form of taxation and transfer

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be sympathetic and co-operative rather than suspicious and aggressive. **Neuroticism** is the degree of emotional stability and impulse control

[21] Borghans et al. (2008) and Almlund et al. (2011) are comprehensive surveys on this topic.

schemes that may reduce or raise financial and other hurdles to accessing higher education. To understand, for example, provision to the children aged between 5 and 17 without direct charge of education is the responsibility of state in US. So the level of education, being a public good, is determined by a political mechanism and depends on the incomes and preferences of the adults in different districts. Parental income determines the type of school a child attends[22] but by the law of state the child must be in school during the above mentioned range of age. Similarly, researchers who link the socio-economic status of a child to his IQ level, show that IQ of a child is not limited to genetics but also depends upon the environment provided to a child. Duyme et al. (1999) show that children[23] adopted by families with high socio-economic status gained more cognitive skill as compared to those adopted by families with lower socio-economic status.

There are numbers of reasons which explain how neighborhood plays a role in the intergenerational transmission mechanisms. The first reason formalized by Streufert (2000) is the role model. Decisions regarding educational attainments depend upon the perceptions of future economic benefits attached to different levels of education. Valuations of these benefits depend on the distributions of level of education and income observed in a community. Division of communities on the basis of income will mean that different locations produce different inferences about the value of education.

Second reason is the influence of self-identity on individual's choices (Akerlof & Kranton, 2000). The choices made regarding the level of education and nature of occupation depends on how an individual relates his/her own identity to that of others in

[22] Number of researchers, among them include Benabou (1996a, 1996b), Durlauf (1996a, 1996b), and Hoff and Sen (2005), developed models of neighborhoods and intergenerational mobility.
[23] Children between age 4 and 6 years with low scores of IQ before adaptation.

his community. For example, authors like Ogbu (2003) and Fryer and Torelli, (2010) argue that racial inequality in level of education between black and white is the perception of black that getting high level of education is a form of "acting and serving the white". Due to this perception of the black, they have less attraction and desire to get high level of education.

Third reason is the provision of access to information of employment opportunities. Interpersonal hiring networks play an important role for job market outcomes (Bayer et al., 2008). An individual may be termed as disadvantaged if information is not available to him/her (Calvo-Armengol & Jackson, 2004, 2007). In disadvantaged community access to information on job openings is low.

2.4.3 Genetic Transmission

The importance of gene and environment interactions is fully recognized by the behavioral genetics researchers. Based on vast literature, Jensen (1969) claims that 80% of the variance in IQ scores is genetic. Clark (2014) argues that intergenerational persistence is far higher than found through intergenerational elasticity or Markov Chains. Author suggests that gene also plays its role in intergenerational mobility. Genes affect intelligence of individuals which is then linked to income. There is a strong correlation between cognitive abilities of children and abilities of their parents. Daniels et al. (1997) find that 48 percent of the variation in IQ is genetic. According to Bowles and Gintis (2001), each of the genetics and environment contribute 0.2 to the intergenerational earnings correlation. Jencks and Tach (2006) in their study, using data of twins for Sweden and US, find that two-fifths of the intergenerational earnings

correlation is explained by genetic similarities. They explain the correlation between parents' and children's economic status via genetics as:

> *"If genetic variation affects any of the traits that labor markets reward, then genetic variation will affect economic success. If the labor market still rewards the same traits a generation later and genes still affect these traits, then biological children of a successful parent will still tend to have traits that the labor market rewards, even if the children have no social contact with this parent."(p. 33)*

As health plays an important role in the status attainment of an individual, therefore the transmission of health through genetics from parents to children affects the intergenerational mobility of socio-economic status. McCandless et al. (2004) finds that 71 percent of admitted pediatric patients in Ohio children's hospital have significant genotype origin.

Moreover, presence of genetic mutation is also one of the important factors which causes spread of the genetic diseases. Some diseases are almost 100 percent penetrant, that is, if the individuals have genetic mutations they will have the diseases. Diseases like Hemophilia and Huntington are highly penetrant. According to Petrucelli et al. (2007) mutations in genes, BRCA 1 and 2, are associated with breast cancer risks range from around 40 percent to more than 85 percent for women while the same risk is only 13 percent for general public (Ries et al., 2006). Though genetic mutations of the diseases like asthma, cardiovascular disease, and diabetes are yet to be discovered but relatives of the individuals suffering from these conditions are more likely to have those same conditions. Heritability estimates for bipolar disorder, autism and schizophrenia are, 80 percent, 90 percent and 75 percent respectively. For hyperactivity, heritability estimates range from 54 to 98 percent (Rutter et al., 1999).

2.4.4 Assortative Mating

Assortative mating concerns with the marriage patterns in a society. Assortative mating, with respect to income, education, or other factors which affect children, increases intergenerational persistence. A higher degree of assortative mating will decrease intergenerational mobility and will increase persistence in the socio-economic status (Holmlund, 2008). While maximizing their utilities, parents not only care about the income of their children but they also care about the income of the partners of their children (Holmlund, 2008).Therefore a strong impact of schooling of father in law is found on wages of individuals (Lame & Schoeni, 1993, 1994).A father in law at high socio-economic status helps to employ his son in law at high socio-economic position. Studies by Chadwick and Solon (2002) for Sweden, Blanden (2005) for Canada, Hirvonen (2008) for Sweden, Ermisch et al. (2006) for Germany and Britain found strong impact of Assortative mating on the intergenerational persistence in socio-economic status. Ermisch et al. (2006) shows that 40 to 50 percent of the intergenerational mobility estimates can be accounted for by assortative mating.

Educational institutions also play their role in shaping peer groups of individuals where people meet and form couples (Mare, 1991). Especially those institutions which sorts students on the basis of their ability or/and on the basis of family background give a rise to similar and homogenous types of students. Students of these institutions meet and mate with same type of individuals (Holmlund, 2008) and thus lead to persistence in intergenerational status. A study by Kalmijn and Flap (2001) shows that in Netherlands 15 percent of the couples were studying in the same school; 5 percent attended the same

elementary school and 7 percent the same secondary school. In US, a study by Lauman et al. (1994) explores that 23 percent of married couples met in their schools.

2.5 Chapter Summary

Socio-economic status connotes the social and economic well-being of an individual. Income, education and occupations are the most widely used measures of socio-economic status. Due to variety of measurement and estimation problems associated with the income variable, the level of education and nature of occupation are considered to be the best proxies for socio-economic status. Level of educational and occupational status of an individual can be easily reported and measured. While income is only a monetary measure, occupation represents monetary position, authority and supremacy, power and command over decision making, physical and mental efforts of an individual. However, high status occupation and high level of income, though not impossible, but are challenging without high level of education. In most of the cases, level of education determines the nature of occupation and thereby the level of income.

Intergenerational mobility in socio-economic status helps in increasing efforts, productivity, innovations and economic growth. It enhances equality of opportunities and reduces inequality. Immobility or less mobility in socio-economic status causes under development, deprivation, misallocation of the skills and talent, decrease in attraction and desire to get high education and hinders to move to the high status occupations. All these factors contribute to more poverty, inequality and slow economic growth.

Four different mechanisms play their role in the attainment and transmission of status. First is the family transmission mechanism in the form of parental investment in the human capital of children, which in turn determines their status in the society. Second

is the social level transmission mechanism in which work ethics, social network, perception about future benefits and self-identity, environment provided to an individual and political mechanism of the society play their roles in the status attainments. Third is the genetic transmission mechanism. Genes affect intelligence and level of ability of the children and transfer cognitive and non-cognitive skills from the parents to the children. Moreover, genes also play their part in the health of children which shapes human capital and in turn determines income level of the children. Fourth transmission mechanism is the assortative mating, in which the marriage pattern affects the intergenerational mobility in socio-economic status. Parents consider the status of the partners of their children. Therefore, the trend to marry in the similar class and family is one of the main causes of persistence in socio-economic status.

Chapter 3

REVIEW OF LITERATURE

3.1 Introduction

Intergenerational mobility is one of the most studied topics in all social sciences. An enormous literature on intergenerational mobility in income, educational and occupational status is available for both developed and under developed countries. The first study of intergenerational mobility can be dated back to Galton (1886), a biologist, who regressed height of children on height of parents. Sorokin (1927), a sociologist, formulated 23 mobility tables using data collected between 1900 and 1925. Occupational mobility has been studied in detail by Ginsberg (1929), Glass (1954) and Goldthrope (1980), amongst other, for Britain while Blau and Duncan (1967) and Featherman and Hauser (1978) are the pioneer studies for US. The leading economists started to evaluate the topic of income mobility in the latter half of the 20^{th} century and the pioneer studies are due to Soltow (1965) and Wolff and Slijpe (1973) for Scandinavia and Sewell and Hauser (1975) for US economy. However, interest of economists developed in this topic after Becker and Tomes (1979, 1986) who formally developed a model of the transmission of earnings, assets and consumptions from parents to children.

Most of the economists use income as indicator of socio-economic status to examine the intergenerational mobility. However, due to a number of issues with income, we focus on education and occupation as indicator of socio-economic status. Although

our main focus is on those studies which deal with educational and occupational mobility but importance of income mobility cannot be ignored anyhow. Rest of the chapter is divided into six sections. Section 3.2 discusses literature that is related to intergenerational income mobility. Section 3.3 focuses on literature that belongs to intergenerational educational mobility. Section 3.4 discusses literature concerned with intergenerational occupational mobility. In section 3.5 we deal with the studies that focus on intergenerational mobility of more than one aspect of socio-economic. Section 3.6 discusses the studies related to Pakistan and in section 3.7 we present the summary of existing literature.

3.2 Intergenerational Income Mobility

Atkinson (1981) is the first who worked on income mobility for UK. The study discusses and elaborates issues related to data and methodology in measuring intergenerational earning mobility. Author relates income inequality and equality of opportunity to the mobility of income across generation. To have a representative and accurate data, the author recollects data from second generation (the children) using data collected by Rowntree in 1950 from the first generation (the parents) in the city of York, UK (Rowntree & Lavers, 1951). Results of OLS regression, after adjusting for different aspects like age, provider of information of fathers' earnings and weekly versus hourly earnings, show that intergenerational earning elasticity is round about 0.45. On the basis of this value, the author calculates that the contribution to inequality in life time welfare would be 35 percent higher than if intergenerational earning elasticity would equal to 0 (a perfectly mobile society). Similarly, author computes that earning advantage of children born in the top decile, in terms of inequality of opportunity, would be 50 percent higher

than the children born in bottom decile. The author also calculates quartiles transition matrices and finds considerable earning mobility across the generations.

Solon (1992) challenges the representativeness of the data and measurement of variables of the past research studies and uses alternate data of Panel Study of Income Dynamics (PSID) to estimate elasticity of intergenerational income mobility for US. In the first step, the author uses single year measure of income variable of the father and finds the OLS estimates of intergenerational mobility which are, according to author, less biased as compared to the past research due to the use of a good representative data. Further, to handle the measurement errors in income variable and biasedness in the estimates of income mobility, the author takes the average income of father and uses instrumental variable estimation technique. Estimates of income elasticity increase as income of father is averaged over more years. Therefore, author concludes that intergenerational income mobility is less than the one found by previous studies and estimate of persistence in income across the generation increases with the increase in number of averaged years.

Dunn (2003) uses two sample 2SLS method to examine intergenerational income mobility in Brazilian society. Author uses data *Pesquisa Nacional por Amonstra de Domicilios* (PNAD) of 1976 to estimate the fathers' earnings based on levels of education of fathers in first stage and then uses PNAD 1996 in the second stage to regress earnings of sons on fathers' earnings predicted by fathers' levels of education. Results show that Brazilian society is more mobile relative to the other societies like US, UK etc.

Blanden (2005) compares the intergenerational income mobility of four countries; US, UK, Germany and Canada using the datasets; the Panel Study of Income Dynamics,

the British Cohort Study, the German Socio-economic Panel and the Canadian Intergenerational Income Data. To handle the problem of life time bias in income, the author obtains the income of parents and the children at the same age. Secondly author uses time averaged parental income. Results of the study indicate that mobility is higher in Canada followed by Germany, US and UK. When income of father is averaged over more years, intergenerational persistence increases. Results of the transition matrices show more persistence in US followed by UK, Canada and Germany. Author attributes less mobility in the US and UK to the differences in the returns to education and relationships between income and education.

Mazumder (2005b) uses Social Security Administration (SSA) data on earnings for US to find intergenerational earnings mobility. To addresses the issue of permanent versus current income in the intergenerational income mobility analysis author uses average of father's earnings. When earnings of fathers are averaged for two years, the study finds the earnings elasticity of about 0.25. However, when earnings of fathers are averaged over sixteen years, the intergenerational earnings elasticity rises to 0.6. Results also show that in case of 5-year averages, the observations get closer to one another which remove lifecycle bias in earnings. Assuming transitory variance as half of the variance of total income and no autocorrelation, the study finds an increase in attenuation factors from 0.51, with a single-year measure of income, to 0.91 with ten years' worth of data. Assuming autocorrelation of 0.7, the attenuation factors goes from 0.5, with a single-year measure of income, to 0.71 with ten years' worth of data. For 30 years' worth of data and autocorrelation coefficient of 0.7, the author finds a downward bias 0.8 in elasticity. Piraino (2006) examines the pattern of intergenerational income mobility in

Italy by using data from Survey on Household Income and Wealth (SHIW). The study uses two sample 2SLS method to handle the problem of life cycle biasedness in measurement of income variable. Data of fathers (born between 1927 and 1947) are taken from the survey of 1977. Data of sons, who are head of households and also report the socio-economic characteristics of their fathers, is taken from the survey of 2002. In the first stage, income of pseudo father is estimated from sample of 1977. The author finds strong persistence in income for Italian economy based on regression analysis. Results show that Italian fathers passed on about half of the economic advantages to their children. Author also uses transition matrices and divides sons and fathers into four income groups, "low income", "lower middle", "higher middle" and "high income". A strong "wealth trap" is found where poor of the Italian citizen have very small probability to move to rich class while the riches are very likely to pass on their economic status to their children.

Leigh (2007) examines intergenerational earning mobility in Australia by combining four surveys. Fathers' earnings are predicted by using the occupations of fathers reported by their sons and they are assigned the predicted earnings of male aged 40 years in that occupation. Results show that estimates of intergenerational mobility do not change over time for different cohorts. Less than a quarter of the economic status of Austrian fathers is transferred to their sons. Comparing with US, author findings show that Australian society exhibits more mobility than the US, especially a higher mobility is found for the poor households. Moreover, in both US and Australia, natives are found to be more mobile than the migrants and the difference in mobility between native and migrant is larger in the US than Australia. When compared with the mobility in the

sample of native fathers and sons, findings show no difference in the mobility in two countries. Results of the transition matrices show that it is more difficult and less likely to move to the rich from the poor class in US as compared to the Australia.

Dahl and DeLeire (2008) uses data of Survey of Income and Program Participation (SIPP) matched to the record of Social Security Administration (SSA) of US, detailed earnings records and summary earnings records. This survey contains history of career long earnings of fathers and earnings of their children. Fathers' earnings data is averaged over the ages of 22 to 55 to eliminate attenuation and life cycle bias. The children income is estimated over the age of around 36 years to eliminate attenuation or amplification bias in the estimates. Results of the regression analysis show that intergenerational mobility reduces when the biasedness in the earning variable is controlled. Similarly, when the data on fathers who have zero earnings in labor market are included in the sample, the intergenerational earning mobility increases. However, results based on Intergenerational Rank Association (IRA)[24] show a substantially high intergenerational mobility, and unlike regression analysis, the results are less sensitive to the specification choice or inclusion of the years of zero earnings of fathers. Moreover, results also show that mobility is larger at the middle of the income distribution (between 10^{th} and 80^{th} percentile) of the fathers' lifetime earnings and more persistence in income is observed at the both upper and lower tails of the income distribution.

Murtazashvili (2012) suggests random coefficient model and control function to capture family specific characteristics and to cope with the problem of biasedness and inconsistency in the OLS and instrumental variable estimates of intergenerational income

[24] In this method the position, expressed in percentile, of each member in the income distribution of each child is regressed on the position in the income distribution of their parents.

mobility. This method helps to capture variation in intergenerational mobility across the family. Using the Panel Study of Income Dynamics (PSID) data for US, the author finds stronger intergenerational income persistence than the earlier studies. Results also show that income persistence is heterogeneous in population and this persistence is decreasing with increase in fathers' income. Further, findings of the transition matrices show more persistence in the 1st and 5th quintiles. Sons in the middle three quintiles, more or less, have equal chances to fall in any of the income quintiles.

Chetty et al. (2014a) investigate intergenerational mobility in the US using data collected from federal income tax records spanning from 1996-2012. Data contains both income tax returns and third party information returns. To correct measurement error in income variable, the authors, take five year average of parental income. The authors use correlation between parent and child income percentile ranks rather than actual incomes. They conclude that results of rank-based measures of intergenerational mobility have not changed significantly over recent decades. Results are more robust to the alternative definition of income variable and its construction. Their results show larger mobility in income relative to the findings by Mazumder (2005b), who uses imputed income, using education and race, for 60% missing information on parental income for the same period.

Chetty et al. (2014b) find strong correlation of intergenerational mobility with residential segregation, family structure, income inequality and quality of school in the US. They find variations across the US in the rates of intergenerational income mobility. In the areas with larger share of African-American population, the mobility is significantly lower. Their findings show lower intergenerational mobility in the area where residential segregation is high, inequality in income is high, school quality is low,

lower rate of engagement in the community organizations, and higher share of children living in single-parent households.

Heidrich (2015) estimates intergenerational income mobility, at national and regional level, for individuals of Sweden who were born between 1876 and 1968.Author uses both traditional method of regression analysis and rank income regression. For Sweden as a whole, the study finds that association between income of parent and son has declined between 1968 and 1976 and that relative mobility is homogeneous across the country. At both tails of the income distribution, the difference of mean son income rank between families is same (22.2 percentile rank) in most of the local labour markets. A significant difference (lower or higher) in relative mobility is observed in only 9 out of 112 areas. The Umea region shows highest while Stockholm exhibits the lowest relative mobility. Across Swedish local labor market areas, the upward mobility is observed to vary considerably from 36.32 percentile ranks in Tors to 50.77 in Hylte. Moreover, results of the rural-urban analysis show that children who pass larger part of their childhood in rural areas of Sweden have worse outcomes as compared to children growing up in urban areas.

Above mentioned studies related to income show considerable variation in mobility. Theses variations are space, time and methodological specific. The studies mainly focused on the issues related to measurement error, life cycle bias in income variable and bias of estimates caused by endogeneity. Once these problems are rectified, the findings of these studies show that intergenerational income elasticity increases indicating more persistence in income across the generations.

3.3 Intergenerational Educational Mobility

There is a bulk of literature which provides evidence on the positive relationship between the level of education of parents and their children. This relationship provides basis for social stratification and intergenerational mobility in education and thereby mobility in income. We discuss some studies which relate parental level of education to the educational attainments of the children in this section.

Mare (1980) uses Occupational Change Generational (OCG) survey to examine the role of family background (parental education, family income) and occupational status on the decisions of education continuation in white Americans born in the first half of the 20th century. The author employs logistic response model and finds that the effects of income in the transmission of education decreases as the child progresses in his educational level. According to the author, the reason may be that sons of the most prosperous families are less likely to go to high level of education because they do not need lucrative employment. Influence of parental education is found to decline from the lowest to highest level of educational transition. Impact of father's occupation is significant only for high school and above level of education.

Lillard and Willis (1994) investigate the role of parental education in educational mobility for Malaysian economy using Second Malaysian Family Life Survey (MFLS-2). The study uses sequential choice model and finds that educational effects in Malaysia move across the gender line. Mother's education has strong effect on daughter's education while the impact of father's education is relatively higher on the education level of son. The study also finds significant positive impacts of family environments (house quality, availability of school and urban residence) on the level of education of the

child. Results also reveal that siblings of the same sex appear to be rivals in attracting the family resources invested in the education of children.

Behrman et al. (1998) use 28 household surveys of 16 Latin American countries for the period1980-1996.They define intergenerational mobility as the gap[25] of schooling of a child that cannot be explained by family background i.e. parental education and household income. The study finds that family background explains significant variations in schooling gaps which varies across different countries, time, parental schooling quintile and child age groups. Policies related to availability of resources for basic schooling and improving school quality, are found to have positive impact on intergenerational educational mobility.

Hausman and Szekely (1999) using OLS for the data of Latin America find that well educated mothers, who participate in job market, increase the level of education of their children. Results of the study show that probability that a child remains in school increases by 5 percent as a result of the mother's decision to join the labour market. It is further found that level of education of parents is more important determinant of the child's educational attainment than level of income of the household.

Lam (1999) investigates inequality in education and earning in South Africa and Brazil using South Africa October Household Survey and the Brazilian Pesquisa Nacional de Amostra deDomicilios. The study finds that inequality in earnings is same in both the countries but inequality in education is more in South Africa. Further, the education of children strongly depends on the level of education of their parents in both the countries. The effects of mother schooling is found to be almost equal to the effects of

[25] It is the expected educational attainment of a child on the basis of his age less the child's actual educational attainment.

father schooling in both the countries. However, the effect of mother education is larger in Brazil than the South Africa. Comparing South Africa with Brazil, the author also shows that dependency of educational level of children in South Africa is lesser than Brazil. Moreover, the impact of parental education is found to be nonlinear. The impact of educational level of mother with university degree is larger on the education of child as compared to mother without university degree. On the other hand, the education of mothers with incomplete primary education is found to have a very small impact on child's schooling.

Burns (2001) investigates the determinants of schooling gaps in Kwazulu-Natal, South Africa using panel data for the period 1993 and 1998. Results of the study show that schooling gap ratio reduces significantly with the higher levels of education of parents. Moreover, findings also reveal that a child having poorly educated mother and a highly educated father has same schooling outcomes as having two well-educated parents.

Spielaure (2004) uses event history data collected in the special program of the 1996 micro census, to assess intergenerational educational mobility for Australia. Author employs logistic regression model and finds a strong impact of parental education on education choice of a child. Further, results also reveal a high transmission at higher level of education. Moreover, significant variations in results are observed in the data of rural-urban population and male-female educational level until 1970. However, after 1970, the intergenerational educational mobility rates by gender, region and parents level of education remain stable. Based on current patterns of marriages and fertility results of the

micro-simulation predict that half of the population will get college level education in the future and 30% of them will get university level education.

Hertz et al. (2007) examine the trends in intergenerational mobility of education for a sample of 42 countries. They report significant regional differences in educational mobility. Results show that mobility is lowest in Latin America and highest in the Nordic countries. Peru followed by Ecuador and Panama are the most immobile countries based on the correlation analysis while Ethiopia (rural) followed by China (rural) and Kyrgyzstan are the most mobile countries. On the basis of intergenerational elasticities, East Timor followed by Egypt and Pakistan are the most immobile countries while Kyrgyzstan followed by China (rural) and Ukraine are on the top of the list of most mobile countries. Italy and the US are found to be the least mobile of the western nations as measured by the intergenerational correlation in years of education. Britain is found to be immobile when measured by the intergenerational elasticity but mobile when measured by the correlation[26]. They also estimate the global average correlation between parent and child's schooling and it is found to be around 0.42 for the past fifty years.

Chevalier et al. (2009) use data on a sample of European countries and the US to find intergenerational mobility by using the method of Bartholomew index and Eigen values. Based on Eigen values, Germany is found to be more mobile followed by Chile and Poland. Nordic countries are found to be least mobile. Finland is at the top of the list of immobile countries followed by Belgium and Norway. However, results based on Bartholomew index, Switzerland is found to be the most mobile country followed by Germany and Slovenia while Belgium followed by Canada and Northern Ireland are the most immobile countries. Authors also show that educational mobility is higher in

[26]Authors attribute this difference due to the low variability in years of schooling for parents in the sample.

countries where public expenditure on education is high and there is more persistence where return to education is higher.

Bauer and Riphahn (2009) examine the role of school starting age on the intergenerational mobility of education using data of Swiss 2000 census. Using multinomial logit, results show that early enrolment increases educational mobility. Authors argue that it is due to the fact that once children are in school, inequalities in family background have less impact on children education.

Van Doorn et al. (2011) estimates intergenerational educational mobility in 250 cohorts of 28 countries with special reference to degree of industrialization, female labor force participation, the structure of educational system and the political ideology of a country. Authors utilize data of European Social Survey (ESS) of 2002, 2004 and 2006 and find a weaker relationship between education of parents and their children in highly industrialized country-cohorts as compared to developing country-cohorts. The study also reveals that this relationship is stronger in country-cohorts where the process of industrialization is rapid as compared to those where industrial growth is slow. It is also found that the relationship between parent's education and education of children decreases with the increase in female participation in labor force. Increase in educational expenditure is found to increase the educational mobility however, no significant effect is found for pupil-teacher ratio. Moreover, the study also reveals that although there is a higher level of education in social-democratic and communist country-cohorts but no significant increase in educational mobility is found.

Daude (2011) investigates educational mobility in 18 Latin American countries. Results show high persistence and low degree of intergenerational mobility in Latin

America for both male and female. It is also shown that children of high educated parents attain high level of education and children of less educated parents move towards high level. Moreover, results of regression analysis show significant differences in mobility among different cohorts; the most recent cohort exhibits more mobility than the earlier cohorts for both male and female. Further, the parental background is more important for the lowest quintile of education as compared to the higher quintile. The author also uses ordered logit model and finds more persistence at higher level of education while children at the middle have smaller chance to move towards the highest level of education along with their chance to move towards low level of education. On the other hand, children whose parents were at the lower end of education have very little chance to move beyond the primary education.

Labar (2011) uses five rounds of China Health and Nutrition Survey (CHNS) to investigate intergenerational mobility in nine provinces of China. Results of the transition matrices reveal that there is upward mobility at lower education levels and at the upper ends there is some mobility in both directions. Author finds significant role of the parents' educational attainment and income on the child's level of education. However, the impact of parental education is falling over time (1991-2004) indicating an increase in educational mobility. Income not only plays a high role on the educational attainments of a child but its role is increasing over time. Moreover, mobility is found to be larger in urban regions as compared to the rural regions and the upward mobility of education is increasing overtime in urban region. Results based on quintile regression show that the role of parental characteristics increases with the increase in attainment of level of education by a child.

Azam and Bhatt (2015) use the data of Indian Human Development Survey (IHDS) and show that the average intergenerational correlation in education for India is higher than the average of global correlation. The authors also find that sons of less educated fathers are more likely to achieve higher level of education than their fathers, implying an upward mobility. However, results also show that sons of highly educated fathers are more likely to achieve less education than their fathers'. These patterns in education mobility hold across social groups, which imply a decrease in the inertia of the prevalent discrimination based on caste system. At state level, though all states witnessed an increase in educational mobility across cohorts; but there is significant variation across the states. For example, improvement in mobility found in Maharashtra, Orissa and Rajasthan is more as compared to improvement in West Bengal and Tamil Nadu. The results also show that estimates of mobility have strong association between state ranking in terms of per capita education spending and estimated mobility measure at the state level.

Borkotoky et al. (2015) investigate the impacts of partner selection, timing of marriage and child bearing on educational attainments of children. The study uses data from the third round of District Level Household Survey (DLHS-3), conducted during 2007-08 in India. Results of the study show that higher educated women marry late, have fewer children, and marry men with higher or equal education. Moreover, results also show that education of women plays more significant role than education of husband in reducing fertility. The study also finds that level of educational attainment of children is higher than their parents and better educated mothers provide equal education to both male and female children and do not discriminate between them.

Assad and Saleh (2016) investigate the impact of public school supply on the intergenerational mobility in education using Jordanian Labor Market Panel Survey (JLMPS). The authors find positive impact of local supply of school on the mobility in education both for sons and daughters. Mobility in daughters is found to be larger than mobility in sons. The study also finds that mobility increases over time; the most current cohort exhibits more mobility.

From the above studies on educational mobility we infer that despite differences across the countries and time there is an upward mobility in educational attainments around the world. This indicates an improvement in the educational level of the sons' generation relative to their fathers' generation. Numbers of factors like parental education, parental income, household size etc. contribute significantly towards the educational mobility. Apart from these micro variables, government policies like early admission in school, prescribing compulsory age of education, government spending on education, supplying schools and the environment where the individuals live, are found to have played their significant role in educational mobility. However, despite upward mobility, the studies also show that chances to attain high levels of education are not equal for everyone. Children of less educated parents have smaller chances to attain high levels of education as compared to the children of high educated parents.

3.4 Intergenerational Occupational Mobility

Intergenerational occupational mobility has been the subject of interest for the social scientists. Though occupational mobility has been investigated by the researchers since long time ago but the process of stratification has attracted the attention of many researchers in the areas of inequality, stratification and mobility only after the notable

study of Blau and Duncan (1967) on American occupational structure. Some of the empirical studies on the subject are presented below:

Duncan and Hodge (1963) investigate intergenerational occupational mobility using data derived from Chicago portion of the Six City Survey of Labour Mobility. They use data of males with age between 25 to 64 years old. Their study assigns two digit codes to occupation and forms an index of socio-economic status ranging from 0 to 96. The results indicate that occupations of male working force are weakly linked to the occupations of their parents. In case of whites, level of education is found as more important determinant of occupation of a son than the occupation of non-farmers fathers. However, results also show that for the same level of education, males whose fathers were non-farmers are more mobile than those whose fathers were farmers. Similarly, after controlling education and origins, white males are found to be less persistent and more mobile as compared to the non-white males.

Blau and Duncan (1967) use the Duncan ratio scale for occupations prestige. They develop and fit the path model for US society. Their results reveal that occupational achievements in US mainly depend on family background and on his/her educational level. The results of the study show that occupational status of a son is influenced by the occupation and educational level of his father. The most important in the status attainment of a son is his own level of education which further depends on his family background. An individual born in a privileged family gets better education and high occupational status than the individual born in poor family. Their results show that direct effect of family income on earnings of an individual is very weak but it has substantial impact indirectly through educational and occupational attainments.

Ganzeboom et al. (1989) investigate intergenerational occupational mobility in 35 countries covering the period from 1958 to 1985. They divide occupations into four categories. The study uses two-step procedure. In the first step, parameters of the mobility (measuring the extent of off diagonal association) and parameters of the inheritance (summarizing diagonal values) are obtained from transition matrices. In the second step, these parameters are analyzed by analysis of co-variance models. Their results show substantial differences in occupational mobility across different countries and time. Results also show that increase in openness enhances, though smaller in magnitude, occupational mobility. However, the authors argue that the hypothesis of common social fluidity is incorrect as substantial differences in mobility are found for different countries and over different times.

Erikson and Goldthorpe (1992) examine occupational mobility across twelve countries covering cohorts born between 1905 and 1945. Their results show that mobility in occupations is higher in Czech, Australia, Japan, US, Poland and Sweden. In contrast, Scotland, Netherland, France, Ireland and Germany are the less mobile nations in terms of occupations. However, their results do not support the hypothesis that industrialized courtiers exhibit more mobility.

Sjogren (2000) investigates mobility in Sweden, using Swedish Level of Living Survey (LNU) conducted in 1991. Author uses seven categories of occupations in his analysis and links the occupational mobility to transmission of earnings and income. It is argued that due to information externality from parental occupation, the children make better assessment regarding their earnings from the occupations of their parents. Results of the transition matrix support the hypothesis that children's occupations depend on the

occupations of their parents. Using Mixed Multinomial Logit technique, author finds that individuals are more concerned to economic benefits from the occupation, that is, they value wage rate positively and feel hesitant while choosing unfamiliar occupations. Results also show that poor put more importance on return to education. Children of less educated parents are more sensitive to economic incentives as they normally choose occupations where wage rates or returns to education are high. On the hand, those individuals whose parents are well educated choose those occupations which require high level of education, and they are less concerned to the actual level of return to education.

Ermisch and Francesconi (2002) estimate intergenerational occupational mobility for UK using longitudinal data of British Household Panel Survey (BHPS) for the period of 1991-1999. The authors use two different measures of socio-economic status; first one is the Hope-Goldthorpe index[27] of occupational prestige and second is the earnings and annual income of parents and children. Results show a strong persistence in the occupational status with intergenerational elasticity ranging from 0.45 to 0.75 for father-child pairs and from 0.30 to 0.50 for mother-child pairs. Their findings also show a nonlinear effect that families of higher socio-economic status have higher intergenerational elasticity indicating that upward mobility from the lower status is more likely than the downward mobility from the higher status. Their results also depict that occupational mobility is higher in the recent cohorts (the younger children) as compared to the earlier cohorts (the older children).

Beller and Hout (2006) examine the income and occupational mobility in US. They use data set of "General Social Surveys, 1972–2004". The authors divide occupations into six categories. Though results of transition matrices show high

[27] This index was developed by Goldthorpe and Hope (1974).

persistence in lowest and highest occupations but as a whole, study finds occupational mobility in US. Results indicate that15% of the mobility is due to structural changes in the economy and economic growth, that is, more professional jobs and less farms jobs are available to sons than to their fathers. The results also suggest that mobility in 1940s-1960s is smaller as compared to 1970s. However, the occupational mobility again decreased during 1980s and 1990s.

Zijdeman (2008) examines the impact of industrialization, urbanization and means of communication on intergenerational occupational mobility in 117 municipalities in the Dutch province of Zeeland. Author derives individual level data from marriage acts and then observations are grouped into municipalities for the period 1811 to 1890. Using fixed effect model, author finds that association between occupations of fathers and their sons not only changes over time but also changes across the municipalities. Study also finds that differences in association over the time and across the municipalities are partly due to industrialization, urbanization and means of communications. Results refute the logic of industrialization thesis and find that association between occupations of fathers and sons increased in the nineteenth century and thus support the reproduction theory. The results also show that association between occupations of fathers and sons increases with mass communications and urbanization during the study period in the province of Zeeland.

Emran and Shilpi (2011) present evidence on intergenerational occupational mobility from agriculture to non-agricultural sector for Nepal and Vietnam. The authors use Nepal Living Standard Survey (NLSS) and Vietnam Living Standard Survey (VLSS) taken from World Bank Living Standard Measurements Study (LSMS). Results of the

study reveal that intergenerational occupational correlations between parents and children run along gender lines, father-son and mother-daughter, in Nepal. As a whole, their results reveal that intergenerational occupational persistence, especially for daughter, is much stronger in Nepal. In case of Vietnam, the intergeneration occupational correlation between mother and daughter is found stronger as compared to the correlation between father and son. Inclusion of other control variables (education, village level fixed effects, age) did not change the magnitude of parents-children correlation of occupation in both the countries. Results also show that even a moderate genetic correlation, easily explain away the observed correlation in nonfarm participation between the father and a son in both Nepal and Vietnam. In contrast, the correlation in occupation choice between mother and daughter is much stronger and is unlikely to be driven by moderate genetic correlations in Nepal, though the same correlation is entirely driven by genetic correlation in Vietnam.

Van Bavel et al. (2011) tests the impact of family size on occupational status using data of a Belgian city - The Antwerp. Results show that chances of downward occupational mobility of sons and daughters increases as the number of brothers and sisters increases; especially in the middle class families. The downward mobility is found to be larger when the number of brothers and sisters exceeds five. However the effect of number of brothers and sisters of the working class background is found to be insignificant in the occupational status of the children.

Hellerstein and Morrill (2011) utilize data of three surveys the General Social Survey (GSS), the Survey of Income and Program Participation (SIPP), and the Occupational Changes in a Generation (OCG) and examine the changes in occupation-

specific human capital transmission between fathers and daughters spanning birth cohorts from 1909 to 1977 in US. The results show that there is significant increase in probability that daughters work in their fathers' occupations over time. Their findings reveal that in recent birth cohort 20% of daughters worked in the same occupation as their fathers as compared to only 6% in the earliest birth cohort. Moreover, probability of woman to enter in the occupation of father in law is also increasing. However increase in probability to enter father's occupation is larger than the increase in probability to enter in the occupation of father in law. Authors show that increase in probability to enter in the occupation of father is not due simply to changes in the marginal distribution of women's occupations, but is also partially due to increased transmission of occupation-specific human capital from fathers to daughters.

Motiram and Singh (2012) use the Indian Human Development Survey (IHDS) data set to measure intergenerational occupational mobility in India. Their findings reveal strong intergenerational occupational persistence across all occupational categories. However, the probability that a son would fall in the father's category is higher for the low-skilled/low-paying occupations[28]. They also show that mobility in urban regions is higher than rural regions. For rural data, their results reveal that the sons of fathers who are in high status occupations (Professionals, officials and related) are more likely to fall in lower status occupations, especially in farmers. The sons of farmers are more mobile towards the higher status in the urban region as compared to the rural region. Study also reports a considerable downward mobility for the Scheduled Casts and Scheduled Tribes (SC/STs) and show that this is higher than the same for non-SC/STs. Further, they also find that in low-skilled/low-paying occupations there is smaller persistence in non

[28] Their results show that almost 50% children of the agriculture labors engage in the same agriculture job.

SC/STs, as compared to the same for SC/STs which observe higher persistence in low-skilled/low-paying occupations.

Long and Ferrie (2013) use historical census and survey data to compare intergenerational occupational mobility in US and Britain at around 1880 and 1973. This study finds that US was much more socially mobile than Britain in the period around 1880, but the level of social (occupational) mobility around 1973 was similar in the two countries. Results of the study also demonstrate that there was a sharp decline in social mobility in the US over its history of rapid industrialization and economic expansion from the post-Civil War era to the post-World War II era. Thus, the study supports the popular conception of America as an exceptional land of opportunity for all, but only prior to 1900.

Xie and Killewald (2013) criticize the quality of data and method of estimation of Long and Ferrie (2013). According to the authors, the method (odd ratios) used by Long and Ferrie (2013) is not suitable for measuring social mobility of farmers. Therefore the decline shown in social mobility in US is due to misleading results for the farmers, who experienced a huge decline in the US labor market since 1880. Once methodological errors are removed and data of farmers is suitably adjusted, the US economy is found to experience an increase in social mobility over its history of industrialization and economic expansion

Schwenkenberg (2013) analyses the differences in occupational status across generations in the US men and women using the Panel Study of Income Dynamics (PSID). Author includes individuals born between 1945 and 1985 and finds that men are not only more likely to be in occupations with high earning potential but they are also

more likely to select low-skill occupations which they are more likely to inherit from their fathers. Results also reveal that while men work in occupations that require full time, women choose those occupations which require low hours to work and high returns to experience. Men are more likely to work in high-powered occupations which require high levels of education and large on the job human capital investment and offer relatively high returns. At the same time men are also more likely to work in low skilled occupations and then pass on this status to their sons. Study finds that men are more upward mobile than women when occupational status is measured by occupational earnings. However, when status is measured by using occupational education, then women are found to be more upward mobile than men.

Raitano and Vona (2015) use the first cross sectional wave of the European Union Survey on Income and Living Conditions (EU-SILC 2005) for the analysis of 8 European countries (Germany, France, UK, Spain, Italy, Ireland, Finland and Denmark). Individuals between age 35 and 49 years are included for assessing intergenerational mobility in occupation. The authors use continuous index for social position rather than discrete categories. Based on bivariate correlation analysis, Germany appears as the most mobile country while Italy, France and Spain appear the least mobile. Analysis of transition matrices also confirms that Germany is the most mobile country among the others. The same ranking of intergenerational mobility is preserved, except UK, in multivariate regression analysis. Results show a strong influence of family background on children occupational attainments in all the eight countries. The authors also use the residual background correlation, which is decomposed between parental background and child earnings. A high and significant residual background correlation in the UK and

Southern countries masks penalties to the upward mobility and insurance against downward mobility. Insignificant residual background correlation encompasses penalties to both upward and downward mobility as observed in Germany and France.

Tiwari (2016) uses household survey data collected in a project Social and Educational Status of OBC (Other backward casts) and Dalit Muslim in Uttar Pradesh of India. Results of the study show that individuals who belong to households with large landholdings are more likely to choose the occupations of parents. Moreover, results also show that individuals belonging to OBC and SCs (Scheduled Casts) are more likely to choose the occupations of their parents. Further, as level of education of the children increases they are moving away from their parents' occupation. This suggests that with higher level of education more opportunities of employment are available to the children in different occupations. The study also finds that poor face lack of opportunities to move to the higher status and better occupations while the rich are less likely to choose occupations of their fathers and grandfathers.

Above literature on intergenerational occupational mobility indicate a strong persistence in occupational status. Majority of the children choose occupations of their parents. Especially the studies show strong persistence at lowest and highest status occupations. Factors like occupations of the parents, the level of education of a child, occupation income, family size and parental level of education are found to have important role in the occupational attainment of a child.

3.5 Intergenerational Mobility (Educational, Occupational and Income)

Behrman et al. (2001) compare the intergenerational educational and occupational mobility in four Latin American countries (Mexico, Peru, Brazil, Colombia) and the US.

They find higher educational mobility in US than Latin American. Within Latin American countries, mobility in Mexico and Peru is higher than Brazil and Colombia. Their findings also show that women are more mobile than men in Brazil and Colombia. However, in the US, Mexico and Peru, educational mobility is more in men as compared to women. Results also indicate that differences in educational mobility of men and women in US and Brazil are smaller as compared to the other three countries. Study also finds a positive relationship between return to education of a child and schooling of parents. Based on distribution of occupations into white collar and blue collar, study finds evidence that US has the highest intergenerational occupational mobility, followed by Colombia, Brazil, Peru, and Mexico. In Brazil and Colombia, occupational mobility is higher than the mobility in education while the converse is true for Peru and Mexico. Finally the authors also show that economic growth does not cause equalization of the opportunities rather it is the improvement in education which expedites this.

Nguyen and Getinet (2003) examine intergenerational educational and occupational mobility in US using National Educational Longitudinal Studies (NELS). In this survey, individuals are followed when they were students of grade 8 in 1988 till they entered in the labor market in 2000. Using "ordered logit", the study finds that impact of father education is stronger than the mother education for both daughters and sons. Results also indicate that the impact of mother's education is stronger on the daughter's education than the corresponding impact on son's education. Similarly, they find that occupational persistence is stronger when moving from low skill occupation to high skill occupation. Fathers' occupations are found to have stronger effect on their sons' and daughters' occupations as compared to the corresponding impact of mothers' occupations

at all levels of skills. Moreover, the impact of mother occupation is statistically significant only at higher skill occupations. The link between sons' and fathers' occupational status is found to be stronger than the link between fathers' and daughters' occupational status while the link between son and mother is weaker than the link between daughter and mother. Results also indicate that though one or two siblings do nothing harm to the educational attainment and occupational status of a son but three or four siblings lowers his educational attainment and occupational status. In case of daughter, siblings do nothing harm to the educational attainment, however, they do reduce the occupational status of a daughter if there are more than one sibling.

Holmlund (2008) evaluates data of Swedish educational reforms of 1950s, by extending compulsory education and ability tracking, to assess intergenerational mobility and the extent to which assortative mating contributes to this mobility. Author uses data compiled from Swedish administrative records and finds a significant increase in income mobility. However, the reforms have zero average effect on earnings because the positive gains for the individuals from the poor background are countered by the negative gains by the individuals belong to the rich families. Moreover, results also show that a one year increase in parents' education leads to increase education of a child by 0.4 years of schooling. Reform is found to reduce the association in education between an individual's partner and parents, which the author interprets as an effect operating through reforms on mating patterns.

Girdwood and Leibbrandt (2009), show that average education of children is more than parents and even more than grandparents in South Africa. Moreover, results also indicate upward mobility in education across race, age, genotype and gender. Based on

transition matrix, Africans and Coloured South Africans appear to be more mobile than White South Africans. However, this situation is reversed when results are obtained through correlations. A strong persistence is found in occupational status. Children pursuing the occupations of their parents most likely, across race, gender and genotype. In addition, Africans and Coloured South Africans are less mobile than white South Africans. Despite this, there is considerable upward mobility of children in relative to their mother's occupation. Results also show that as age of the children increases, the more their skill level comes to reflect that of their parents.

Majumder (2010) in a study for India examines the intergenerational mobility of educational and occupational attainment levels in advanced and backward casts. Based on transition matrix, upward mobility in terms of educational attainment levels is found. However, this mobility is lower in backward casts as compared to advanced casts and this gap has decreased, though still significant, in 2004 as compared to 1993. Occupational mobility is observed somewhat sticky though it improves during the period 1993-2004. For advanced casts mobility in girls is higher as compared to boys. Moreover, in advanced casts mobility from low to high grade job is observed while in backward casts mobility is observed from one occupation to another within the broad grades. Results of regression analysis show that in rural region parental education has significant impact on children's educational level. For daughters the impact of maternal education is stronger than paternal indicating the importance of maternal education for sending girls children to school. Moreover, a strong parental educational effect is found for backward casts showing a lower intergenerational mobility in theses casts, specifically, lower mobility is found for daughters as compared to sons. Similarly, occupation of parent significantly

influences the occupation of child. This influence is strong for backward casts as compared to advanced casts. The results also indicate that much of the intergenerational occupational mobility is lateral and not vertical.

Ray and Majumder (2010) examine the extent of intergenerational mobility in both educational and occupational attainments for different ethnic groups in India to understand the inertia of the prevalent discrimination. Study utilizes the National Sample Survey Organization (NSSO) database on employment issues. Their results indicate strong intergenerational stickiness in both educational achievement and occupational distribution among the Scheduled Castes and Scheduled Tribes. Occupational mobility is lower than educational mobility, indicating that educational progress is not being transformed into occupational improvement and brings up the possibility of discrimination in the labour market. The regional pattern suggests that mobility levels, in general, are lower in many of the lagging states and that the mobility of the excluded groups is lower than that of the advanced classes in most of the regions.

Hnatkovskay et al. (2013) use five rounds of National Sample Survey (NSS) surveys[29] to examine intergenerational mobility in historically disadvantaged Schedule Casts and Schedule Tribes (SC/STs) of India relative to the rest of the workforce in terms of education, occupation and wages. Their results show that cast-based historical barriers to socio-economic mobility in India are breaking down. The rates of intergeneration income and education mobility of SC/STs converge to the level of non SC/STs. Moreover, SC/STs are switching to the occupations of their parents at increasing rates, matching the corresponding rates of non SC/STs. In both SC/STs and non SC/STs a higher intergenerational mobility is observed in the middle income group. Both SC/STs

[29] 1983, 1987-88, 1993-94, 1999-00, and 2004-05.

and non SC/STs show improvement in the level of education of sons, share of illiterates declined significantly in both the groups and convergence towards equal education is found in both SC/STs and non SC/STs over the study period. Authors classify occupations into three categories; white collar occupations, blue collar occupations and agriculture. Their results show that in 1983, 32% of the sons' occupation was different from their fathers, while the same increased to 41% in 2004-05. It increased from 33% in 1983 to 42% in 2004-05 for non SC/STs while for SC/STs it has gone from 30 percent to 39 percent.

Blanden and Macmillan (2014) link intergenerational mobility in income to inequality in education in UK in the 1958 and 1970 birth cohorts. This study shows that gap in the educational attainment, though not at the high level, is reducing. Further decrease in educational inequality coincides with the increase in government spending on education. Findings of the study show that stable return to education causes improvement in the mobility in income. However, the study also reveals that there is little improvement in the reduction of inequality at higher level. In other words if higher education matters in obtaining the most rewarding opportunities in the labor market, then these findings cast doubt on the role of education in the improvement of income mobility.

Fachelli and Planas (2014) investigate intergenerational educational and occupational mobility in the university graduate students of Catalan, Spain. Data on education and occupation of their parents was obtained through primary survey from the university graduates. Results show that majority of the graduates (70.7%) have the parents without university studies. Out of these (40.1%) come from the households where the parents have at most primary education and (30.6%) have parents with secondary

education. 29.1% of the graduates belong to households whose parents have high education. Results also show that generation born in 1980 has on average 28% opportunities of obtaining university qualifications, the opportunities of those who were born into families with primary education or less are 22.4% and those from families with secondary education are 25.2%, while those children whose parents have university qualifications represent 70%. Authors also find a considerable upward mobility in occupation status. According to the results, 51.1% of the sons have high status occupations than their parents'. A strong persistence is observed at highest status occupations showing a sort of discrimination. At the lowest status, a considerable upward mobility is observed.

3.6 Intergenerational Mobility: Literature related to Pakistan

It can be seen that there are bulk of studies on intergenerational mobility at international level. Researchers not only covered the developed world but also substantial research is available for developing world. However, this area of intergenerational mobility is neglected in the economic literature concerned with Pakistan. There are only few studies on the topic and they are also suffering from serious issues; especially their data are not representative for the whole country.

To the best of our knowledge, Havinga et al. (1986) is the first research paper in the literature of intergenerational mobility in Pakistan. They use data of 1200 respondents collected from 10 major industrialized cities to investigate mobility at individual as well as at family level. At individual level, using income criterion, the study finds that 31% of the sons perform better than their fathers, while on the basis of wealth criterion; the wealth of 60% of the sons is found to be more than their fathers. Results at family level

show that families as a whole perform better, as compared to individual level, than past generation. At family level, intergenerational mobility increases to 38% in the case of income and 65% in the case of wealth. The study also finds that age, occupation, working status and education of fathers and sons significantly increase intergenerational mobility.

Cheema and Naseer (2013) examine the intergenerational mobility between propertied and non-propertied social groups[30] in rural Sargodha, Pakistan. They use data from Sargodha Village and Household Survey (SVHS) conducted between November 2007 and March 2008. This survey covers 35 villages of district Sargodha. The estimates of mobility by the authors are for three generations i.e. grandfather, father and son. Results show that there is increase in intergenerational mobility in education as grandfather-father pairs show more rigidity than father-son pairs. However, results also indicate that mobility in non-propertied group is less than propertied group. The results also show that educational mobility is much higher among zamindar (landlords) than artisan and historically depressed quoms (sects). 50% of unschooled grandfathers of zamindar (landlords) sent their sons to school while about 80.8% of unschooled fathers sent their sons to school. While the same rate was 44.3% and 70% respectively for artisan households and 18.5% and 60.5% respectively for historically depressed quoms.

Javed and Irfan (2014) examine intergenerational occupational, educational and income mobility using Pakistan Panel Household Survey (PPHS) of 2010. Results based on transition matrix show a strong persistence in educational status. They find that sons are more likely to attain the same level of education as their fathers did in overall data for Pakistan and as well as in rural and urban population. Their results show that probability

[30] Propertied is a group of families who were assigned the ownership and control of agricultural and residential land and village common property. Non-propertied group of families have normally poor economic and social outcomes.

of acquiring the highest level of education by son increases with the increase in educational status of the father. Moreover, they also find that older sons are more likely to attain the same level of education of fathers as compared to the younger sons. Similarly, study finds that chance of a son to be in low status occupation is high if his father is also in a low status occupation. However, in the high status occupations, there is downward mobility. The chance of a son to reach the high status occupation given that his father is also in high status is smaller than his chance to fall in low status occupations. Same pattern of occupational mobility is observed in rural and urban regions as well as in recent and older cohort. Results of income mobility indicate a high persistence at the lowest quintile (poorest individuals). The chance of the poorest segment of the population is found to be very small to reach the highest income group. Regression results of their study suggest that socioeconomic status of father is crucial determinant of the economic position (income) of their son. Income mobility in urban region is found to be larger than the rural region and the older cohorts are more mobile than the younger cohort.

3.7 Summary

In literature, three different proxies, income, education and occupation, are used to find intergenerational mobility in socio-economic status. Considerable variations in results of different studies are found. The variations are time, region, measurement and methodological specific. Studies related to income mobility focus mostly on the issues related to measurement error, life cycle bias in income variable and bias of estimates caused by endogeneity. To handle and rectify these issues, researchers use averaged income, same ages of son and fathers or the ages (usually between 30 to 45 years) at which earnings of sons are comparable to the earnings of the parents and instrumental

variable methods of estimation. It is found that once these problems are corrected and resolved, intergenerational income elasticity increases indicating more persistence in income status across the generations.

Different methodologies, like educational index, educational gap, education as continuous variable, educational continuation choice and educational level divided into different categories, are used for educational attainments and its mobility. Despite differences across the countries and time, studies of educational mobility, on the average, find upward mobility indicating improvement in the educational level of the sons' generation. Apart from the father's education and family background, significant roles of different factors like mother education, government policies like early admission in school, prescribing compulsory age of education, government spending on education, supplying schools and the environment where the individuals live, are found on educational mobility. However, despite the upward mobility, empirical literature reveals that chances of poor to attain high level of education are smaller than the chances of rich.

Occupation is the next proxy used for socio-economic status. A stronger persistence is observed in the lowest and highest status occupations. Specifically more persistence is found for the farmers. Most of the children are risk averse and therefore they choose familiar occupations like occupations of their parents, which is one of the important reasons of the occupational persistence. Also skills are mostly transferred in families or in their family environment which causes persistence in occupational status. Apart from the occupation of parents, the educational level of a child is found to be the most important determinant of his occupational status. Besides its direct impact, the family income is found to play its indirect role in improving the occupational status of a

child through investment in the human capital or education of the child. Moreover, studies also show the importance of parental education in the occupational attainment of a child.

We find numerous studies for both developed and underdeveloped countries but there is no single comprehensive study available for Pakistan on intergenerational mobility. Although Javed and Irfan (2015) is a good effort in this direction but their study suffers from a number of shortcomings. First the data, Pakistan Panel Household Survey (PPHS)-2010, used in their study is not a good representative sample for the whole country. It covers only sixteen districts and also ignores the big cities. Secondly the sample size of co-resident son-father in their study is small, particularly, in high level of education and occupation[31]. Third, they use only transition matrices and ignore the importance of other relevant variables in the attainment of educational and occupational status. Likewise, study by Havinga et al. (1986) is confined to 10 major industrialized cities only. Their findings are based on the respondents of 1200 individuals in these cities. Therefore their data also lack representativeness for the whole country. Moreover, they focus only on the mobility in income and wealth across the generation but ignore educational and occupational mobility. Study by Cheema and Naseer (2013) focuses on only one district (Sargodha) and therefore its scope is very limited.

The current study intends to fill this gap in the literature and tries to focus on intergenerational mobility in educational and occupational status in Pakistan. In this study we use the most recent, representative and comprehensive data set of Pakistan Social and Living Standards Measurement (PSLM) survey of 2012-13, which covers almost all

[31] For example in their sample for the post graduate fathers there are only 3 sons in the urban and 11 sons in the rural sample.

districts of Pakistan. We will extend our analysis to urban-rural regions as well as to all four provinces. Besides the large sample size, we also consider the importance of other relevant variables in our research. To obtain meaningful numerical estimates, we will use the most appropriate econometric technique (categorical regression analysis) along with the transition matrices.

At international level, the study by Nguyen and Getinet (2003) seems to be the most relevant to our study. The authors examine both educational and occupational mobility and employ the categorical estimation methodology like ours. However, they use ordered logit model without confirming the assumption of proportional odd ratio. Moreover, their model lacks the important variables like income and wealth of the family. In contrast, we intend to test the appropriateness of the estimation methodology first and then obtain meaningful results. Girdwood and Leibbrandt (2009) also use the ordered logit model to assess educational and occupational mobility, however, without testing the appropriateness of the methods. Study by Emran and Shilpi (2011) although uses the same methodology but suffers from limitation in scope. The authors, divide the occupation into only two categories, agriculture and non-agriculture, which may not be suitable for assessing the true socio-economic status of an individual. Besides other variables, all these three studies ignore the role of education of children in their occupational choice, which is an important determinant of occupational choice. The present study is designed such that to overcome these shortcomings and use most comprehensive data set to get the meaningful results.

Chapter 4

MODELS OF EDUCATIONAL AND OCCUPATIONAL MOBILITY A THEORETICAL FRAMEWORK

4.1 Introduction

Reliability of any study is determined by the conceptual framework and its theoretical backgrounds. Conceptual framework explains as to how the variables concerned are interlinked, how they affect each other and in what direction. It provides logical explanations to the relationships among the variables, which not only help in the specification of empirical model but also guide to the appropriate methodology for obtaining meaningful empirical results. We follow the models developed by Becker and Tomes (1979), Loury (1981) and Becker et al. (2015) for educational mobility although the said models were used for income mobility. The rational is that since the transmission of income from the parents to the children takes place through the investment in human capital (education) of children therefore our focus is on the educational mobility. For occupational mobility we use the occupational choice model proposed by Emran and Shilpi (2011). The authors use their model for making choice between farm and non-farm sector, however, we extend it for choosing among nine different occupations.

Rest of the chapter is organized as under: in section 4.1 we develop a model of educational mobility. Section 4.2 explains the model of occupational mobility whereas section 4.3 discusses empirical methodology.

4.2 The Model of Educational Mobility

While discussing distribution of social outcomes, social scientists not only focus on the inequality in socio-economic status in different families of the same generation but also inequality in between different generations of the same family-the intergenerational mobility. How socio-economic status, education in our case, transfers from parents to the child generation? To answer this question, we follow the models developed by Becker and Tomes (1979), Loury (1981) and Becker et al. (2015) with special attention to human capital formation in the form of education attainment by the child.

Consider an economy with overlapping generations composed of large number of individuals. Each individual is supposed to live for two periods. An individual in the first period of his/her life (the child) is attached to a person who is in the second period of his/her life (the parent) and this union is called a "family". Each family maximizes utility in which parents are altruistic in the sense that they not only care their own utility but also care about the "quality" and "economic success" of their children in the form of income (Becker and Tomes, 1979). Parents can influence the income of children by investing in their human and non-human capital. So the utility of parents not only depends on their own consumption (c) but also on the expected utility of children as proposed by Becker et al. (2015):

$$V(Y^P) = U(c) + \alpha EV(Y^C) \qquad (4.2.1)$$

where Y^P and Y^C are income of parents and children respectively, $V(Y^P)$ is the total utility of parent, $U(c)$ is the utility of parent derived from consumption (c), α is the degree of altruism of parents towards their children where the value of α ranges from 0 to 1. $EV(Y^C)$ is the expected utility a child derives from his level of income Y^C in the

future. The current generation (parents) can increase their utility by consuming more at the expense of future generations (not investing on children). However, they are not doing so as they are altruistic towards their children and care about their utility. Children accumulate human and non-human capital in the first period of their life and then work, consume and produce their own children in the second period of their life.

Let Y_H^C is the amount invested by the parents in the human capital formation (education) of a child and τ is the cost of consumption forgone against each unit of Y_H^C, then budget constraint of parents can be written as

$$C + \tau Y_H^C = Y^P \tag{4.2.2}$$

By assuming that value of each unit of human capital accumulated in children is equal to w_H, the present value of this investment can be expressed as:

$$\tau Y_H^C = \frac{w_H Y_H^C}{1+r} \tag{4.2.3}$$

Where $(1 + r)$ is the discount factor. The level of$w_H$is determined by the factors that are not in the control of parents like stock of human capital in the economy, the stock of physical capital, technological progress etc.(Becker et al., 2015).Total income of a child (Y^C) is equal to the sum of income earned from[32] "human capital (Y_H^C)", "endowed capital (K^C)" and "labor market luck (L^C)" (Becker and Tomes, 1979) and can be expressed by the following equation:

$$Y^C = w_H Y_H^C + w_K K^C + w_L L^C \tag{4.2.4}$$

where $w_K$value of a one unit of the endowed capital and w_L is the monetary value of luck. Putting equations 4.2.4 and 4.2.3 into equation 4.2.2, we get the budget constraint of parent as:

[32] Apart from these, endowment of parents, degree of inheritability and the propensity of investment in children also determine the income of a child (Becker et al., 2015).

$$C + \frac{Y^C}{1+r} = Y^P + \frac{w_K K^C}{1+r} + \frac{w_L L^C}{1+r} \quad (4.2.5)$$

Parents maximize their utility (4.2.1) with respect to their consumption and expected income of their children subject to budget constraint (4.2.5). This provides the basis for intergenerational linkages between parental characteristics and human capital of children.

Apart from parental income, educational level of parent also contributes towards the human capital (level of education) of a child. Studies, like Lillard and Wallis (1994), Hausman and Szekely (1999), Lam (1999), Spielaure (2004), Azam and Bhatt (2015), have shown positive influence of parental education on the level of education of their children. Parental education influences the level of education of their children through different mechanisms.

First, generally income of the highly educated parent is also high which may positively affect the level of education of their children by relaxing financial constraint of the family. Moreover, since children are not legally obligated by their parents to pay back their educational loans, therefore income level of the parent determines the level of investment in children education. Second, educated parents may be more productive and efficient in child-enhancing activities which in turn may translate itself into higher educational attainment for the child. Third, bargaining power may be influenced by the level of education of parents in the household. Highly educated parents may be more successful in directing expenditures towards child-friendly activities and investments. Fourth, educated parents have greater concern for the education of children as compared to uneducated parents[33]. They are more likely to guide children in solving their homework and can better guide their children in complications of the school system

[33] Guryan et al. (2008) in a survey (American Time Survey) show that average time spent with children by educated parents is larger than the uneducated parents.

(Becker et al., 2015). Fifth, level of education of a child is influenced by the role model effects as children emulate the parental education (Emran and Shilpi, 2011). Sixth, children of highly educated parents have more ability to get higher level of education; reflecting the indirect effect of parental education on the level of education of their children.

Besides, decisions regarding the level of education of children are determined by the interaction of parental preferences and their financial constraints (Becker and Tomes, 1979; 1986 and Loury, 1981). It depends on the cost of education, return to education and income of the family (Sjogren, 2000; Black and Devereux, 2010). Parental educations not only directly influence the education of their children but also indirectly through the increase in income level. Policies that remove financial constraints help in increasing level of education of the children.

With this background, a general model of human capital formation of a child is given as:

$$H_{ij}^{C} = f(H_{ij}^{P}, Y_i^{P}, \mathrm{X}) \tag{4.2.6}$$

where H_{ij}^{C} is the j^{th}level of education of an i^{th} child, H_{ij}^{P} is the j^{th} level of education of parent of an i^{th} child, Y_i^{P} is income of the parent of an i^{th}child and X is the vector of other control variables including wealth, household size, age of a son, and geographic location.

The rational of inclusion of control variables is discussed below:

- Along with education and income of parents, wealth plays an important role in the education attainment of a son. Higher the value of wealth, higher will be the educational attainment. Wealth includes durables, value of lands, buildings,

animals and livestock etc. A family with high level of wealth may influence the level of education of their children through three different channels. First, higher wealth in the form of durables means that family has already met its needs and more income can be allocated to the education of children. Second, in the case of financial constraint (income shortage), a family with high wealth can liquidate its wealth and meet the cost of education of the children easily. Third, wealth, especially land, can be used as collateral for getting loan to finance education of children in case parents are facing financial constraints and unable to finance the educational expenses of children with the existing level of income.

- Household size is another variable which can affect the level of education of a child. Parents make optimal child-rearing decision based on both quality and quantity of the child (Becker, 1960). While quantity refers to the number of children, economists give number of explanations of quality. It can be human capital, education, wellbeing and social status. Resource dilution hypothesis postulates that resources of parents are finite, therefore, with the increase in number of children the amount of money, of time and patience that each child receives from its parents are diluted. This causes a reduction in parental investment per child. The chances of children to achieve higher level of education and thereby higher social status are reduced (Desai, 1995; Maralani, 2008). Economists call this negative relationship between family size and social status a quality-quantity trade-off (Maralani, 2008). Investments in the quality of a child decrease with the increase in family size, where quality, according to Becker (1991), is measured by the current as well as the future wellbeing of the children.

- Age of a child is another factor that can be used as a control variable. As age of a child increases, we expect increase in his/her level of education. Even if a child leaves education at some stage of his life and enters the job market still there are chances that he/she may improve his/her level of education in the later stage of his/her life. Further, different levels of education are completed at some specific level of age beyond which increase in age of an individual leads to decrease the chance of that level of education. Therefore, we also include age square along with the age of a child as an independent variable.
- The geographic location may be capturing, for example, availability and quality of schools across different provinces, and across urban-rural regions. It also captures the peer effects as well as the environmental effects. Qualities of rural educational institutions are not up to the level of urban educational institutions. Moreover, number of schools, teachers and other stocks availability are different in rural regions than the urban one. Generally distance from residence to schools and colleges are greater in rural regions than the corresponding distance in urban regions. In most of the urban regions, schools and colleges are available at door steps. Similarly, educational policies and facilities by the provincial/local governments are not same across the provinces. Cost of education, motivational policies of the government, scholarship policies and types of educational institutions are different in different regions (rural, urban and provinces). Moreover, in terms of reward to education, the markets of different regions are not equal therefore; level of motivation to invest in education of children is different in different regions.

With this background we can re-write equation (4.2.6) as:

$$H_{ij}^{C} = f(H_{ij}^{P}, Y_i^{P}, W_i^{P}, HS_i, A_i^{C}, R_R, P_p, P_S, P_B) \qquad (4.2.7)$$

where, W_i^P is the wealth of parent of i^{th}child, HS_i is the household size where i^{th}child lives, A_i^C is the age of i^{th}child, R_R equal to "1" if a child belongs to rural region and equal to "0" if he/she belongs to urban region. P_p, P_S and P_B are dummies for province Punjab, Sindh and Balochistan respectively. Province Khyber Pakhtunkhwa (KP) is used as reference province. In stochastic form, equation 4.1.4 can be written as:

$$H_{ij}^{C} = \beta_0 + \beta_1 H_{ij}^{P} + \beta_2 Y_i^{P} + \beta_3 W_i^{P} + \beta_4 HS_i + \beta_5 A_i^{C} + \beta_6 (A_i^{C})^2 + \beta_7 R_R$$
$$+\beta_8 P_p + \beta_9 P_S + \beta_{10} P_B + e_i \qquad (4.2.8)$$

where, $(A_i^C)^2$ is the square of age of i^{th} child and error term"e_i" captures the effects of all other omitted variables, for example, a channel of intergenerational educational mobility through genetic transmission and innate ability of a child, migration, government spending on education and structural change etc. on the level of education of a child.

A larger value of β_1 means strong linkage between education of parents and their children; indicating less mobility in educational status and vice versa. The impacts of family background variables, income and wealth, are captured by β_2 and β_3. The influence of household size on educational level of a child is captured by β_4. Negative value of $\beta_4$would indicate that with the increase in household size the chance of a child to get high level of education would reduce because of the dilution of resources. A positive value of β_5 and negative value of β_6 reflect non-linear relationship between level of education of a child and his/her age. It means that level of education is expected to increase with the increase in age of a child up to some age beyond that age the chance to achieve that level of education decreases with the increase in age. β_7 captures the effect

of rural-urban differences and β_8, β_9 and β_{10} capture the effects of provinces Punjab, Sindh and Balochistan, respectively.

4.3 The Model of occupational Mobility

To understand how different factors affect the occupational choice of a child, we follow the model proposed by Emran and Shilpi (2011). The model is a sort of extension to Becker and Tomes (1979, 1986) and Sjogren (2000)[34], which provides linkages between the occupational status of parent and occupational status of child generations. However, unlike Emran and Shilpi (2011), who use their model to make a choice between farm and non-farm sector, we have nine categories of occupations: (1) Elementary (ELO); (2) Plant and Machine Operators and Assemblers (PMO); (3) Craft and Related Trade Workers (CRW); (4) Skilled Agricultural, Forestry and Fishery Workers (AFW); (5) Service and Sales Workers (SSW); (6) Clerical Support Workers (CLK); (7) Technicians and Associate Professionals (TAP); (8) Professionals (PRF); and (9) Managers (MGR)[35]. These occupations are presented in ascending order from lowest to highest status occupations.

Each individual has to make choice among the above mentioned occupations. Let δ_{ij} is inherent ability that i^{th} individual is endowed with and captures the characteristics that are relevant for j^{th}occupation. For example, a higher value of δ_{iPRF} means that i^{th}

[34] In the model of Sjogren (2000), occupational choice of an individual depends upon economic resources, cost of schooling and uncertainty about ability of individual for occupation. Further, in this model occupation and education choices of an individual are influenced by family background in three ways; (1) economic resources that are available for investment in human capital, (2) cost of schooling and (3) family background related uncertainty about individual work and success in different occupations. Sjogren (2000) assumes that when an individual chooses occupation other than their parents' one uncertainty about ability increases. This causes risk averse children to choose occupations of their parents, and reluctant to choose unfamiliar occupations.

[35] Detail of these occupations are given in appendix-A and extensive detail can be seen in ILO, 2012 published by International Labour Organization (2012) and (PSCO-2015) published by Government of Pakistan, Pakistan Bureau of Statistics (2015).

individual is better suited for the job of professionals. The genetic endowment of a child innate ability (δ_{ij}) are likely to be correlated with those of parents (Becker and Tomes, 1979) and thus provides the basis for intergenerational linkages. However, δ_{ij} is not known with certainty. Every individual makes an estimate of innate ability after using all available relevant information.

Each individual is endowed with capital stock (k_i) along with innate ability. Capital stock of an individual includes human, financial, physical, and social capital. The higher value of capital stock raises the chance of getting a better job (Emran & Shilpi, 2007) and is influenced through (1) investment in child education and (2) transfer of financial and physical capital by the parents. Moreover, human capital of a child is influenced through the role model as children imitating parental education and occupation. Children learn by observing their parents at work and by informal training in parents' work place and acquire useful skills and experience (Emran & Shilpi, 2011).

An i^{th} individual starts working life with given level of capital endowment (k_i) and the estimate of ability ($\tilde{\delta}_{ij}$) and optimally chooses the occupation O_j where j = 1, 2, 3, ... , 9. Conditional distribution of income (Y_i) when individual chooses elementary occupation (ELO), is $F(Y_i \mid ELO; \Omega_i)$ where Ω_i is information set available to i^{th} individual, which also includes k_i and $\hat{\delta}_{ij}$ apart from other relevant information. $P(Y_i \mid ELO; \Omega_i)$ is the probability density function of income (Y_i) from elementary occupation.

The expected utility[36] of an i^{th} individual from choosing j^{th} occupation is given as:

$$V_i(O_{ij}, \Omega_i) \equiv \int U_i(Y_i) P(Y_i|O_{ij}, \Omega_i) dY_i$$

Similarly the expected utility from choosing m^{th} occupation is

$$V_i(O_{im}, \Omega_i) \equiv \int U_i(Y_i) P(Y_i|O_{im}, \Omega_i) dY_i$$

The individual chooses j^{th} occupation iff the following condition holds

$$V_i(O_{ij}, \Omega_i) - V_i(O_{im}, \Omega_i) \geq 0 \qquad \text{for all } j \neq m \qquad (4.3.1)$$

Preferences of children for occupations are likely to be correlated with the preferences of their parents. As a role model, parents influence the preferences of their children. This makes the basis for intergenerational linkages. Parental occupational choices are the main components of the information set available to children. It displays (1) information about innate ability also called genetic endowment of an individual and (2) information regarding the features of an occupation (Emran & Shilpi, 2011). Successfulness of parents in some occupation would lead the children to revise their estimation upward about their ability to be successful in similar occupation. Further, risk averse children will prefer to choose familiar parental occupation relative to other alternatives when uncertainty about parental occupation is reduced by revelation of information about parental occupation (Sjogren, 2000). Children are inspired by the success of parents, as indicated in the literature on cultural evaluation (Boyd & Richerson, 1985; Henrich & McElreath, 2003), and follow the tracks of their parents in choosing occupations.

The "role model effects" (Manski, 1993; Streufert, 2000) postulates that information revealed by parental choices can influence occupational choices of the

[36] Utility function is assumed to be concave which represents that individuals are risk averse.

children through their effects on the conditional distribution of income (Y_i). Consider a child who decides to participate in the occupation of professionals (PRF). Then according to parental role model the conditional distribution of income when parents are in "professionals" occupation $F(Y_i \mid PRF;\ PPRF; \Omega_i)$ dominant over the conditional distribution of income when neither of the parents is "professionals" $F(Y_i \mid PRF;\ NPPRF;\ \Omega_i)$, where $NPPRF$means that occupation of parent is other than "professionals".

This model also explains the gender dimension of intergenerational relationship of occupations. First, preferences of a child are transmitted through genes, so they have gender dimension. The preferences of a son (daughter) are more likely to be same as his(her) father (mother)as compared to that of his (her) mother (father). Second, there is gender dimension in role model effects. For a daughter, mother acts as a natural role model and learn more from her mother by doing and observing as she sees and hears primarily what her mother does and says. Similarly, for a son father is the natural role model. A son learn more from his father by doing and observing as the son sees and hears what his father does and says. Moreover, social network of the father might be more easily accessible to a son and that of mother's might be more easily accessible to a daughter. This gender effects contribute in occupational choices. The presence of gender dimensions in occupational choice says that the conditional distribution of income of a son from choosing j^{th} occupation "O_j" when father is also in j^{th} occupation "O_j^f" $F(Y_i \mid O_j;\ O_j^f\ ;\ \Omega_i)$ dominates the conditional distribution with mother in j^{th} occupation "O_j^m" ,$F(Yi \mid O_j;\ O_j^m; \Omega_i)$.

Keeping in view the above discussion, equation (4.3.1) is the basis for our econometric analysis. For estimation we assume following stochastic form of the model:

$$O_{ij}^{C} = \alpha O_{ij}^{P} + \acute{X}\gamma + \varepsilon_i \qquad (4.3.2)$$

where, O_{ij}^{C} is the j^{th} occupation of an i^{th} child, O_{ij}^{P} is the j^{th} occupation of parent of an i^{th} child, $\acute{X}$ is a vector of control variables, γ is the vector of parameters and ε_i is the stochastic error term. A brief discussion on the inclusion of control variables in the model is provided as under:

- Family background variables like income and wealth play important roles in the productivity enhancement of a child, which in turn influences his/her occupational status[37]. Apart from this indirect impact, income and wealth of a family also directly influence the occupational choice of a child through their concern regarding their status quo. Children who belong to rich and wealthy families would like to remain even jobless until they get high status occupations. For example a child of millionaire landlord would not like to choose elementary occupations like shoe cleaning, agricultural labour, street vendor etc. and he/she rather prefer to remain jobless or get a high status job[38]. Wealth (especially land) and un-earned income are also used as collateral to get capital which can be used for establishing high status personal business or for enhancing human capital (getting higher level of education or acquiring more skills). However, on the other hand it may also be argued that due to strong financial background of the parents,

[37] Detailed discussion on impact of income and wealth of a family on the human capital formation of a child is given in section 4.2.
[38] Especially in case of Pakistan.

children do not take interest in human capital accumulation as well as in lucrative jobs.

- Large family size and large children are considered as obstacle in success and achievements. Small family size increases investments in quality of child. Quality is measured by the current and future well-being of children, including their income when they become adults (Becker, 1991). There is negative relationship between family size and high status occupations, especially, for middle income and poor families a high family size declines the chances to maintain relatively high status occupations of their fathers (Van Bavel et al., 2011).The most important is the indirect effect of family size through human capital on occupational status. Larger family size reduces investment per child, especially in middle income families, which causes decrease in human capital accumulation and thereby reduces the chance of a child to get high status occupations.
- Level of education of an individual is a proxy for human capital. High level of education increases productivity and thus helps to achieve high status occupations. Efficiency and productivity play important roles in the recruitment, what we call "universalism" that social mobility through the principle of recruiting, selection of the most qualified person for the most important position (Blau and Duncan, 1967). Moreover, as mentioned by Lipset and Bendixt (1959), the roles of achieved characteristics are more important than the ascribed ones in the determination of status of an individual. On one hand educational level of an individual mediates in the family background and on the other hand it helps in the occupational outcome of an individual (Xie and Goytte, 2003).

- Along with level of education, age of a son is included as human capital variable representing work experience (Hauser, 1971). At the initial stage, an individual is less serious, takes time in searching for a good job and makes experiments in the job market. Age may also capture the labor market opportunities available at different time in different regions of the country. Further, it also capture the effect of any cohort (Emran and Shilpi, 2011).
- Access to j^{th} jobs may depend on the personal networks that often run along ethnic group. To capture the effect of ethnicity the best choice would be to include a set of dummies in the regression equation for different casts and ethnic groups. However, we use province wise and urban-rural distribution of personal networks. Inclusion of province and urban-rural level fixed effects will control the unobserved location-specific heterogeneity in choosing j^{th} occupation. Further, these region specific fixed effects also capture the peer effects, labor market opportunities available in different regions for different occupations and heterogeneity in access to labor markets.

In the light of above conceptual framework, equation (4.3.2) can be written as:

$$O_{ij}^{C} = \beta_0 + \beta_1 O_{ij}^{P} + \beta_2 Y_i^{P} + \beta_3 W_i^{P} + \beta_4 HS_i + \beta_5 H_{ij}^{C} + \beta_6 A_i^{S} + \beta_7 (A_i^{S})^2 + \beta_8 R_i^{R} + \beta_9 P_i^{P} + \beta_{10} P_i^{S} + \beta_{11} P_i^{B} + \varepsilon_i \quad (4.3.3)$$

where, Y_i^P and W_i^P are income and wealth of parent of an i^{th} child, HS_i is the household size where i^{th} child lives, A_i^C is the age of i^{th} child $(A_i^C)^2$ is the square of age of an i^{th} child. R_i^R equals "1" if a child belongs to rural region and "0" otherwise. Similarly P_i^P, P_i^S and P_i^B are dummies for provinces, Punjab, Sindh and Balochistan respectively.

Province Khyber Pakhtunkhwa is reference province. Error term "ε_i" captures the effects of all other omitted variables.

4.4 Methodology

Studies on intergenerational mobility of educational and occupational status mostly followed two approaches. First is the computation of transition matrix and second is the regression analysis. Section 4.4.1 discusses method of transition matrix. In section 4.4.2 we explain the methods of regression analysis along with statistical tests. Sections 4.4.2.1 provides details on ordered logit model (OLM) and section 4.4.2.2 discusses Brant test which tests the assumption of parallel regression required for the use of ordered logit model. Multinomial logit model (MNLM) is presented in section 4.4.2.3. Section 4.4.2.4 explains the Hausman test of the assumption of Independence of Irrelevant Alternatives (IIA) required for Multinomial logit model. Section 4.4.2.5 presents Likelihood Ratio test which tests the significance of a variable for all outcome categories of a dependent variable and finally section 4.4.2.6 discusses the likelihood ratio test of overall significance of a model.

4.4.1 Transition Matrix

Transition matrix is one of the earlier methods in which descriptive statistics are calculated that provide levels of attainment of socio-economic outcomes and also measure mobility of these outcomes across generations. It represents positions of the children relative to their parents and computes probability of a child being in a particular educational/occupational category given his parent's educational/occupational category. Transition matrices provide detailed information of movements in the stratification system. They provide information on opportunities for movement or barriers to

movement in the social structure and also compute the size, greater or less, of these opportunities. In this way they provide intimation about stratification processes in an economy. A number of researchers including Driver (1962), Erikson and Goldthorpe (1992), Cheng and Dai (1995), Biblarz et al. (1996), Behrman et al. (2001), Beller and Hout (2006), Louw et al. (2006), Majumder (2010) and Motiram and Singh (2012) have used this method in their studies.

Transition matrix faces a problem of floors and ceilings effects where less mobility can be seen for the extreme, top and bottom, categories. The reason for this problem is that if parents are at the top of the distribution, their children can only move downward and on the other hand if parents are at the bottom of distribution then their children can only move upward. Moreover, this method does not analyze the impact of other variables on the objective variable and thus does not show the causal relationship between parental status and the status of their children. This mobility may be due to the parents' characteristics and other socio-economic factors, which cannot be captured through the transition matrix. This is why further regression analysis is carried out.

4.4.2 Regression Analysis

Regression analysis is more rigorous method in which we can analyze the impact of other relevant control variables on the children educational/occupational status along with the parental educational/occupational status. In this method, the coefficients of parental characteristics (level of education and occupation) show intergenerational inertia. A higher value means low mobility and vice versa. Researchers like Duncan and Hodge (1963), Solon (1992), Gang and Zimmermann (2000), Sjogren (2000), Bowles and Gintis (2002), Bourguignon et al. (2007), Black et al. (2003), Nguyen and Getinet (2003), Hertz

et al. (2007), Emran and Shilpi (2011), Zijdeman (2008), Holmlund (2008),Girdwood and Leibbrandt (2009), Van Bavel et al. (2011) and Checchi et al. (2013)have used this method in their studies.

Both the dependent variables, level of education and occupational status, are categorical in equations 4.2.8 and 4.3.3. For education, we have seven categories while for occupational status, individuals have to choose among nine occupations. Therefore, our estimations are based on categorical models, namely, the "ordered logit" and the "multinomial logit" models.

4.4.2.1 Ordered logit Model

In ordered logit model (ORM), the values of the dependent variable just symbolize the ranking where a smaller value stands for low ranking and a larger value for higher ranking. However, unlike continuous variable, these values may not represent the actual numbers and may not represent the actual difference between these numbers. Ordinal dependent variable is coded in consecutive integers i.e. 1, 2, 3, … , Jaccording to the number of categories and violates the assumptions of linear regression model. Therefore, probit and logit versions of ordinal regression model, proposed by McKalvey and Zavoina (1975), are used. ORM is nonlinear and when there is a change in one of the independent variables the magnitude of a change in the outcome probability depends on the levels of all independent variables. This model assumes, for example in case of occupational status, that there is an observed ordinal variable O_i, which, in turn, is a function of an unobserved latent variable O_i^*. The latent variable is modeled as:

$$O_i^* = \alpha\, O_{ij}^P + \acute{X}_i\gamma + \varepsilon_i \qquad (4.4.1)$$

where, O_i^* is the i^{th}value of a latent variable. O_{ij}^P is the j^{th} occupation of parent of an i^{th} child and ε_i is stochastic error term. The latent variable, O_i^* assumes values j = 1, 2,..., J. For Jcategories, there will be J-1 cut-points. The observed response categories are linked to the latent variable by the measurement model as:

$$O_{ij}^C = \begin{cases} 1 & if \quad c_0 = -\infty \leq O_i^* < c_1 \\ 2 & if \quad c_1 \leq O_i^* < c_2 \\ \vdots & \\ J & if \quad c_{J-1} \leq O_i^* < c_J = \infty \end{cases}$$

So, the observed category changes when latent variable exceeds the cut point. Probability that i^{th} individual chooses category j, for given values of independent variables (Z), is given by

$$Pr(O_{ij}^C = j|Z) = Pr(c_{j-1} \leq O_i^* < c_j|Z) \tag{4.4.2}$$

where, Z is matrix of explanatory variables. Substituting $\alpha\, O_{ij}^P + \acute{X}_i\gamma + \varepsilon_i$ for O_i^* in equation (4.4.2) and rearranging we get the standard formula for predicted probability as

$$Pr(O_i = j|Z) = F(c_j - \alpha O_{ij}^P - \acute{X}_i\gamma) - F(c_{j-1} - \alpha O_{ij}^P - \acute{X}_i\gamma) \tag{4.4.3}$$

That is, probability that occupation(O_i) is equal to $j$is the probability that O_i^* takes the value between c_{j-1} andc_j. For the ordered logit $F(z) = \frac{1}{1+e^{-z}}$ is the logistic cumulative density function where z =$\alpha O_{ij}^P + \acute{X}_i\gamma + \varepsilon_i$and $var(\varepsilon_i) = \pi^2/3$.

The ordered logit with J categories not only estimates coefficients of regressors but also estimates (J-1) cut-points or threshold parameters. Coefficients of the regressors are same for all the outcome categories. However, the threshold parameters draw the boundaries of the various outcome categories. In other words, we have parallel regression lines and proportional odds. This means that coefficients that describe the relationship between the lowest versus all higher categories of the dependent variable are the same as

those that describe the relationship between the next lowest category and all higher categories. Using equation (4.4.2) and (4.4.3), ordinal regression model can be written as[39]:

$$Pr(O_{ij}^{C}, j = 1|Z) = F(c_1 - \alpha O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.4)$$

$$Pr(O_{ij}^{C}, j = m|Z) = F(c_m - \alpha O_{ij}^{P} - \acute{X}_i\gamma) - F(c_{m-1} - \alpha O_{ij}^{P} - \acute{X}_i\gamma)$$

For $m = 2$ to J-1 (4.4.5)

$$Pr(O_{ij}^{C}, j = J|Z) = 1 - F(c_{J-1} - \alpha O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.6)$$

Equations (4.4.4), (4.4.5) and (4.4.6) are used for calculating cumulative probabilities as:

$$Pr(O_{ij}^{C}, j \leq m|Z) = F(c_m - \alpha O_{ij}^{P} - \acute{X}_i\gamma) \text{ for } m=1 \text{ to } J\text{-}1 \quad (4.4.7)$$

4.4.2.2.Brant Test of parallel regression

Equation (4.4.7) shows that ordinal regression model is equivalent to J-1 binary regression with the assumption that slopes coefficients are identical for each regression and should not change for different categories. This means that correlation between dependent and independent variables remains same for all categories of dependent variable. If this assumption holds then regression lines for J-1 categories of J categorized dependent variable will be parallel. However, if this assumption violates there will be no parallelity between categories. In our occupational status model there are nine categories and for nine outcomes the equations are:

$$Pr(O_{ij}^{C}, j \leq 1|Z) = F(c_1 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.8)$$

$$Pr(O_{ij}^{C}, j \leq 2|Z) = F(c_2 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.9)$$

$$Pr(O_{ij}^{C}, j \leq 3|Z) = F(c_3 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.10)$$

[39] For $O_{ij}^{C}, j = 1$, $F(\alpha O_{ij}^{P} - \acute{X}_i\gamma) = 0$, and for $O_{ij}^{C}, j = J$, $F(\infty - \alpha O_{ij}^{P} - \acute{X}_i\gamma) = 1$

$$Pr(O_{ij}^{C}, j \leq 4|Z) = F(c_4 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.11)$$

$$Pr(O_{ij}^{C}, j \leq 5|Z) = F(c_5 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.12)$$

$$Pr(O_{ij}^{C}, j \leq 6|Z) = F(c_6 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.13)$$

$$Pr(O_{ij}^{C}, j \leq 7|Z) = F(c_7 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.14)$$

$$Pr(O_{ij}^{C}, j \leq 8|Z) = F(c_8 - \alpha\, O_{ij}^{P} - \acute{X}_i\gamma) \quad (4.4.15)$$

We have eight equations, the ninth is reference category. Each equation, from (4.4.8) through (4.4.15), has the same slope coefficients (α, γ). They are differing only in the intercepts. This is a strong assumption and can be tested through Brant test. The assumption of parallel regression, also called assumption of proportional odds, can be tested by comparing the estimates from the J-1 binary regressions. Null hypothesis of the Brant test is:

$H_0: \beta_1 = \beta_2 = \cdots = \beta_{J-1}$ (Assumption of parallel regression/proportional odds holds)

A Wald test developed by Brant (1990), separately tests parallel regression assumption for each independent variable. Rejection of null hypothesis would mean that assumption of parallel regression is violated and using ordered logit regression is inappropriate.

4.4.2.3 Multinomial Logit Model

We can use the Multinomial Logit Model (MNLM) if the assumption of parallel regressions is violated (Long and Freese, 2006). Multinomial Logit Model proposed by McFadden (1974), can be thought of as simultaneously estimating binary logits for all comparisons among the categories of the dependent variable. In MNLM, for each outcome of dependent variable we have different slope coefficients of the independent

variables. If there are J categories of a dependent variable (O), then dependent variable is observed as:

$$O_{ij}^{C} = \begin{cases} 1 \; if \; O_{ij}^{C} = j \\ 0 \; if \; O_{ij}^{C} \neq j \end{cases} \tag{4.4.16}$$

It means that if outcome j is observed then the remaining alternative outcome categories would be equal to zero. For each observation, only one of the alternatives will be non-zero. The Multinomial Logit Model can be written as:

$$ln\Pi_{m/b}(Z) = ln\frac{pr(O_{ij}^{C}=m|Z)}{pr(O_{ij}^{C}=b|Z)} = Z\beta_{m/b} \text{ for } m = 1 \text{ to } J \tag{4.4.17}$$

where, "b" is the base category and the log odds ($ln\Pi$) of this base category, compare to itself, is equal to $ln\Pi\, b/b = ln1 = 0$, therefore $\beta_{b/_b} = 0$. It means that effects of independent variables on reference category are zero. So one set of coefficients is normalized in this model (using it as base model) and all other sets of coefficients are interpreted relative to this base model. Therefore, for J outcomes of a dependent variable, we will have (J-1) sets of coefficients to interpret. For example, we have three alternatives occupations; A, B and C. And for simplicity we have an econometric model where occupational choice of a child depends upon occupational choice of his/her parent only as given below:

$$O_{ij}^{C} = \alpha + \beta O_{ij}^{P} + \varepsilon_i \tag{4.3.18}$$

we will have three binary logit as:

$$ln\left(\frac{pr(A)}{pr(B)}\right) = \alpha_{A/B} + \beta_{A/B}O_{ij}^{P}$$

$$ln\left(\frac{pr(C)}{pr(B)}\right) = \alpha_{c/B} + \beta_{C/B}O_{ij}^{P}$$

$$ln\left(\frac{pr(A)}{pr(C)}\right) = \alpha_{A/C} + \beta_{A/C}O_{ij}^{P}$$

where subscripts attached to the coefficients show the comparison categories. For example subscript A/B shows that comparison is being made between category "A" and category "B". With three categories, we have to make three comparisons. However, one of the information is redundant. If we compute information on two comparisons the third will be deducted from these two. As $ln\frac{A}{B} = \ln A - lnB$, then the following must hold:

$$ln\left(\frac{pr(A)}{pr(B)}\right) - ln\left(\frac{pr(C)}{pr(B)}\right) = ln\left(\frac{pr(A)}{pr(C)}\right)$$

This implies that $\alpha_{A/B} - \alpha_{C/B} = \alpha_{A/C}$ and $\beta_{A/B} - \beta_{C/B} = \beta_{A/C}$

In general, if there are J categories we need to estimate J-1 binary logits. From these J equations we compute the predicted probabilities. For example the predicted probability that an individual will choose m^{th} alternative for given value of Z is

$$\hat{P}r(O_{ij}^{C} = m|\mathrm{Z}) = \frac{\exp(Z\widehat{\beta}_{m|b})}{1+\sum_{j=2}^{J}\exp(Z\widehat{\beta}_{j|b})} \qquad (4.4.19)$$

The sum of probabilities of choosing each alternative sums up to 1.

The marginal effect of a change in explanatory variable (for example$x$) on the probability of selecting j$^{\text{th}}$ category is given by

$$\frac{\partial \Pr(O_{ij}^{C}=m|Z)}{\partial x_k} = \Pr(O_{ij}^{C} = m|Z)\left[\beta_{k,m|J} - \sum_{j=i}^{J}\beta_{k,j|J}\Pr(O_{ij}^{C} = j|Z\right] \qquad (4.4.20)$$

and the discrete change can be computed as

$$\frac{\Delta \Pr(O_{ij}^{C}=m|Z)}{\Delta x_k} = \Pr\left(O_{ij}^{C} = m\middle|Z, x_k = x_E\right) - \Pr(O_{ij}^{C} = m|Z, x_k = x_S) \qquad (4.4.21)$$

Unlike the coefficients from regression of multinomial logit, there would be as many marginal effects as there are categories.

4.4.2.4 Hausman test of Independence of Irrelevant Alternative (IIA)

Multinomial logit model requires the assumption of "Independence of Irrelevant Alternative (IIA)". This assumption says that adding or deleting outcomes (categories) does not affect the odds of the remaining outcomes (categories). In other words, the odds between two categories do not depend on the other available categories and that alternative categories are irrelevant for them. To test validity of this assumption, we use Hausman test. If there are J categories and assuming that model is estimated with the base category b, then J-1 tests can be computed by excluding each of the remaining categories to form the restricted model. The null hypotheses are:

H_0: odds (category j versus category i) are independent of other alternatives

To test this hypothesis, we first estimate the full model with all J outcomes and obtain unrestricted estimates of $\hat{\beta}_{UR}$. In the second step, we eliminate one or more outcome categories and obtain restricted estimates of $\hat{\beta}_R$. If $\hat{b}_{UR}$ is subset of $\hat{\beta}_{UR}$ after eliminating coefficients not estimated in the restricted model then

$$H = (\hat{\beta}_R - \hat{b}_{UR})' \left[\widehat{var}(\hat{\beta}_R) - \widehat{var}(\hat{b}_{UR})^{-1}\right] = (\hat{\beta}_R - \hat{b}_{UR}) \sim \chi^2_{(df)}$$

where degrees of freedom (df) equal to the number of rows in $\hat{\beta}_R$. We reject the null hypothesis if value of computed chi-square is greater than critical chi-square.

4.4.2.5 Likelihood Ratio (LR) Testing the effects of independent variables

Likelihood Ratio Test tests that all coefficients associated with given variable(s) are equal to zero. With J outcome categories of a dependent variable, there will be J-1 coefficient associated with each independent variable. The null hypothesis of the test is

$$H_0: \beta_{1|b} = \beta_{2|b} = \cdots = \beta_{J|b} = 0$$

where b is base category. As $\beta_{b|b} = 0$, therefore hypothesis impose restrictions on J-1 parameters. There will be as many tests as there are independent variables[40]. LR test, tests the hypothesis for independent variable (or for a category of independent variable if the variable is categorical) one by one. The test proceeds as:

In the first step, the original model is estimated and unrestricted likelihood ratio statistics LR^2_{UR} is obtained. In the second step, restrictions are imposed that all coefficients associated with a given independent variable are simultaneously equal to zero (in other words, drop this variable) and model is re-estimated to obtain restricted likelihood ratio statistics LR^2_R. Then the likelihood ratio test statistic is computed as

$$LR^2 = LR^2_{UR} - LR^2_R \sim \chi^2_{(J-1)}$$

We reject H_0 if computed value of LR^2 is greater than $\chi^2_{(J-1)}$ critical and conclude that all the coefficients associated with an independent variables are not simultaneously equal to zero.

4.4.2.6 Likelihood Ratio (LR) test of overall significance of a model

This test, tests the overall significance of the model. Under the null hypothesis we assert that all the slope coefficients associated with all independent variables are simultaneously equal to zero and the best model is to regress the dependent variable on constant only. In other words, the null hypothesis states that a good predictor of the dependent variable is its mean value. The null hypothesis can be specified as

$$H_0 = \beta_{x_2} = \beta_{x_3} = \ldots \beta_{x_k} = 0$$

[40] If an independent variable is categorical with k number of categories, then we have k-1 LR tests for that variable.

where β_{x_i} is vector of all slope coefficients associated with variablex_i. This test proceeds as under:

In the first step full model is estimated without any restriction and the maximum value of the likelihood (L_1) is obtained. Then the restriction is imposed that all the coefficients associated with the independent variables are equal to zero and the maximum value of the likelihood (L_0) is obtained. Finally, the chi-square statistics is computed as χ^2= -2$ln\lambda$, where $\lambda = \frac{L_1}{L_0}$. We reject H_0 if χ^2computed is greater than χ^2 critical and conclude that overall model is significant.

To achieve our objective, first we will compute transition matrices to examine the strength of educational/occupational mobility. Analysis based on transition matrices will be extended to urban, rural, provinces and urban–rural regions of all the provinces. After this, in order to estimate the impact of relevant variables on the educational and occupational mobility, we will estimate equations 4.2.8 and 4.3.3 by both ordered logit model and multinomial logit model. Then using the statistical tests (Brant test, Hausman test of IIA and Likelihood Ratio tests), we will choose between ordered logit model and multinomial model. Once model is estimated then we will compute the marginal effects. Estimations will be carried out for overall Pakistan, urban regions, rural regions and for all four provinces for both educational as well as for occupational attainments. This will not only help us to assess the strength of educational and occupational mobility in different regions but also will help us to understand the impact of other socio-economic variables on the educational and occupational mobility. Then comparing the results of educational mobility and occupational mobility, we will be able to infer whether educational mobility is adequately transformed to occupational mobility or not.

Chapter 5

DATA

5.1 Introduction

Data arean integral and important part of a research study. It assists in discovering the answers to research questions and also helps in future outcomes. To get reliable results, we need representative and quality data. If data is not representative, then there is possibility that some groups of the people have over-representation while others have under representation, thus causing biasedness in the results. Similarly, quality of the data has to be maintained not only during the collection but also after the collection of data.

The data source, the PSLM(2012-13), is discussed in section 5.2.The issues and limitations related to PSLM data are described in section 5.3. Extraction and selection of appropriate data for educational and occupational mobility is discussed in detail in section 5.4. Section 5.5 discusses the constructions of variables to be used in the analysis. Finally, section 5.6 summarizes the chapter.

5.2 Data Source- The PSLM survey

We utilize data of PSLM 2012-13. PSLM survey provides data on social and economic variables in the alternate years. The data are collected and monitored by the Federal Bureau of Statistics, Ministry of Finance. It is the most comprehensive and a

large survey in its nature which covers questions regarding education, health, occupation, income, possession of assets, services etc. at individual and household level. It is a more representative survey which covers the urban and rural regions of all the four provinces of Pakistan, the federal area (Islamabad), Azad Jammu and Kashmir (AJK), Federal Administrated Tribal Areas(FATA) and Northern areas (Gilgit and Baltistan)[41]. Data is collected from all districts of the four provinces. In the rural regions the sampling frame comprises the lists of villages/mouzas/dehaccording to Population Census of 1998. This sampling frame includes total of 50588 villages/mouzas/deh.The numbers of villages/mouzas/dehs set for sampling frame in rural regions of the country are: Punjab 25875, Sindhh 5871, Khyber Pakhtunkhwa7337, Balochistan 6557, AJK1654, Northern Area 566, FATA 2596 and Islamabad 132.Cities and towns of urban regions have been divided into enumeration blocks. There are 26698 enumeration blocks in sampling frame of the urban region and each enumeration block consists of about 200 to 250 households. The numbers of enumeration blocks for sampling frame of the country are: Punjab 14549, Sindh 9025, Khyber Pakhtunkhwa 1913, Balochistan 613, AJK 210, Northern Area 64 and Islamabad 324.

For stratification of population, the country is divided into urban and rural stratum. In urban regions, each of the large cities[42] constitutes a separate stratum. Then on the basis of low, middle and high-income groups each of these large cities is further divided into sub-stratum. In each district, the remaining urban population has been grouped together to form a stratum in each province. In Rural region, each district has been treated as an independent stratum in all the four provinces. 5438 sample villages and

[41] Military restricted areas are not included in the survey.
[42] These large sized cities include Islamabad, Lahore, Gujranwala, Faisalabad, Rawalpindi, Multan, Bahawalpur, Sargodha, Sialkot, Karachi, Hyderabad, Sukkur, Peshawar and Quetta.

enumeration blocks which comprise of 77764 households have been fixed as a sample size for the four provinces. However, 5411 villages and enumeration blocks and 75516 households could cover in the survey. The province-wise sample size covered in PSLM survey 2012-13 is summarized in Table 5.1:

Table 5.1: Villages / Enumeration Blocks Covered in PSLM Survey 2012-13

	Primary Sampling Units			Households		
Province	**Urban**	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Punjab	1133	1211	2344	12937	18979	31916
Sindh	696	711	1407	8122	11358	19480
KP	272	594	866	3133	9340	12473
Balochistan	205	589	794	2406	9241	11647
Pakistan	**2306**	**3105**	**5411**	**26598**	**48918**	**75516**

Data are collected through two-stage stratified sample technique during the survey. For the selection of Primary Sampling Units (PSUs)[43] from strata and sub-strata, Probability Proportional to size Sampling (PPS)[44] method of sampling technique has been used. In rural regions, for selection of sample PSUs village-wise population of 1998 census sampling frame have been treated as measure of size. In urban regions, enumeration block-wise numbers of households collected in 2002-03 renovation of sampling frame have been used as measure of size for selection of sample PSUs in urban strata. Next, households within these sample PSUs have been taken as Secondary Sampling Units (SSUs). For the selection of households, systematic random sampling

[43] Villages in rural and enumeration blocks in urban areas.

[44] In the first stage of PPS sampling, larger clusters have bigger probability of being selected. In the second stage, exactly same numbers of individuals are selected per cluster i.e. individuals in small clusters have bigger probability of being sampled. So overall, each individual in population has the same probability of being sampled.

technique has been used with a random start. Sixteen households have been selected from each rural sample PSU while twelve households have been selected as SSUs from each urban PSU. Finally, household level information is collected from each household head.

5.3 Issues and limitations of the PSLM survey data

Before proceeding and extracting data relevant to our study, it is important to highlight some important issues and limitations of data concerning our sample. To find rigorous estimates of intergenerational mobility in educational and occupational status, special and carefully designed surveys and samples are required that have information for parents as well as their adult children on education, occupation and other relevant variables. However, none of the existing surveys, including PSLM, is designed for the study of intergenerational mobility in Pakistan and hence the surveys suffer from some issues when used for this purpose.

First, the PSLM survey data are available for all the individuals living in a household[45]. Relationship of each individual with the head of household is also reported. On the basis of this information, we map the children's education/occupation viz-a-viz the education/occupation of his/her parent(s). It means that we can map only those children and parents who are living in the same household. Therefore, single member households, two-member households (husband and wife) and nuclear households (husband, wife and young children) are excluded from the analysis. Some geographical regions and socioeconomic groups (e.g. urban middle classes and the elite, who are more likely to live in nuclear families) may have a high share of such type of households.

[45] Data on some variables are available for all individuals; some information are available only for age 4 years and above individuals and information on some variables are available for individuals of age 10 years and above.

Therefore, they will be systematically underrepresented in the analysis. Similarly, as we are using co-residence father-son data, PSLM survey does not report information of the fathers who have died. Therefore, all those sons whose fathers have died earlier are not represented in our data set.

Secondly, PSLM data focus on the characteristics of co-resident children-parents; therefore, it misses information regarding intergenerational mobility in case of younger generations who are living out of the parents' residence. The co-resident household may have special characteristics that differ systematically from other households and therefore may cause biasedness in our mobility measures. However, the bias may be in either direction. On one hand, it is more likely that more educated and well established children leave the home of their parents. On the other hand, if the parents are less educated and not well established, the children are more likely to live with the parents in the same household in order to take care of them. Since these households are included in our sample, therefore it may cause to overestimate the degree of intergenerational mobility. The net bias could go in either direction. However, it is most likely that the co-residence data over represent the younger adults[46]. The elder sons (first-born sons) who complete their education, enter the job market and get marry earlier than younger (high-birth order) sons and leave the houses of their parents. They are likely to be under represented in our data. This will likely under estimate our mobility estimates.

Thirdly, in case of occupational mobility, current occupation of the individual is revealed in the PSLM survey. However, it is the life time occupation which is important for mobility measurement. The current occupation may be different due to migration,

[46] Our data of educational mobility show that 85% of the sons are within age of 16 to 30 years. The same is 89% in occupational data. So the percentages of sons above 30 years are only 15% and 11% in educational mobility and occupational mobility data respectively.

transitory shocks, promotions, retirement etc. from the life time occupation; therefore this would pose a problem.

Fourthly, though PSLM survey provides information regarding the relationship of individuals to the head of the household; however the survey does not report information regarding the fathers of married women, who constitute majority of the women. Once married, these women leave the home of their parents and live either in nuclear families or in joint families with their husbands and parents-in-laws. Their relationship with the head of household is either represented as wives or daughters-in-law. Therefore we cannot extract information of the parents of these married women. For women who are heads of households, the survey does not report any information on characteristics of their parents.

Fifthly, in our co-resident data for overall Pakistan, 84.36% of the mothers have never attended schools and their frequency in "post graduate" category is zero. The situation is even worse in KP and Balochistan where the percentage of mothers, who never attend schools, is 93.2% and 97%, respectively. In rural Balochistan, there is zero frequency of mother in "intermediate", "graduate" and "post graduate" categories. The level of education of daughters, more or less, depicts the same picture with slight improvement. The similar problems arise in case of occupations where female participation in job market is very low. Most of the women are working in low status and low paid jobs like agricultural workers and craft industry.

Due to these data problems, we drop female from our analysis and are limited to co-resident son-father data only to assess educational as well as occupational mobility.

The above mentioned issues in data are quite common in the studies of intergenerational mobility of educational and occupational status. However, despite these limitations and issues, the data of PSLM survey is more rich and representative of the household structure as compared to other available data in Pakistan. We can draw meaningful and insightful inferences on the intergenerational educational and occupational mobility in Pakistan on the basis of PSLM-2012-13survey.

5.4 Extraction of Relevant Data

For our analysis, we extracted the relevant information from various sections, like household roster, education, employment and possession of assets, of PSLM survey data[47]. It includes the characteristics of fathers and sons living in the same households. For education mobility, we select son-father pairs who have completed their education and are currently not enrolled in any educational institution. For this purpose, we select those individuals in our sample whose answer to the question "Is the person currently studying in any educational institution?" is "no". Then, we select only adults with age 16 years or above and drop all those who are under this age limit[48]. In our data set for educational mobility, age of the sons is falling in the range of 16-60 years. It implies that we have data on individuals born between 1952 and 1996. In the data of occupational mobility age of the sons is falling in the range of 16-66 years, implying that we have data on individuals born between 1946 and 1996.

[47] Questionnaire is available on line at http://www.pbs.gov.pk/content/questionnaire

[48] It also takes into account the two acts regarding the compulsory education age and minimum age for work. In Pakistan, compulsory education age is 16 years under section 3 of the "Right to Free and Compulsory Education Act", Government of Pakistan (2012). Minimum age for work is 15 under parts 1 and 2 of the "Schedule of the Employment of Children Act", Government of Pakistan (1991).

Separate data sets prepared for educational and occupational mobility are discussed below in section 5.4.1 and section 5.4.2, respectively.

5.4.1 Data for Education Mobility

In the roaster of PSLM data, information regarding relationship of individuals with the head of household, age, region (rural-urban) and province are available for492632 individuals of total 75516 households. Information on education is available for 445169 individuals with age equal to four years and above. After dropping all those individuals with age less than 16 years and keeping only children-parents data, we are left with 280194 observations. We then dropped all those individuals who are currently enrolled in educational institutions and selected only those who have completed their education or have never attended any institution. We also dropped educational category with option "other", which represents mixed education like religious, certificate, short diploma etc. From the remaining data, we extract information on 39989 co-resident fathers-sons. Once we identified co-resident fathers-sons with reference to levels of education, then data on remaining variables, like occupation, income, wealth etc., for the same father-son pairs were obtained from other sections of the survey.

5.4.2 Data for Occupation Mobility

In the PSLM survey, questions about occupation of an individual were asked from 356949 individuals with age equal to 10 years or above. We kept only those co-resident fathers and sons whose answer to the question "did...do any work for pay, profit or family gain during last month? was "yes" and dropped all non-working individuals. We also dropped all those individuals who are currently enrolled in any educational institution. Then we select only adult sons with age 16 years and above. Total co-resident

working fathers and sons who had completed their education career were 25241 in age group 16 years and above.

5.5 Construction of variables

Data available from PSLM are not directly fit for our analysis; rather we have to reconstruct the variables according to the requirement of our model. In the following we discuss definitions and constructions of relevant variables.

5.5.1 Educational Status

Information given in section-C of PSLM-2012-13 questionnaire is utilized to construct variable of education. Several questions have been asked from the respondents regarding their education. At the first step, we select all those individuals who responded to the question "What maximum education achieved?" In the second step, we drop all those individuals who are currently studying in any institution; this is to ensure that individual has completed his education career.

Originally 21 categories of different levels of education are framed, including "no education". We drop the category "other" which comprises mixed level of educations like short diploma, short certificate, religious education etc. Remaining 20 categories are recoded into 7 categories as follows:

(1) Never Attended School (NAS): NAS includes those individuals who never went to school. In our data set this category includes about 43 percent of the total fathers and sons.

(2) Up to Primary (PMY); this category includes all those individuals who have completed their level of education up to class five. In total data of education, this category includes 20.05 percent of the individuals (sons as well as fathers). Out of

these, approximately 72 percent of the individuals are those who have completed five years of education, while only 28 percent are those who left their schools before passing class five.

(3) Up to Middle (MDL); in this category, we include all those individuals whose level of education is greater than five but less than matric. 15.05 percent of the total sons and fathers fall in this category. Majority, approximately 73 percent, of the individuals in this category are those who completed class eight and nine.

(4) Matriculation (MTC); includes all those who have passed class ten. There are 12.8 percent sons and fathers in this category.

(5) Intermediate (INT); it includes FA, FSc., poly-technique diploma, CT and I.Com. This category includes 4.8 percent of the total sons and fathers.

(6) Graduation (GRD); this category includes BA, BSc, BCs and B.Ed. and constitutes 2.3 percent of the total observations on education for sons and fathers data

(7) Post-Graduation (PGR); this category, which is the highest level of educational status, includes MA, MSc, M.Ed., degree in engineering, degree in medicine, degree in law, degree in agriculture, MPhil and PhD. All these degrees representing higher education are combined together due to their smaller frequencies. We have only 2 percent sons and fathers in this category. Further classification of this highest category shows that 77.23 percent of the sons and fathers have MA, MSc and M.Ed. degree. 15.90 percent hold degree in medicine and degree in engineering, the remaining 6.86 percent hold degree in law, degree in agriculture, MPhil and PhD.

5.5.2 Occupational Status

Job is defined as a "set of tasks and duties performed or meant to be performed, by one person, including for an employer or in self-employment" (PSCO-15). Occupation is the kind of work performed in a job. ISCO-08 and PSCO-15 defines occupation as "set of jobs whose main task and duties are characterized by a higher degree of similarity". In PSLM survey, the structure and definition of Pakistan Standard Classification of Occupations (PSCO-1994), which is similar to International Standard Classification of Occupations (ISCO-1988), is adopted for the collection of data on occupation[49]. Under this classification, all the jobs are classified at four levels. At first level, all the jobs are classified into most detailed 390 unit groups. Based on skill level and skill specialization required for jobs, these 390 units are aggregated into 116 minor groups, 28 sub major groups and 10 major groups[50]. Based on four different levels of skill required for different occupations, these 10 major groups are then aggregated into four different skill levels.

In PSLM survey, data is available on 28 major groups with 2-digit codes. We merged these 28 major groups into 10 categories. These categories are:

(1) Managers (MGR): in this category 12.34% of the co-resident working fathers and sons fall.

[49]Currently ISCO-2008 classification is utilized by ILO which classifies all the jobs into most detailed 436 unit groups at first level, then these 436 units are aggregated into 130 minor groups, 43 sub major groups and 10 major groups. Pakistan also updated this classification in 2015 and call Pakistan Standard Classification of Occupation (PSCO-2015)

[50] Detail of these occupations is given in appendix-A. A more comprehensive detail can be seen in Government of Pakistan (2015). Pakistan Standard Classification of Occupations, Federal Bureau of Statistics, Islamabad. Similarly a comprehensive discussion on the classification of occupations is given in International Labour Organization (2012), International Standard Classification of Occupations-ISCO08, Vol (1)

(2) Professionals (PRF): there are approximately 1.5% of the observations in this category.

(3) Technicians and Associate Professionals (TAP): it includes approximately 3% of the total co-resident working fathers and sons.

(4) Clerical Support Workers (CLK): 1.8% of the observations are contained in this category.

(5) Service and Sales Workers (SSW): in this occupation 8% of the total co-resident working fathers and sons are engaged.

(6) Skilled Agricultural, Forestry and Fishery Workers (AFW): in this occupation highest number, 36%, of the fathers and sons are involved.

(7) Craft and Related Trades Workers (CRW): 9.5% of the co-resident fathers and sons are working in this category.

(8) Plant and Machine Operators and Assemblers (PMO): it includes 5.5% of the co-resident fathers and sons.

(9) Elementary Occupations (ELT): includes the second highest numbers, 22.3%, of the total working co-resident fathers and sons, and

(10) Armed force (ADF): there were only 73 observations in this category and was dropped from our analysis.

The above 10 major groups are further aggregated into four major groups on the basis of levels of skills required to perform tasks at different occupations. The relationship between these 10 major groups of PSCO-94 and 4 skill levels[51] are summarized in table 5.2.

[51] Skill represents the ability to carry out the duties and tasks of a given job. Skill level is the complexity and range of duties and tasks to be performed in an occupation.

Table5.2: Mapping of PSCO-94 Major Groups to Skill Level

PSCO-94 Major Groups	Skill Level
Managers	3,4
Professionals	4
Technicians and Associate Professionals	3
Clerical Support Workers	2
Service and Sales Workers	2
Skilled Agricultural, Forestry and Fishery Workers	2
Craft And Related Trades Workers	2
Plant and Machine Operators And Assemblers	2
Elementary Occupations	1
Armed force	1,2,3

Occupations at Skill level 1 involve the performance of routine physical and manual tasks. These occupations may require the use of hand-held tools or electrical equipment. In some job basic literacy or numeracy may be required but may not be a major part of the work. Skill level 2 occupations involve the performance of operating machinery, driving, maintenance and repairing of electrical and mechanical equipment and manipulation, ordering and storage of information. For occupations in skill level 2, ability to read information and performing arithmetical calculation is required. Occupations at skill level 3 involve the performance of technical and practical tasks which requires an extensive body of factual, technical and procedural knowledge in specialized field. These occupations require high level of literacy, numeracy and interpersonal communication skills. These skills are normally acquired at higher educational institutions. Occupations at skill level 4 perform the tasks that require complex problem solving, decision making and creativity based on an extensive body of

theoretical and factual knowledge in a specialized field. These occupations require high level of education. However, in some occupations on the job training and experience can be substituted for the formal education.

We exclude the 10th category i.e. Armed force from our analysis due to (1) smaller number of observations, (2) PSLM survey was not carried out in the armed force area, therefore the available observations may not be true representative of this category and (3) mixed rank individuals in this category but only one code is assigned to this category in PSLM data which does not distinguish among different rank jobs.

The respondent revealed the occupation he/she was employed in at the time of interview and interviewer assigned codes from group of 28 categories in whichever he or she fell. In present analysis, we excluded all those individuals who were not working at the time of interview and did not fall in any of the occupational category.

5.5.3 Income of Father (Y)

We use income earned from all sources by a father as a determinant of the educational and occupational status of a son. For this purpose the variable "total income" of a father is constructed by using information given in section-E (employment) of the questionnaire. Total income of a father is the sum of all kinds of income he receives from different sources. This includes income from the first major occupation, income from the second occupation (if any), income from other work or job done, income obtained by selling the kinds if wages are received in kinds, income from pension and other benefits, remittances received from within Pakistan and from abroad, rent form property (land and buildings) and any other kind of income received by individuals.

5.5.4 The Wealth Index (W)

Economic condition of a household is closely related to his level of material well-being. Different material needs are satisfied by different assets which come at prices, hence wealthier the households, the more likely they can satisfy these needs. Possession of assets, which satisfy material need and reflects living standard, help in assessing the material well-being of a household. Therefore, to assess the economic welfare of the households, information on asset ownership can be used by utilizing the close relationship between material and economic well-being (Sahn & Stiefel, 2003; Gwatkin et al., 2007; Howe et al., 2008).

The economic condition of household determines the most relevant assets meant for the material well-being of that household. Material well-being of a very poor household is associated with the satisfaction of basic needs like food, clothing and shelter. Extending this line of reasoning, material well-being then refers to the possession of all kinds of relatively cheap utensils like pots, pans, plates, cutlery, clocks, tables, chairs, carpets, sewing machines. Access to these basic assets makes life easier and more comfortable. Likewise, access to electricity is a major contributor to material wellbeing of a household. The time that can be spent on useful and leisure activities increases considerably with electric light. Daily shopping time is reduced by having a refrigerator at home. The time spent on cooking and other tasks around the home can be reduced by electric tools and utensils. Similarly fans, air coolers, air conditioners, washing machines and iron which run on electricity make life easy and comfortable. Radio and TV bring the world into the drawing room and phones, computers and the internet greatly increase

communication and access to information. Access to clean water reduces workload of the household and saves a considerable amount of time spent on fetching water.

The quality of the house or the place of residence is another important aspect of material well-being. The kind of building and flooring material determines as to how much maintenance there is and how comfortable the house is. More rooms per person, a better and decent kitchen and facility of the toilet considerably increase the quality of living. In addition, transportation and communication equipment greatly enhances the material wellbeing. With a bike, car, tractor and truck etc., travelling and transportation of heavy loads becomes easier and considerable time is saved.

As wealth is a multi-dimensional variable, therefore we construct a wealth index (W). It includes twenty consumer durables[52], access to two public utilities (water and electricity) and four housing characteristics (number of sleeping rooms, quality of floor material, quality of wall material and toilet facility), the source of cooking fuel and the type of phone used for communication (land line, mobile or both). Apart from these, possession of personal agricultural land, possession of animals for milking and transportation, possession of chickens and poultry and livestock, non-agriculture land, property or plot, residential building and shop, commercial building in personal possession are also included. This set of assets is selected on the basis of information availability in PSLM survey.

Any household for which the required asset information is available can be given a value on wealth index (W). The consumer durables included in the construction of WI are measured with two-category variables. These variables have value "1" if the

[52] Possession of iron, fan, sewing machine, chair/table, radio or cassette player, watch, TV, VCR/ VCP/VCD, refrigerator/freezer, air cooler, air conditioner, computer/ laptop, phone or mobile, bicycle, motor cycle, car, tractor/ truck, cooking range, stove and washing machine.

household owns the durable and value "0" if does not hold durable. Room per person is obtained by dividing number of rooms in a house by family size. Floor and walls of a house are reported in four different categories. Six different types of toilets, nine sources of water, seven sources of cooking fuel, five types of lightning (access to electricity) and four options of communications are given in the questionnaire. We measured quality of floor material, wall material, toilet facility, water supply, cooking fuel, sources of lighting and sources of communication with three categories; value "1" for low quality, value "2" for middle quality, and value "3" for high quality. Sale value of agricultural land, animals, sheep, goats, poultry and live stocks, non-agricultural plot or land, residential building, shops and commercial buildings are reported by the responders. We aggregate all these into a single value.

Before construction of the wealth index, we convert all the variables (binary, three categories and continuous variables) into standardized normal taking value between "0" and "1". For estimating the weights, we use Principal Component Analysis (PCA). PCA is a multivariate statistical technique that reduces the number of variables in a dataset by converting them into a smaller number of components; each component being a linear weighted combination of the initial variables (Vyas& Kumaranayka, 2006). The first component, which explains the largest part of the variation in the data, is chosen as the wealth index (Filmer & Pritchett, 2001; Sahn & Stifel, 2003; McKenzie, 2005). PCA estimates a weight for each initial variable, and these estimated weights form the basis for computing the wealth index. The weights reflect the possibility that a household who owns a specific asset also owns some other assets. The coefficient of any one variable is related to the information it provides about the other variables. If ownership of one type

of asset is highly indicative of ownership of other assets, then it receives a positive coefficient. If ownership of an asset contains almost no information about what other assets the household owns (its correlation coefficient is near zero), then it receives a coefficient near zero. In contrast, if ownership of an asset indicates that a household is likely to own few other assets, then it receives a negative coefficient. Higher and lower coefficients mean that ownership of that asset conveys more or less information about the other assets.

To obtain the raw wealth score, we multiply asset weights by the asset indicator variables and then sum up. We obtain a household wealth distribution with a minimum score of -6.3 and a maximum score of 12.88. For more conceivable and meaningful interpretation, we transform the wealth distribution[53] to the range 0-100, with taking value of 0 for households who own none of the consumer durables; have no electricity, lowest quality water supply, poor floor and wall material and toilet facility, and taking value of 100 for households who own all consumer durables, have supply of electricity, highest quality of water supply, good floor and walls material and toilet facility, and have three or more sleeping rooms, having both mobile phone and landline, and holding maximum of the livestock, animals and all types of properties.

5.5.5 Household Size (HS)

Household size means the number of individuals living in household. Information on household size is collected from the roaster of PSLM. The average household sizes are 8.03 and 8.04 for educational and occupational mobility data, respectively. However, the

[53]This new scale was created by formula:

$$Wealth\ Index = \frac{Wealth\ Score\ of\ an\ Individual - Minimum\ Wealth\ Score}{Maximum\ score - Minimum\ Score} X100$$

average household size for all 75516 households is 6.52. The distribution of household is given below:

In the data of educational (occupational) mobility, 9.61% (8.07%) of the households are of small size (4 or less members), 39.16% (39.22%) are medium sized households (5 to 7 members), 34% (36.05%) are large sized households (8 to 10 members) and remaining 17.23% (16.65%) of the households are of largest size (more than 10 members)[54]. The minimum household size is 2 and the maximum household size is 59 in both educational and occupational mobility data. We use household size as a continuous variable rather than categorizing it into small, medium, large and largest household size.

5.5.6 Age (A)

PSLM data reports date of birth as well as age in number of years of all the members of a household. We use reported age in years for age of a son. In the data of educational mobility, average age of the sons is 24.15 year with minimum age of 16 year and maximum of 66 year. In the data of occupational mobility, the average age of sons is 23.35 years with 16 years and 60 years are the minimum and maximum age, respectively.

5.5.7 Region(R)

PSLM reports the residence of individual at province level, district level and rural-urban level. As there are too many districts and data in each district is not sufficient for our analysis, therefore, we group individuals into:

[54] The same figures are 11.83%, 42.1%, 29.64% and 16.43% for small size, medium size, large size and largest size households in the total sample of 75516 households.

- urban-rural to find differences in educational and occupational mobility in the urban and rural regions and
- provinces to assess educational and occupational mobility in different province.

For rural-urban we introduce a dummy variable which takes value "1" if rural and "0" otherwise. While for provinces, we introduce four dummy variables for Punjab, Sindh, Balochistan and KP. KP is taken as reference province.

5.6 Summary

This chapter discusses the household level survey, Pakistan Social and Living Standards Measurement (PSLM-2012-13) in detail, as well as the extraction of relevant variables and their constructions. PSLM is carefully designed survey at household level which covers all districts and rural-urban regions of the country. For the sample, a two stage stratified sampling technique is utilized. In first stage, villages/mouzas/deh and enumeration blocks are randomly selected and then households are randomly selected from each of these blocks. Total 75516 households are selected out of which 48918 belongs to rural regions and 25598 to urban regions. Selection is made from 3105 villages/mouzas/deh in the rural regions and 2306 enumeration blocks in urban regions. Finally, information on 492632 individuals has been collected from the heads of these 75516 households.

We extract the relevant data from PSLM on co-resident son-father pairs for educational and occupational mobility. For educational mobility, we select only those sons and fathers who have completed their education career. However, we also drop non-working sons and fathers from our data on occupational mobility. In both educational and

occupational mobility, the minimum age is set to 16 years and we drop all individuals below 16 years.

Data on our relevant variables is not readily available from PSLM; rather we have to construct these variables by utilizing the relevant sections of the PSLM survey. To construct variable of "educational status" we merge 20 different levels of education attainment into 7 categories. In case of occupations, we merge 28 different occupations into 9 categories for the construction of "occupational status" variable. Family income is constructed by aggregating income earned from all sources. Principal Component is used to construct wealth index that includes possession of durables, animals and livestock, structure of house, source of cooking fuel, types of phone used for communication, access to public utilities, agricultural land, buildings and shops etc. Information on other variables like household size, age and region (rural-urban and four provinces) is directly available in the roaster of PSLM data and does not need any further construction.

Chapter 6

RESULTS AND RESULTS DISCUSSION

6.1 Introduction

Due to its suitability for our research topic, we utilize data of PSLM-2012-13 for analysis. It comprises information on most of the variables required for our analysis. The survey covers sample from almost all the areas of Pakistan which will help us in generalizing results and recommending policy measures to practitioners. We carry out analysis for whole Pakistan as well as for different regions (rural, urban and provinces). Our results comprise of descriptive statistics, transition matrices and regression analysis. Under descriptive analysis, the percentage distribution of sons and fathers are computed in different educational and occupational categories. This will help us in assessing the frequencies of fathers and their sons in different categories; and in evaluating their socio-economic status i.e. high status, medium status and low status. Secondly, we evaluate transition matrices which help in finding the socio-economic status of current generation (the sons) relative to the past generation (the fathers). We will report the summaries of transition matrices to find intergenerational mobility (both upward and downward) as well as immobility or persistence[55]. Moreover, we will also compute the conditional probabilities of sons to fall in different categories of socio-economic status given the socio-economic status of their fathers using transition matrices. This will help in assessing the educational and occupational status of a son relative to his father and the chances open to both sons of the high and low status fathers.

[55] Our analysis will assess only absolute mobility.

Finally, we will utilize the results of regression analysis to assess the importance of other variables along with education (in case of educational mobility) and occupation (in case of occupational mobility). Since in both cases (analysis of educational mobility and occupational mobility) our dependent variable is categorical, so we use categorical logit model. On the basis of Brant test of parallel regression assumption (or proportional odds ratio assumption) and Hausman (or Small-Hasiao) test of Independence of Irrelevant Alternatives (IIA), we will decide the model (ordered logit or multinomial logit) to be used in our estimation. However, both the methods report the chances of sons to fall in different categories given the father category and thus help to analyze mobility of the current generation along with the importance of other relevant variables. The rest of the chapter is organized as under:

Educational mobility is discussed in section 6.2. We compute descriptive statistics and discuss the percentage distribution of fathers and sons in different levels of education in section 6.2.1. We also report average years of schooling of fathers and sons in the same section. Educational mobility calculated by using transition matrices is discussed in section 6.2.2. This section also discusses conditional probabilities of son to fall in different level of education given the level of education of a father. Regression based analysis of educational mobility is presented and discussed in section 6.2.3. Section 6.2.4 summarizes the results of educational mobility. Section 6.3 starts the analysis of occupational mobility. The sub-section 6.3.1 reports the percentage distribution of fathers and sons in different occupations. Results based on transition matrices for occupational mobility are discussed in section 6.3.2. This section also discusses the conditional

probabilities. Estimation and analysis of occupational mobility are documented in section 6.3.3. Finally, section 6.3.4 summarizes the results of occupational mobility.

6.2 Educational status of son and father

In this section, we discuss the structure of educational attainments by fathers and sons and intergenerational mobility in this status. For descriptive statistics and transition matrices, we require only the level of education of fathers and their sons and there is no need for other information. We have 39989 observations on co-resident father and son pairs with minimum age of a son equal to 16 years. Only those individuals are included in the analysis who have completed their education career and currently are not enrolled in any educational institution. Based on these 39989 observations, we present descriptive statistics of educational status and transition matrices of educational mobility in sections 6.2.1 and 6.2.2, respectively. Further, in section 6.2.3, results of regression analysis are presented and section 6.2.4 provides the summary of educational mobility to conclude the section.

6.2.1 Descriptive Statistics

In descriptive statistics, we report the percentage distribution of individuals in different levels of education. Here we do not compute mobility and association between level of education of fathers and sons. The objective is only to report percentages of sons and fathers fall in different levels of education independently. It will help us in understanding the nature of data which is useful in further analysis. Apart from percentages, we also report average years of schooling of fathers and sons. The percentage distributions of sons and fathers in different levels of educational and average years of schooling in different areas are given in table 6.2.1.

Table 6.2.1: Percentage Distribution of Educational Attainments

Level of EDU.	Father					Son				
	Pakistan Overall									
	Pakistan	KP	Punjab	Sindh	Baloch	Pakistan	KP	Punjab	Sindh	Baloch
NAS	58.4	65.6	50.5	52.9	77.5	27.6	22.0	20.8	32.5	38.5
PMY	17.5	11.8	18.8	23.6	10.6	22.6	18.6	22.3	21.7	26.8
MDL	9.4	7.8	13.7	6.9	4.8	20.7	23.4	28.7	12.7	13.1
MTC	9.0	10.2	11.6	8.4	3.9	16.6	21.2	16.9	15.5	14.9
INT	2.8	2.7	2.8	3.6	1.5	6.8	7.8	5.9	10.1	4.0
GRD	1.4	1.1	1.3	2.1	0.9	3.2	3.7	2.9	4.4	1.7
PGR	1.5	1.0	1.4	2.5	0.8	2.5	3.4	2.5	3.1	1.1
AYS	3.51	3.19	4.13	3.98	1.89	6.22	7.00	6.58	6.13	4.93
Pakistan Urban										
NAS	39.9	54.6	37.0	33.3	59.4	15.2	17.9	13.6	16.5	16.4
PMY	19.7	12.2	21.2	21.9	13.5	17.9	15.1	18.9	15.8	22.1
MDL	13.5	9.8	15.3	13.3	9.2	23.7	25.9	29.2	16.4	16.4
MTC	15.6	16.5	16.5	15.5	10.4	21.1	19.6	20.4	21.3	25.2
INT	5.3	4.9	4.6	7.3	2.5	10.7	10.4	8.2	15.3	9.4
GRD	2.7	1.2	2.6	3.7	2.0	6.0	5.5	4.8	8.1	5.9
PGR	3.3	0.9	2.8	5.0	2.9	5.5	5.6	4.9	6.6	4.6
AYS	5.28	4.42	5.51	5.88	4.72	7.86	7.85	7.73	8.23	7.38
Pakistan Rural										
NAS	67.0	69.3	58.9	64.2	80.9	33.3	23.4	25.3	41.8	42.6
PMY	16.5	11.7	17.3	24.6	10.1	24.7	19.8	24.4	25.1	27.7
MDL	7.4	7.1	12.7	3.2	4.0	19.3	22.5	28.3	10.6	12.5
MTC	6.0	8.1	8.5	4.3	2.7	14.7	21.7	14.8	12.2	12.9
INT	1.6	1.9	1.6	1.5	1.3	5.1	6.9	4.4	7.1	3.0
GRD	0.8	1.0	0.6	1.2	0.7	1.8	3.1	1.7	2.2	1.0
PGR	0.7	1.0	0.5	1.0	0.4	1.1	2.6	1.1	1.1	0.4
AYS	2.54	2.72	3.12	2.56	1.52	4.43	6.68	5.74	4.57	4.37

Source: Author's own calculations based on PSLM -2012-13. AYS = Average years of Schooling NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate.

Table 6.2.1 depicts that percentages, of both sons and fathers, are higher in lower levels of education and lower in higher levels of education in all the regions. For example, in overall Pakistan 70.9% of the sons are below matric. The percentage in matric and above level of education is 29.1%. The same figures for fathers' data are 85.3% for below matric and 14.7% for matric and above level of education. The distributions are more concentrated towards lower education (below matric) in Balochistan (92.9%) followed by KP (85.5%), Sindh (83.4%) and Punjab (83%) for fathers and Balochistan (78.4%) followed by Punjab (71.8%), Sindh (66.9%) and KP (64%) for sons

Situation of rural regions is even worse than urban regions. Rural population is more skewed towards low level of education as compared to the urban population, both for current generation (the sons) as well as for the past generation (the fathers). Data reveal that 90.9% of the fathers and 77.3% of the sons fall in below matric level of education in rural region as compared to 73.1% of the fathers and 56.8% of the sons in the same category in urban regions. However, in both urban and rural regions, the percentages of sons in matric and above level of education (43.3% in urban and 22.7% in rural) are greater than the percentages of fathers (26.9% in urban and 9.1% in rural) in this category of education. This shows that situation of educational attainment was worse in the father generation in rural region which is still worse for the son generation but improving.

Figures of overall Pakistan, provinces separately and rural-urban regions, reveal that percentages of sons as well as their fathers are higher in low level of education. However, the percentages of sons are relatively greater than that of fathers' in higher

level of education and smaller in lower level of education. The overall average year of schooling of sons (6.2) is greater than the average year of schooling of fathers (3.5). The same averages are 7.9 years for sons and 5.3 years for fathers in urban regions and 5.3 years for sons and 2.5 years for fathers in rural regions. This gives some insights of improvement in education level in all the regions for sons' generation. The sons' generation is getting more education than fathers' generation indicating upward mobility in educational status of sons relative to their fathers. Average year of schooling (7 years) is largest in KP for the sons' generation, followed by Punjab (6.58years), Sindh (6.13 years) and Balochistan (4.93 years). However, urban Sindh is leading the average year of schooling in both sons' generation (8.23 years) and fathers' generation (5.88 years). In rural regions, average year of schooling of fathers' generation (3.12 years) is larger in Punjab followed by KP (2.72 years), Sindh (2.56 years) and Balochistan (1.52 years) and the average year of schooling of sons' generation is larger in KP (6.68 years) followed by Punjab (5.74 years), Sindh (4.57 years) and Balochistan (4.37 years).

Upshot of above table 6.2.1is that most of the population in Pakistan is stuck to low level of education. This is true for all provinces as well as for urban and rural regions. It is also true across the generations i.e. the fathers and the sons. However, sons are progressing towards the higher level of education. Their frequencies in the higher levels of education are more than that of their fathers in all the regions. Further, average year of schooling of the sons is greater than the average year of schooling of the fathers in all the regions. This indicates that the sons' generation is getting mobility towards higher level of education.

6.2.2 Transition Matrices

Though descriptive statistics guide us to know the percentage distributions of fathers and their sons in different level of education but it does not help us to know the educational attainment of a son relative to his father. In other words, descriptive statistics only portrait the concerned variables separately for the two generations but do not report the position of son with reference to father i.e. whether he falls in the father's category or off the father's category? Transition matrix answers this question. It reports the distribution of sons in different levels of education relative to the level of education attained by their fathers. When we talk about educational mobility, our first question is whether son falls in the educational category of his father? If answer is yes, then educational status of a son depicts persistence or immobility. However, if answer is no, then there is educational mobility in either direction; upward mobility or downward mobility. Transition matrix reports the proportion of sons in different educational level as a function of level of education of their fathers. Figures in diagonal of transition matrix, which represent the proportions of sons and fathers fall the in same levels of education, represent immobility. However, off diagonal figures represent the proportion of sons whose levels of education are different from that of their fathers.

Based on objectives of our study, we computed fifteen transition matrices for educational mobility. However, reporting all of these matrices will consume a lot of space, therefore we only report their summaries below in table 6.2.2. We summarize 7x7 figures matrices into three figures[56] representing downward mobility, immobility and upward mobility. Immobility or persistence is the sum of the diagonal figures of the transition matrix where sons and fathers fall in the same categories of educational levels.

[56] Each figure in the matrix is the percentage of the total observation.

Table 6.2.2: Educational Mobility – Summary of Transition Matrices

Region	Son-Father		
	Downward Mobility	Immobility	Upward Mobility
Pakistan - Overall	12	36	52
KP- Overall	9	29	62
Punjab - Overall	13	32	55
Sindh - Overall	14	39	47
Balochistan - Overall	6	44	50
Pakistan -Urban	16	29	55
KP -Urban	12	26	62
Punjab -Urban	17	29	54
Sindh-Urban	18	30	52
Balochistan-Urban	9	27	64
Pakistan -Rural	10	39	51
KP -Rural	8	30	62
Punjab -Rural	12	34	54
Sindh -Rural	12	44	44
Balochistan -Rural	5	47	48

Source: Author's own calculations based on PSLM -2012-13

Sum of the figures up and to the right of diagonal represent upward mobility. Downward mobility is the sum of the figures to the left and down of the diagonal figures. Results are summarized in the table 6.2.2.

Table 6.2.2 reports educational mobility for overall Pakistan, provinces, urban and rural regions. Results show that along-with strong persistence in educational attainment an upward mobility can be observed in all the regions. A higher proportional of sons achieved higher levels of education relative to their fathers. Results depict that educational mobility is high (in either direction) in urban regions than the rural areas as a whole as well as in all four provinces. At province level highest mobility can be found for KP (62%) followed by Punjab (55%), Balochistan (50%) and Sindh (47%). Highest

upward mobility can be observed in Balochistan urban[57] (64%) and smallest for Sindh rural (44%). Rural regions as a whole, as well as rural regions of all provinces depict more persistence than urban regions. 39% of the sons fall in the fathers' educational categories in rural Pakistan while in urban Pakistan the same figure is 29%. A strong persistence (immobility) is observed in Balochistan rural (47%) and Sindh rural (44%) regions.

Results of table 6.2.2 suggest upward mobility in educational status, that is, on average; the educational status of a son is higher than educational status of his father. Results also show that urban regions exhibit more upward mobility relative to rural regions[58]. Similar results are found by Girdwood and Leibbrandt (2009), for South Africa. Our results are also consistent with the findings of Majumder (2010) and Azam and Bhatt (2015), who found upward mobility in educational status for India.

Next we would like to answer the questions like what is the probability that a son will get the high levels of education given that his father is in low level of education? Or conversely what is the probability of a son to move towards low levels of education given that his father is in high level of education? Or what is the chance for a son to attain the same level of education as his father attained? To answer these questions, we compute conditional probabilities; that is the probabilities of a son to fall in different levels of education given the education level of his father. Results are summarized in table 6.2.3.

[57] Upward mobility in Baluchistan should be interpreted in a great caution. A higher upward mobility in Baluchistan does not mean that its performance is better relative to other provinces, rather it shows that educational level of fathers in Baluchistan is too low (75.8% never attended school) therefore because of the floor problem with the transition matrix we get a higher percentage of upward mobility in Baluchistan.

[58] However, at the same time downward mobility is also larger in the urban regions as compared to the rural regions. The reason might be that relatively a larger number of fathers are in high levels of education in urban regions so there is more chance for the sons to get education less than their fathers.

Table 6.2.3: Educational Mobility-Conditional Probabilities

Level of Education Of Fathers	Level Of Educational of Sons						
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_F
Pakistan Overall							
NAS_F	38.91*	23.91*	18.12*	12.86*	3.99*	1.31*	0.89*
PMY_F	15.72*	24.94*	25.39*	20.62*	8.27*	3.14*	1.92*
MDL_F	9.24*	15.83*	30.64*	25.74*	10.75*	4.48*	3.31*
MTC_F	5.57*	9.83*	21.7*	31.1*	14.63*	9.57*	7.6*
INT_F	3.87*	6.27*	14.48*	27.19*	20.99*	14.87*	12.32*
GRD_F	3.26*	3.96*	7.68*	20.14*	17.35*	21.89*	25.73*
PGR_F	2.16*	2.04*	5.05*	11.66*	19.47*	20.43*	39.18*
Pakistan Urban							
NAS_F	28.23*	21.87*	23.34*	16.68*	6.21*	2.17*	1.5*
PMY_F	10.75*	21.13*	27.25*	22.91*	10.34*	5.19*	2.43*
MDL_F	7.99*	13.98*	29.71*	26.66*	11.71*	5.42*	4.54*
MTC_F	4.79*	8.82*	19.05*	30.74*	15.58*	11.52*	9.5*
INT_F	3.13*	3.88*	13.78*	24.81*	22.68*	17.92*	13.78*
GRD_F	2.28*	2.28*	4.55*	17.69*	16.29*	25.04*	31.87*
PGR_F	1.37*	0.85**	3.58*	9.39*	17.58*	22.53*	44.71*
Pakistan Rural							
NAS_F	42.43*	24.59*	16.4*	11.6*	3.25*	1.03*	0.69*
PMY_F	18.72*	27.23*	24.27*	19.24*	7.02*	1.91*	1.61*
MDL_F	10.39*	17.56*	31.52*	24.88*	9.87*	3.61*	2.17*
MTC_F	6.58*	11.15*	25.15*	31.57*	13.39*	7.03*	5.13*
INT_F	5.07*	10.14*	15.62*	31.03*	18.26*	9.94*	9.94*
GRD_F	5.21*	7.29*	13.89*	25.00*	19.44*	15.63*	13.54*
PGR_F	4.07*	4.88*	8.54*	17.07*	23.98*	15.45*	26.02*

Note: where* P < 0.01, ** P < 0.05, *** P < 0.1. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F = father, _S= Son

Value in each cell of the matrix is computed by dividing frequency of the cell by the sum of that row[59]. The row sum equal to 100% which represents the distribution of sons in different levels of education, given the level of education of fathers. Results show high persistence in both left and right tails of the distribution of overall data. Consistent with the literature, immobility is much higher in the extreme cells i.e. "never attend school" and "post graduate" level of education. Values in the principal diagonal are higher than the values of off diagonal in most of the cases representing persistence in level of education. We observe the "education trap", that is, highly educated (and less educated) people are more likely to pass on the same level of educational status to their sons.

Results show that a son whose father is in "never attend school" has 38.91% chance to fall in the same "never attend school" category. His chance to move to the highest level of education (post graduate) is only 0.89%. Similarly, high rigidity can be observed in the upper tail of the educational distribution. Probability of a son to attain maximum level of education is 39.18% given that his father has also attained maximum level of education and his probability to fall in lowest level of education (never attend school) is only 2.16%. A panoramic view of the table suggests that though there is persistence in educational attainment but on average the chance of a son to achieve same level of education as his father did or more is higher than his chance to lag behind the father's educational level. Our findings are in compliance with the earlier findings by Javed and Irfan (2015). Results of Labor (2011) for China also depict similar pattern but relatively more mobility is observed in his study for the lowest category (primary level of education).

[59] Sum of a particular row represents the total number of fathers in a particular level of education.

Rural and urban data presents different patterns. While rigidity is more at higher level of education in urban regions, we observe a higher persistence in the lower level of education in rural regions. For example in urban regions the probability of a son to remain in "never attend school" is 28.23% whose father is also in "never attend school", while the same probability is 42.43% in rural regions. Their probabilities to attain the highest level of education are 1.5% and 0.69% in urban and rural regions, respectively. Probabilities of sons to attain the "post graduate" level of education given that their fathers also attain "post graduate" are 44.71% and 26.02% in urban and rural regions, respectively. Similarly, their probabilities to fall in "never attend school" category are only 1.37% and 4.07% in urban and rural regions, respectively[60]. While urban data reflects an upward mobility in "Graduate" category, rural data exhibits downward mobility for the same level of education.

Our results are align to Javed and Irfan (2015), who find the similar results for urban and rural regions except for "Graduation". Their results for "Graduation" reveal a larger persistence in rural region while more downward mobility in the urban region. From the table 6.2.3 and tables B1, B1, B3 and B4 given in Appendix-B, it is evident that the chances of a son to fall in maximum levels of education are increasing with the increase in education of father. On the other hand the chances of a son to attain low levels of education are increasing when a father is also in low level of education. This shows that chances are not same for all the sons in Pakistan. Those who born in families with

[60] Moreover, results given in appendix-B table B1, B2, B3 and B4 also show that son of a father who "never attend school" in rural Sindh has the highest probability (54.5%) to fall in the same "never attend school", while in KP urban this probability is the smallest (26.02%). The probability of attaining maximum education by a son if father is in "never attend school" category is maximum in KP urban (2.99%) and minimum in rural Punjab (0.32%).

high educated fathers are more likely to reach and attain the high levels of education as compared to those who born in the families where fathers are uneducated or less educated.

From the results of tables 6.2.1 through 6.2.3, we conclude that there is persistence in educational level in Pakistan. Chances are not equal for all. Sons of highly educated fathers have more chances to get high levels of education as compared to the sons of less educated fathers. However, on average sons' generation is getting improvement in their educational status relative to the fathers' generation. Table 6.2.1 shows that larger numbers of sons are falling in high levels of education as compared to the fathers. Further, average year of schooling of the sons is greater than the average year of schooling of the fathers. Similarly, table 6.2.2 depicts that upward mobility in education is higher than the downward mobility. Moreover, results also show a significant persistence in the level of education. Finally it is also confirmed by the results presented in table 6.2.3 that chances of a son to get low (high) level of education are increasing (decreasing) when his father is also in low level of education. On the other hand, when father is in high level of educational category the chances for his son to attain high (low) levels of education are increasing (decreasing). This shows a sort of persistence in educational status i.e. sons imitate fathers. However, the results also show that overall probabilities of sons to get higher levels of education are greater as compared to the education level of their fathers which reflects that status of sons increase in terms of educational attainment as compared to their fathers.

6.2.3 Educational Mobility Based on Regression Analysis

So for we have related the educational status of a son to that of his father without bringing the role of other variables into the picture. In this section, we present results based on categorical logit estimation method which incorporates other relevant variables along with the educational level of father. Before estimating model by Multinomial Logit Model (MNLM), we first estimate the educational attainment of son by Ordered Logit Model (OLM). Results of OLM are given in Table B5in Appendix-B. Results show that educational status of sons is strongly linked to the educational status of their fathers. The log odd ratio in favor of high level of education of son increases as the father level of education increases, suggesting the existence of non-linearity in the intergenerational mobility of education. However, results of Brant test, given in the same table B5, rejects the assumption of parallel regression (proportional odd ratio) which is essential for using ordered logit model. Therefore, our next choice is multinomial logit to assess intergenerational mobility[61]. In this model the effects of independent variables are allowed to vary across the categories of dependent variables, which is helpful in our case to assess the mobility. Before interpreting the results of multinomial logit model, we first discus the statistical validity and reliability of using multinomial logit model in terms of Hausman test and likelihood ratio test shown in table 6.2.4.

Table 6.2.4 reports a number of statistical tests. First we test the assumption of "Independence of Irrelevant Alternatives" (IIA) by Hausman test, given at the top panel of the table. There are seven tests of IIA. The first test in row "NAS" is computed by re-estimating the model using the largest remaining category as base category. The other six tests correspond to excluding one of the six non base categories. In all seven cases, we do

[61] Mare (1980) also uses multinomial logit model in his study for US.

Table 6.2.4: Testing Validity of Multinomial Logit Model -Education

Hausman Test Of IIA			
Edu_S	χ^2	**df**	**P>chi2**
NAS_S	49	75	0.99
PMY_S	80	74	0.31
MDL_S	60	75	0.90
MTC_S	-24	74	-
INT_S	61	74	0.87
GRD_S	-38	74	-
PGR_S	28	74	1.00
LR Test for Independent Variables			
Ind. Variables	χ^2	**df**	**P>cha2**
PMY_F	879	6	0.0
MDL_F	821	6	0.0
MTC_F	1566	6	0.0
INT_F	907	6	0.0
GRD_F	815	6	0.0
PGR_F	1074	6	0.0
Income	37	6	0.0
Wealth	4498	6	0.0
H. Size	154	6	0.0
Age	992	6	0.0
Age Sq.	697	6	0.0
Rural	89	6	0.0
Punjab	697	6	0.0
Sindh	324	6	0.0
Balochistan	188	6	0.0
	LR chi2(84)	=	**22512.31**
	Prob > chi2	=	**0.0**
	Pseudo R2	=	**0.1604**

Note: Edu_S=Education level of a son. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F= father, _S= son

not reject the null hypothesis which means that assumption of IIA is not violated. For two categories, "MTC" and "GRD", we have negative values of the χ^2 test statistics, which according to Hausman and McFadden (1984) is evidence that assumption of IIA is not violated.

Likelihood Ratio (LR) test, given at the second panel of the table, tests that all coefficients associated with given variable(s) are equal to zero. We have fifteen LR tests for our model. Results of all these tests show that we can reject the null hypothesis for all independent variables. For example, we reject the hypothesis that coefficients associated with primary school education of father (PMY_F) simultaneously equal to zero for all outcome categories. In other words, we reject the hypothesis that effect of primary school education of father on all level of education of son is simultaneously equal to zero. Based on LR tests, our results show that all the variables have simultaneously statistically significant effect on all levels of education of sons. So there is no "irrelevant variable" in our model. Finally, Likelihood Ratio (LR) test given at the lower panel of the table, tests the overall significance of the model. The value of Likelihood Ratio (LR) statistics 22512.31 with p-value equal to 0.00 tells that overall model fits significantly better than a model with no explanatory variable.

Now it is evident from the above results that assumptions required for the use of multinomial logit model are met and it is good fit on the basis of statistical and econometric grounds for our analysis. We present marginal effects of educational status attainment of sons calculated from multinomial logit estimates[62] for overall Pakistan data in table 6.2.5.

[62]The multinomial logit estimates (log odds ratios) are given in appendix-B, table B6.

In table 6.2.5, level of education of a son is the dependent variable and the estimates are obtained for the data of overall Pakistan. Most of the coefficients are highly significant except few. We report marginal effects in our analysis because they provide more meaningful interpretation. It shows the impact of a unit change in the value of a regressor on the probability of different categories of dependent variable, holding values of all other variables constant. Size of the coefficient indicates the strength of impact of a change in regressor on dependent variable and the sign shows the direction of this impact. Now consider first row of table 6.2.5, if education level of father increases from never attend school to primary school, the probability of a son to remain in never attend school decreases by 16.19 percentage points and probability to attain primary education increases by 2.51 pecentage points. Similarly, probabilities of a son to attain middle, matric, intermediate, graduate and post graduate levels increase by 4.2, 5.23, 2.63, 1.13 and 0.48 pecentage points, respectively, if father is switching from never attend school toprimary school. When education of father increases to middle level from never attend school, the probabilities of a son to remain in never attend school or attain primary education decrease by 17.67 and 3.3 pecentage points, respectively,while probabilities to achieve middle, matric, intermediate, graduate and post graduate levels of education increase by 6.5, 7.79, 4.01, 1.6 and 1.04 pecentage points, respectively. Similarly, the probabilities of a son to remain in never attend school or move to primary education decrease by 20.61 and 7.2 pecentage points, respectively, when his father is moving from never attend school to matric level of education. Probabilities of a son increase by 1.43, 12.96, 6.44, 4.32 and 2.68 pecentage points, to achieve middle, matric, intermediate, graduate and post graduate level of education respectively when level of education of a

Table 6.2.5: Educational Mobility (Marginal Effects) - Overall Pakistan

	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F	**-0.1619***	**0.025***	**0.042***	**0.0523***	**0.0264***	**0.0113***	**0.0048***
	(0.0054)	(0.0060)	(0.0060)	(0.0056)	(0.0037)	(0.0025)	(0.0022)
MDL_F	**-0.1767***	**-0.033***	**0.065***	**0.0779***	**0.0401***	**0.0160***	**0.0104***
	(0.0072)	(0.0074)	(0.0075)	(0.0071)	(0.0047)	(0.0030)	(0.0026)
MTC_F	**-0.2061***	**-0.072***	**0.0143****	**0.1296***	**0.0644***	**0.0432***	**0.0268***
	(0.0074)	(0.0074)	(0.0075)	(0.0078)	(0.0052)	(0.0036)	(0.0028)
INT_F	**-0.2241***	**-0.1012***	**-0.0183**	**0.1163***	**0.1186***	**0.0683***	**0.0404***
	(0.0127)	(0.0125)	(0.0126)	(0.0134	(0.0103)	(0.0067)	(0.0048)
GRD_F	**-0.1873***	**-0.109***	**-0.0701***	**0.0845***	**0.0948***	**0.1024***	**0.0851***
	(0.0208)	(0.0178)	(0.0155)	(0.0172)	(0.0123)	(0.0096)	(0.0075)
PGR_F	**-0.1902***	**-0.139***	**-0.0843***	**0.0200**	**0.1410***	**0.1047***	**0.1475***
	(0.0248)	(0.0191)	(0.0173)	(0.0173)	(0.0158)	(0.0106)	(0.0103)
Income	**-0.0042***	**-0.002**	**0.0022***	**0.0025***	**0.0009***	**0.0002*****	**0.0002***
	(0.0012)	(0.0011)	(0.0008)	(0.0006)	(0.0003)	(0.0001)	(0.0001)
Wealth	**-0.010***	**-0.0027***	**0.0023***	**0.0043***	**0.0022***	**0.0016***	**0.0022***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
H. Size	**0.0026***	**0.0032***	**0.00005*****	**-0.0030***	**-0.0012***	**-0.0006****	**-0.0011***
	(0.0006)	(0.0006)	(0.0006)	(0.0005)	(0.0004)	(0.0003)	(0.0002)
Age	**-0.0193***	**-0.0172***	**-0.0065***	**0.0102***	**0.0088***	**0.0113***	**0.0128***
	(0.0016)	(0.0017)	(0.0018)	(0.0017)	(0.0012)	(0.0010)	(0.0010)
Age Sq.	**0.0003***	**0.0002***	**0.0001*****	**-0.0001***	**-0.0001***	**-0.0002***	**-0.0002***
	(0.00003)	(0.00003)	(0.00003)	(0.00003)	(0.00002)	(0.00002)	(0.00002)
Rural	**-0.0369***	**-0.0019**	**0.0044**	**0.0202***	**0.0087***	**0.0001**	**0.0054***
	(0.0053)	(0.0051)	(0.0046)	(0.0043)	(0.0030)	(0.0022)	(0.0021)
Punjab	**0.0276***	**0.0664***	**0.0405***	**-0.0574***	**-0.0328***	**-0.0134***	**-0.0308***
	(0.0058)	(0.0057)	(0.0061)	(0.0056)	(0.0038)	(0.0027)	(0.0028)
Sindh	**0.0609***	**0.0287***	**-0.0805***	**-0.0336***	**0.0280***	**0.0133***	**-0.0168***
	(0.0063)	(0.0060)	(0.0062)	(0.0064)	(0.0048)	(0.0034)	(0.0033)
Baloch	**0.0190***	**0.0548***	**-0.0652***	**0.0135*****	**-0.0113****	**0.0083****	**-0.0191***
	(0.0063)	(0.0064)	(0.0066)	(0.0072)	(0.0050)	(0.0042)	(0.0040)
Constant	**0.2602***	**0.2036***	**0.2033***	**0.1790***	**0.0762***	**0.0406***	**0.0370***
	(0.0019)	(0.0020)	(0.0019)	(0.0019)	(0.0013)	(0.0009)	(0.0008)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses. NAS=never attend school PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

father changes from never attend school to matric level.

Similarly, when father is switching from never attend school to intermediate level of education, the probabilities of son in below matric levels of education are decreasingwhile his probabilties to attain matric or above level of education are increasing – with maximum increase of 11.86 percentage points in intermediate level. Probaility of a son to remain below matric is decreasing when father is moving to graduate level and probabilities to attain matric and above are increasing with the maximum increase of 10.24 pecentage points to attain the graduate level. Finally, when father is moving towards highest level of education the probability of a son to attain college and university education is increasing with relatively larger value (with largest of 14.75 pecentage points increase in the probability of son to attain the highest level of education).

The above findings[63] exhabit elements of both the persistence (immobility) and upward mobility in level of education.From the results,we can see that upto midle level of education the increase in probabilities are larger for the sons in the levels of education higher than the levels of education of fathers (upward mobility). However, in matric and above levels of education, the increase in probabilities are larger for the levels of education where both sons and fathers fall (immobility or persistence). It means that there

[63] We also use education of mother as a control variable. Results are given in table B13, Appendix-B. Due to limited variation in education of mother we divide mother into three categories; (1) never attend school, (2) below matric and (3) matric and above. Results show that increase in the level of education of mother increases the probability of a son to move to higher level of education. Results also indicate that increase in the probability of son to attain up to matric level of education when mother is advancing to "below matric" level of education is higher than when mother is advancing to "matric and above" level of education. However, results also reveal that increase in the probability of son to attain above matric level of education when mother is advancing to "matric and above" level of education is higher than when mother is advancing to "below matric" level of education. These results show a persistent in educational level; that it is more likely for a son to achieve higher level of education when his mother is more educated.

is upward mobility when fathers are in lower levels of education. However, at higher levels of education there is more persistence.

Our findings are different from Nguyen and Getinet (2003) in the sense that they find more mobility, relative to our findings, up to intermediate level of education for US and show more persistence and downward mobility at graduate and post graduate levels. Our results are consistent with the findings of Azam and Bhatt (2015) for India. However, they use education as a continuous variable in their analysis. Our results contradict with the findings of Girdwood and Leibbrandt (2009) for South Africa astheir results show relatively more mobility except at the highest level of education. While we find more persistence at the highest level of education, results of Girdwood and Leibbrandt (2009)show downward mobility at that highest level of education.

Income of a father, which is used to invest in human capital of children, has the expected sign. Probabilities of achieving higher levels of education are increasing with the increase in income and their probabilities to remain in never attend school or to attainlow level of education (primary school) are decreasing. This shows that sons of the rich families have greater chances to move to higher levels of education as compared to the poor families. Apart from fathers' income, wealth of the family is also causing to increase the chance of getting high level of education. As our wealth variable includes durables, agricultural land, business property, livestocks etc, these can be liquidated, if needed, to finance education. Thus the wealthier the families the greater is the chance of their children to get high level of education.

The sign of household size confirms the resource dilute hypothesis and the child quality-quantity trade off. The negative sign for middle and above education show that

with the increase in household size, the probabilities of getting higher levels of education are decreasing. It is due to the fact that when number of children increases the time and money spent per child by parent decreases which causes them to stay at low level of education. As money does not matter very much at primary and middle level of education, therefore with the increase in number of children, the probability of children to attain primary and middle level of education increases as evident from the positive sign of the marginal effect with the variable of family size against the primary and middle levels of education of son. Similarly, probability of never attend school also increases with the increase in household size. However, education is expensive at higher levels therfore it becomes harder for parents to finance educational expenditure of their children, specially when they are more in number, so their chances to get higher level of education reduce. Similar findings are found by Nguyen and Getinet (2003) for US.

Increase in age of a son increases his probabilty to move to higher level of education and reduces the chance to stay in low level of education as evident from the positive signsof the coefficents of age at matric and above level and negative signs for below matric level of education. The net effect of age and its square maintain the same signs for age variable that the probabilities to remain in never attend school, primary and middle levels of education decrease and probabilities to attainmatric and above levels of education increase with the increase in age of a son[64].

Regional variables; rural-urban and provinces are used to control for regional hetrogeniety as the education facilities, education policies and priorities are differnt at different regions. Results also confirm that change in probabilities considerably vary

[64] Net effect of age variable is computed as $\frac{\partial ed\_sn}{\partial Age} = \beta_5 + 2\beta_6\overline{Age}$, where $\overline{Age}$ is the average years of sons in different levels of education.

across the regions. For the sake of comparision, we estimate separate regressions for rural-urban regions as well as for all four provinces. Results of urban and rural regions are given in tables 6.2.6 and 6.2.7, respectively.

Both the tables 6.2.6 and 6.2.7 report marginal effects computed for both urban and rural regions[65]. Comparing results of the urban regions to the results of rural regions we can be observe following differences when father is switching from "never attend school" to higher levels of education.

(1) Increase in probabilities that sons would attain the same levels of education of their fathers are higher in rural relative to urban regions, up to the intermediate level and the same increase in probabilities are higher in urban relative to rural region, for graduate and post graduate levels of education.

In urban region, when father is moving from "never attend school" to any higher level of education, the increase in probabilities of sons are either maximum in the levels of education where both son and father fall or the increase in probabilities are maximum that son would fall in higher level of education than father. However, in the rural region, when father is moving from "never attend school" to college or university levels of education (intermediate, graduate or post graduate) increase in probabilities are maximum for a son in lower levels of education than the father's level of education.

(2) Results of urban regions indicate that though there is strong persistence in educational but upward mobility can also be observed in both lower and higher levels of education. However, in rural regions we observe persistence up to matric level and downward mobility at college and above levels of education.

[65] Odd ratios are given in Appendix-B, table B7 and B8 for urban and rural regions, respectively.

Table 6.2.6: Educational Mobility (Marginal Effects) -Urban

	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F	-0.1207*	0.007***	0.0141	0.0380*	0.0286*	0.0290*	0.0040
	(0.0076)	(0.0090)	(0.0105)	(0.0105)	(0.0079)	(0.0061)	(0.0053)
MDL_F	-0.1226*	-0.0365*	0.034*	0.0549*	0.0286*	0.0209*	0.0207*
	(0.0088)	(0.0098)	(0.0118)	(0.0115)	(0.0084)	(0.0060)	(0.0059)
MTC_F	-0.1426	-0.0663*	-0.041*	0.0950*	0.0519*	0.0611*	0.0420*
	(0.0085)	(0.0094)	(0.0109)	(0.0115)	(0.0083)	(0.0064)	(0.0056)
INT_F	-0.1445*	-0.1096*	-0.0564*	0.0598**	0.1062*	0.0941*	0.0502*
	(0.0143)	(0.0138)	(0.0171)	(0.0177)	(0.0144)	(0.0110)	(0.0083)
GRD_F	-0.1258	-0.1102*	-0.1497*	0.0443**	0.0712*	0.1432*	0.1271*
	(0.0224)	(0.0200)	(0.0185)	(0.0230)	(0.0169)	(0.0155)	(0.0127)
PGR_F	-0.1371*	-0.1445*	-0.1405*	-0.0377***	0.1091*	0.1431*	0.2076*
	(0.0245)	(0.0184)	(0.0216)	(0.0215)	(0.0197)	(0.0164)	(0.0160)
Income	-0.0037*	-0.0054*	0.0046*	0.0026*	0.0011*	0.0004***	0.0004**
	(0.0019)	(0.0019)	(0.0011)	(0.0009)	(0.0004)	(0.0002)	(0.0002)
Wealth	-0.0078*	-0.0047*	-0.0003	0.0029*	0.0032*	0.0026*	0.0041*
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0002)
H. Size	0.0025*	0.0057*	0.0001	-0.0030*	-0.001***	-0.0020*	-0.0022*
	(0.0007)	(0.0008)	(0.0009)	(0.0009)	(0.0007)	(0.0006)	(0.0005)
Age	-0.0197*	-0.0223*	-0.0172*	0.0113*	0.0119*	0.0161*	0.0199*
	(0.0021)	(0.0024)	(0.0029)	(0.0030)	(0.0024)	(0.0022)	(0.0021)
Age Sq.	0.0003*	0.0003*	0.0002*	-0.0002*	-0.0002*	-0.0002*	-0.0003*
	(0.00004)	(0.00004)	(0.00005)	(0.00005)	(0.00004)	(0.00003)	(0.00003)
Punjab	0.0028	0.0659*	0.0333*	0.00003	-0.0349*	-0.0229*	-0.0442*
	(0.0083)	(0.0086)	(0.0111)	(0.0107)	(0.0084)	(0.0071)	(0.0071
Sindh	0.0227**	0.0194**	-0.0672*	0.0139	0.0277*	0.0112	-0.0276*
	(0.0089)	(0.0089)	(0.0113)	(0.0114)	(0.0094)	(0.0077)	(0.0075)
Baloch	-0.0261*	0.0429*	-0.0963*	0.0563*	0.0119	0.0287*	-0.017***
	(0.0097)	(0.0110)	(0.0129)	(0.0151)	(0.0123)	(0.0114)	(0.0105)
Constant	0.1503*	0.1586*	0.2208*	0.2163*	0.1101*	0.0731*	0.0708*
	(0.0027)	(0.0029)	(0.0034)	(0.0034)	(0.0026)	(0.0021)	(0.0019)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses. NAS=never attend school PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son

Table 6.2.7: Educational Mobility (Marginal Effects) -Rural

	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F	**-0.1829***	**0.0362***	**0.0578***	**0.0578***	**0.023***	**0.0031**	**0.005****
	(0.0072)	(0.0079)	(0.0073)	(0.0067)	(0.0040)	(0.0021)	(0.0020)
MDL_F	**-0.2119***	**-0.0290***	**0.0788***	**0.0896***	**0.051***	**0.0155***	**0.006****
	(0.0103)	(0.0104)	(0.0097)	(0.0093)	(0.0063)	(0.0035)	(0.0025)
MTC_F	**-0.2513***	**-0.0796***	**0.0559***	**0.1471***	**0.073***	**0.0356***	**0.0192***
	(0.0110)	(0.0108)	(0.0107)	(0.0111)	(0.0074)	(0.0047)	(0.0033)
INT_F	**-0.2832***	**-0.0844***	**0.0006**	**0.1509***	**0.1162***	**0.0559***	**0.044***
	(0.0181)	(0.0198)	(0.0188)	(0.0205)	(0.0156)	(0.0099)	(0.0078)
GRD_F	**-0.2345***	**-0.1005***	**0.0126**	**0.0965***	**0.1004***	**0.0759***	**0.049***
	(0.0312)	(0.0276)	(0.0272)	(0.0252)	(0.0184)	(0.0133)	(0.0097)
PGR_F	**-0.2272***	**-0.1184***	**-0.0350**	**0.049*****	**0.1509***	**0.0762***	**0.104***
	(0.0389)	(0.0320)	(0.0292)	(0.0270)	(0.0249)	(0.0152)	(0.0150)
Income	**-0.0046***	**-0.0001**	**-0.0004**	**0.0038***	**0.0011***	**0.00001****	**0.0003****
	(0.0016)	(0.0014)	(0.0011)	(0.0008)	(0.0004)	(0.0003)	(0.0001)
Wealth	**-0.0112***	**-0.0016***	**0.0034***	**0.0049***	**0.0021***	**0.0012***	**0.0012***
	(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
H.Size	**0.0031***	**0.0015**	**0.0004*****	**-0.0031***	**-0.0014***	**-0.0001***	**-0.0004***
	(0.0008)	(0.0008)	(0.0007)	(0.0006)	(0.0004)	(0.0002)	(0.0002)
Age	**-0.0194**	**-0.0144***	**-0.0008**	**0.0095***	**0.0075***	**0.0084***	**0.0093***
	(0.0023*	(0.0023)	(0.0022)	(0.0020)	(0.0014)	(0.0010)	(0.0010)
Age Sq	**0.0003**	**0.0002***	**0.00002**	**-0.0001***	**-0.0001***	**-0.0001***	**-0.0001***
	(0.00004	(0.00004)	(0.00004)	(0.00004)	(0.00002)	(0.00002)	(0.00002)
Punjab	**0.0397***	**0.0633***	**0.0454***	**-0.0828***	**-0.0339***	**-0.0096***	**-0.0221***
	(0.0079)	(0.0075)	(0.0073)	(0.0064)	(0.0039)	(0.0022)	(0.0023)
Sindh	**0.0795***	**0.0334***	**-0.0963***	**-0.0574***	**0.0299***	**0.0177***	**-0.0068****
	(0.0086)	(0.0082)	(0.0074)	(0.0078)	(0.0059)	(0.0039v	(0.0034)
Baloch	**0.0366***	**0.0603***	**-0.0541***	**-0.0079**	**-0.0198***	**0.0011**	**-0.0162***
	(0.0083)	(0.0081)	(0.0077)	(0.0080)	(0.0049)	(0.0033)	(0.0030)
Constant	**0.3209***	**0.2285***	**0.1936***	**0.1585***	**0.0576***	**0.0227***	**0.0183***
	(0.0026)	(0.0026)	(0.0024)	(0.0022)	(0.0014)	(0.0009)	(0.0008)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses. NAS=never attend school PMY= Primary school, MDL=Middle, MTC=Matric, INT= Intermediate, GRD= Graduate, PGR= Post Graduate, _F= father, _S= son.

Further, increase in income and wealth increase the probabilities of sons; though smaller in magnitudes, to attain higher level of education both in rural and urban regions. These increases in probabilities are larger in urban region than the rural for college and above levels of education indicating that sons of rich and wealthy family in urban regions are more likely to get high level of education as compared to the sons of rich and wealthy of the rural region. Results also indicate that with increase in family size the chances of a son increase to fall in "never attend school" or attain education up to middle level. However, the chances reduce to attain matric or above levels of education as family size increases in both urban and rural regions. Magnitudes of the marginal effects of variable age show that with the increase in age the sons are more likely to move to higher level of education in urban region than the rural one. This indicates that individuals in urban regions are more likely to complete different levels of education earlier than the individuals in rural regions. Further, province dummies show significant differences across the provinces showing that educational mobility across the provinces are different.

Finally, the impact of education of a mother is almost same on the probabilities of educational attainments of a son in both urban and rural region when mother is moving from "never attend school" to "below matric" level of education as depicted in tableB14 and B15 in Appendix-B. In both the regions, when mother is switching to "below matric" level of education, there is increase in probabilities of son to attain "primary", "middle", "matric" and "intermediate" levels of education and there is no significant impact on the probabilities of "graduate" and "post graduate" levels of education. However, the increases in probabilities of a son to fall in intermediate and above levels of education are larger in urban region than the increases in probabilities of the rural region when level of

education of a mother is switching from "never attend school" to "matric or above matric" level.

Results based on provincial level data depict more persistence at college and university levels of education in province Sindh followed by Khyber Pakhtunkhwa (KP) and Punjab, respectively[66]. With little manipulation, results show that overall mobility is higher in KP followed by Punjab and Sindh.

6.2.4 Summary of Educational Mobility

This section summarizes the educational status and its mobility across the generation in Pakistan. Majority of the sons and fathers are unable to attain high level of education in all the regions. Situation is even worse in the rural region as compared to the urban regions. However, in all the regions the proportions of sons are higher in high levels of education as compared to the fathers and average years of schooling of the sons are higher than the average years of schooling of fathers. Though this shows an improvement in the educational attainments of sons generation but still it is far behind the level of contemporary, especially developed, world.

Further, the data of co-resident son-father shows an upward mobility in educational status. On average educational levels of the sons are higher relative to their fathers. However, the chances are not equal for everyone to attain high levels of education. The sons of less educated fathers are less likely to attain high levels of

[66] Results are given in tables B9, B10, and B11 of appendix-B. Baluchistan is dropped from the comparative analysis because educational variable constructed for Baluchistan is different from other three provinces by merging education into four categories instead of seven due to smaller number of observations in higher levels of educations. For example data of father education shows that 76% of the fathers never attend school in Baluchistan and 91% were not able to reach matric level. Data of sons show that 74% were not able to reach matric level of education. Due to these reasons we divide education attainment data for Baluchistan in four categories; "never attend school", "below matric", "matric" and "above matric". Results presented in table B12 show persistence along with upward mobility in Baluchistan.

education as compared to those whose fathers are highly educated. A son is more likely to remain in low level of education if his father is also in low level of education. On the other hand, chances of sons are increasing to attain high levels of education with the increase in level of education of their fathers. These results suggest persistence in the educational status; the educational status of a son is like the educational status of his father. This persistence is highest at higher levels of education in urban regions and highest at lower levels of education in rural regions. Our results show upward mobility in educational attainments. However, in rural regions we observe downward mobility at high (college and university) levels of education.

Results also show that financial constraints hurt the educational attainments. The sons belonging to rich families are more likely to attain high level of education as compared to the sons who belonging to poor families. Further, a larger family size is observed to be hurdle in the attainments of high levels of education which confirms the resource dilute hypothesis. Investment per child decreases and fathers are unable to finance educational expenditure of their children when they are more in numbers. Finally, positive role of mother's education is observed by finding an increase in the probabilities of high levels of education of sons with the increase in level of education of mothers.

Finally, we have computed only absolute mobility and ignored the relative mobility; therefore, our mobility parameters might be upward biased. Upward mobility observed might be due to other external factors like change in government policies regarding education; change in general perception of the society regarding education etc. Since the beginning of 21st century, government of Pakistan not only increased scholarships, but reward to high level of education has also been increased. The numbers

of colleges and universities have increased considerably during this period. Not only interest of obtaining high level of education has increased but also overall demand for education at each level has increased which have shifted the overall distribution of education. Therefore, mobility observed might be due to these structural shifts in the education sector.

6.3 Occupational status of sons and fathers

In this section we investigate occupational status of fathers and sons by using descriptive statistics, summaries of mobility matrices and results of regression analysis. We carry out our analysis for overall Pakistan, urban regions, rural regions and all four provinces. Results based on descriptive statistics are presented in section 6.3.1. Summaries of transition matrices for different regions and conditional probabilities are discussed in section 6.3.2. Finally, results based on multinomial logit model are presented and discussed in section 6.3.3.

6.3.1 Descriptive statistics (Occupations)

In this section, we report the percentages of sons and fathers falling in different occupational categories. This will help us to understand the pattern and trend in the data of son and father generations and will give us some insights for further analysis on occupational mobility. Percentage distribution of fathers and sons in different occupational categories are given below in table 6.3.1.

Overall picture of occupations show that, in Pakistan as a whole and in provinces separately, individuals are more concentrated in lower status occupations. This is true for both, fathers' as well as sons' generations. For example in overall Pakistan, percentages of fathers and sons in top four high status occupations (CLK, TAP, PRF and MGR) are

Table 6.3.1: Percentage Distribution of Occupational Attainments

	Father					Son				
	Pak	KP	Punjab	Sindh	Baloch	Pak	KP	Punjab	Sindh	Baloch
Overall										
ELT	19.1	18.14	20.56	18.99	16.83	25.42	28.84	24.03	28.32	22.25
PMO	5.27	7.19	5.31	4.71	4.68	5.87	9.05	6.74	4.41	3.96
CRW	7.77	8.74	10.25	6.97	3.11	11.29	15.72	15.3	8.64	3.7
AFW	42.07	36.81	36.95	44.54	52.75	29.98	16.46	24.56	33.09	45.69
SSW	6.28	8.03	7.26	5.19	4.56	9.76	10.14	11.37	8.79	7.49
CLK	1.52	1.8	1.58	1.61	1.1	2.11	2.4	1.91	2.2	2.23
TAP	2.95	3.11	3.18	3.01	2.29	2.99	3.92	2.84	2.68	3.11
PRF	1.51	1.28	1.19	2.41	1.14	1.44	1.77	1.55	1.69	0.66
MGR	13.54	14.9	13.72	12.57	13.54	11.14	11.7	11.7	10.18	10.91
Urban										
ELT	20.92	18.29	22.23	21.13	16.43	20.79	17.44	19.44	24.37	19.97
PMO	8.34	10.73	8.32	7.52	8.47	6.94	9.27	8.09	5.3	3.79
CRW	14.65	13.9	16.51	15.29	4.17	19.9	26.71	21.54	18.87	7.84
AFW	8.55	9.63	7.43	7.73	15.55	4.58	3.29	3.94	4.19	10.24
SSW	11.04	12.2	11.73	9.74	10.37	16.46	14.15	17.65	15.13	17.07
CLK	3.24	3.41	2.73	3.78	3.92	3.93	4.02	3.29	4.36	5.69
TAP	5.06	3.54	5.08	5.92	3.92	4.41	3.66	3.89	4.69	6.95
PRF	2.45	1.95	1.92	3.45	2.53	2.5	1.46	2.53	2.88	2.28
MGRR	25.75	26.34	24.05	25.44	34.64	20.49	20	19.62	20.22	26.17
Rural										
ELT	18.25	18.09	19.53	17.76	16.9	27.57	32.75	26.87	30.6	22.67
PMO	3.84	5.97	3.45	3.09	3.97	5.37	8.98	5.9	3.89	4.00
CRW	4.58	6.98	6.38	2.16	2.91	7.3	11.95	11.44	2.73	2.93
AFW	57.63	46.12	55.17	65.81	59.72	41.76	20.97	37.29	49.79	52.32
SSW	4.07	6.6	4.5	2.56	3.48	6.65	8.77	7.49	5.13	5.70
CLK	0.72	1.25	0.87	0.36	0.57	1.27	1.84	1.06	0.95	1.58
TAP	1.97	2.97	2.00	1.33	1.99	2.33	4.01	2.19	1.52	2.39
PRF	1.07	1.04	0.73	1.8	0.87	0.95	1.88	0.95	1.00	0.35
MGR	7.87	10.99	7.37	5.13	9.6	6.81	8.86	6.81	4.39	8.06

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers

19.52% and 17.68% respectively, while in the four lowest status occupations (ELT, PMO, CRW and AFW) the percentages of fathers and sons are 74.21% and 72.56% respectively. Similarly, in all the four provinces the percentages of father as well as son are higher in the lower status occupations as compared to the higher status occupations. Further, data also show that percentages of fathers are greater in high status occupations than the percentages of sons. Moreover, data also reveals a transition of sons from agriculture and related occupations towards other occupations in both upward and downward directions.

Like overall Pakistan, percentages of both fathers and sons are larger in the lower status occupations in both urban and rural regions of overall Pakistan as well as of all four provinces. Further, in the urban regions the percentages of fathers are larger than the percentages of their sons in the high status occupations. For example, in overall urban regions the percentage distribution of fathers and sons, in the top three high status occupations are 33.26% and 27.4%, respectively. The same percentages are 31.83% and 25.12%, 31.05% and 26.04%, 34.81% and 27.79%, 41.09% and 35.4% in urban regions of KP, Punjab, Sindh and Balochistan, respectively. However, in rural regions the percentage distribution of fathers and sons in top three high status occupations are almost same. For example, overall rural regions show that percentages of father and son, in top three high status occupations are 10.09% and 10.91%, respectively.

In the high status occupations, the percentages of both fathers and sons are higher in urban regions than the rural regions. In rural regions, higher percentages of fathers and sons are engaged in lower status occupation i.e. agriculture and related. In both urban and rural regions the percentage of fathers in agriculture and related occupation is higher than

the percentage of sons[67]. It may be due to two reasons; first there is a decline in share of agriculture in general and in urban regions in particular over time. Second reason is migration from rural to urban regions. The fathers were living as farmers or agriculture labors in rural region but their sons are engaged in other occupations while living in urban regions where agriculture is less.

It is evident from the above discussion for overall Pakistan data, provinces and urban-rural regions that occupational status of both generations, fathers and sons, is concentrated more towards lower status occupations. Further, the percentages of sons are higher in lower status occupations than their fathers indicating that socio-economic status of sons' generation is decreasing. This gives some hints of the downward mobility in occupational status. However, this analysis does not provide the relative position of the sons' generation relative to the fathers. It only gives the overall absolute picture of the occupational status of current (sons) and past (fathers) generations. To assess relative positions of the status of sons, we present analysis based on transition matrices in the following section 6.3.2.

6.3.2 Transition Matrix (Occupational Mobility)

To find intergenerational occupational mobility, we use computations based on transition matrices in this section. It will give us some insights of the mobility of sons relative to their fathers. Again, like education, due to a large number of transition matrices required for this section (15 matrices), we do not report all information in order to save the space; rather their summary statistics are presented in table 6.3.2.

[67] Though percentages of sons in the agriculture and related occupation are smaller in all rural regions but their percentages in even lower status occupation (elementary occupation) are higher than their fathers'.

Table 6.3.2: Occupational Mobility-Summary of Transition Matrices

Region	Son -father		
	Downward Mobility	Immobility	Upward Mobility
Pakistan - overall	26.42	55.40	18.19
KP - overall	35.62	42.16	22.20
Punjab - overall	27.60	51.35	25.48
Sindh - overall	26.62	56.93	16.56
Balochistan - overall	17.94	70.15	11.98
Pakistan - Urban	27.37	48.69	24.01
KP - Urban	30.49	44.02	25.48
Punjab - Urban	25.94	48.64	25.4
Sindh - Urban	28.76	48.24	23.00
Balochistan - Urban	26.69	54.99	18.36
Pakistan - Rural	25.97	58.50	15.52
KP - Rural	37.39	41.53	21.1
Punjab - Rural	28. 6	53.04	18.39
Sindh Rural - Rural	25.26	61.94	12.75
Balochistan - Rural	16.23	72.97	10.73

Results shown in table 6.3.2 depict that there is strong persistence in occupational status in all the regions; that sons are like their fathers. Persistence is highest in Balochistan (70.15%) followed by Sindh (56.93%), Punjab (51.35%) and KP (42.16%). Results also show that persistence is strong in rural regions (58.5%) as compared to the urban (48.69%). Balochistan rural depicts the highest occupational persistence where 72.97% of the sons are engaged in the occupations of their fathers. Sindh rural comes next where the same percentage is 61.94%.

Occupational status of the sons' generation is falling as shown by the results where downward mobility is higher than the upward mobility in all the regions. Highest downward mobility is observed in KP (35.62%) followed by Punjab (27.6%), Sindh (26.62%) and Balochistan (17.94%). These results show that occupational status of the

current generation is falling and their opportunities of access to higher income earning are reducing relative to their fathers. Sons of the poor fathers remain poor while those born in the high status families are gaining the high status. If there is any movement, then this movement is more towards the lower status as compared to the higher status occupations. These findings are similar to Girdwood and Leibbrandt (2009), who report similar results for South Africa.

Although results presented in table 6.3.2 provide the overall picture of occupational status of sons in comparison to their fathers as well as the nature of persistence and mobility but does not report the likelihoods of a son to fall in particular occupations given the occupations of their fathers. What would be the occupational status of a son if occupation of his father is known? To answer this question we compute conditional probabilities of sons to fall in different occupations given the occupations of their fathers as presented in table 6.3.3.

We observe strong persistence in the occupational status as the probabilities given at diagonal are the largest for all the occupational categories except "clerk". This reflects that among all the occupations, the occupations of fathers are most likely to be chosen by the sons. This persistence is highest in the lower status occupations i.e. "elementary" and "skilled agricultural and fishery". For example the probability of a son to fall in "elementary" occupations is 62.34% given that his father is also in "elementary" occupations. Similarly, there is a chance of 62.55% that a son will fall in occupations related to "skilled agricultural and fishery" if his father is also in the same occupations. At the other extreme, the chance of a son to fall in the highest status occupation (MGR) is 55.05% if his father is also in this highest status occupation. Discouraging results that can

Table 6.3.3: Occupational Mobility - Conditional Probabilities

	Occupation of Son								
	ELT	PMO	CRW	AFW	SSW	CLK	TAP	PRF	MGR
Overall									
ELT_F	62.34*	5.56*	10.91*	7.03*	8.55*	1.06*	1.33*	0.44*	2.78*
PMO_F	23.55*	27.92*	15.2*	8.05*	11.5*	4.14*	2.78*	0.98*	5.87*
CRW_F	16.06*	4.08*	54.28*	3.26*	11.67*	1.99*	2.4*	0.92*	5.35*
AFW_F	17.9*	4.01*	4.33*	62.55*	3.89*	0.96*	1.97*	0.79*	3.6*
SSW_F	17.74*	7.01*	12.63*	6.31*	45.39*	3.6*	2.78*	1.52*	3.03*
CLK_F	16.15*	4.95*	13.28*	7.81*	18.75*	12.5*	8.33*	5.99*	12.24*
TAP_F	16.94*	5.78*	10.89*	9.27*	12.37*	5.91*	23.79*	3.9*	11.16*
PRF_F	11.81*	3.94*	8.66*	14.44*	11.02*	8.14*	8.66*	18.9*	14.44*
MGR_F	10.77*	4.33*	6.79*	4.68*	9.72*	3.1*	3.25*	2.31*	55.05*
Urban									
ELT_F	52.54*	7.41*	18.59*	0.84*	13.15*	1.61*	1.97*	0.6*	3.29*
PMO_F	21.59*	28.04*	19.79*	1.5*	13.19*	4.65*	2.4*	1.5*	7.35*
CRW_F	11.35*	4.61*	57.85*	0.94*	13.05*	2.56*	2.82*	1.02*	5.8*
AFW_F	15.64*	3.95*	10.67*	42.4*	9.36*	2.34*	3.36*	2.19*	10.09*
SSW_F	16.76*	6.8*	14.95*	0.68*	48.13*	4.87*	2.38*	1.81*	3.62*
CLK_F	13.51*	4.63*	13.51*	1.16***	18.53*	16.2*	10.42*	7.72*	14.29*
TAP_F	13.09*	5.19*	13.83*	1.48*	16.05*	7.65*	25.68*	3.46*	13.58*
PRF_F	7.14*	4.59*	12.24*	2.55**	15.82*	10.2*	10.2*	22.45*	14.8*
MGR_F	7.28*	2.96*	7.33*	1.02*	10.83*	3.59*	3.69*	2.86*	60.44*
Rural									
ELT_F	67.56*	4.58*	6.83*	10.33*	6.1*	0.76*	0.99*	0.35*	2.51*
PMO_F	25.53*	27.79*	10.57*	14.65*	9.82*	3.63*	3.17*	0.45***	4.38*
CRW_F	23.04*	3.29*	48.99*	6.71*	9.62*	1.14*	1.77*	0.76*	4.68*
AFW_F	18.06*	4.02*	3.89*	63.94*	3.51*	0.87*	1.87*	0.69*	3.15*
SSW_F	18.97*	7.28*	9.7*	13.41*	41.94*	2.00*	3.28*	1.14*	2.28*
CLK_F	21.60*	5.6*	12.8*	21.6*	19.2*	4.8*	4.00*	2.4***	8.00*
TAP_F	21.53*	6.49*	7.37*	18.58*	7.96*	3.83*	21.53*	4.42*	8.26*
PRF_F	16.76*	3.24*	4.86*	27.03*	5.95*	5.95*	7.03*	15.14*	14.05*
MGR_F	16.06*	6.41*	5.97*	10.24*	8.03*	2.36*	2.58*	1.47*	46.87*

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers, _F= father, _S=Son.

be observed are that the chances of the sons to move to higher status occupations (TAP, PRF and MGR) are smaller, given that their fathers are in lower status occupations, as compared to those whose fathers are in high status occupations. It implies that opportunities are not equal for rich and poor individuals to move to high status occupations. Even most discouraging of the findings show that whatever the occupation

Resembling the findings of Motiram and Singh (2012) for India, we observe not only strong persistence but also a downward mobility in occupational status in Pakistan. (high or low status) of a father may be, the chances for a son to move towards the lower status occupations are higher than his chances to move towards higher status occupations.

Most of the sons either adopt the occupations of their fathers or fall in lower status occupations relative to their fathers. However, our results contradict with the findings of Long and Ferrie (2013) for US and Britain, where they find more mobility, especially towards white collar occupations, for the data of 20th century. However, their results based on the data of 19th century not only exhibit strong persistence in occupational status in both US and Britain but also observe downward mobility in the higher status occupations. In simple words, the 21st data for Pakistan reveal a picture similar to 19th century situation that prevail in US and Britain. Our results deviate from those of Fachelli, and Planas (2014) who find more persistence in the high status occupations and more upward mobility in the lower status occupations. Findings by Javed and Irfan (2015) reveal a larger probability for the sons whose fathers are in high status occupations to fall in lower status occupations in Pakistan. However, their results are suffering from a serious issue i.e. the observations in the high status occupations are very limited in their data.

Like overall Pakistan, results of both urban and rural regions reveal strong persistence in the occupational status. The diagonal probabilities are largest except for "clerk" in urban region and "clerks" and "professionals" in rural region. In rural regions the sons of "clerk" and "professionals" are more likely to fall in "skilled agricultural and fishery workers" and "elementary" occupations. While persistence is strongest at the highest status occupations in urban regions, it is strongest at the lowest status occupation in rural regions[68]. Similar results are found by Motiram and Singh (2012) for India. However, they combine "clerks", "service workers", "skilled agriculture and fisheries workers and related", into one category. They also find relatively strong persistence in the higher status occupations in urban India. The overall picture that emerges from our results of the urban and rural data depicts that there is not only a strong persistence in occupational status but also downward mobility is higher than the upward mobility in both the regions. Moreover, it can also be observed from the first columns of the urban and rural data that chances of sons to move towards the lowest status occupations (elementary) are greater in rural regions than the urban regions.

Province level data also depicts a strong persistence in the occupational status[69]. Strongest persistence in the lower status can be observed in Balochistan followed by Sindh, KP and Punjab. At the highest status, the strongest persistence is observed in the Balochistan followed by Sindh, Punjab and KP. The probabilities shown in columns for all four provinces and their rural and urban regions reveal that chances for sons to fall in "elementary" occupations are greater as compared to other occupations. Moreover, the

[68] In urban regions probability of a son to fall in highest status occupation (Managers) is 60.44% given that his father is also in highest status occupation while the same probability is 46.87% in rural regions. In rural regions, the probability of a son to fall in lowest status "elementary" occupation is 67.56% given that his father is also in "elementary" occupation and the same probability is 52.54% in urban regions.

[69] Results are given in tables C1, C2, C3 and C4 in appendix-C

values to the left and down of diagonal probabilities are greater than the values to the right and above of diagonal probabilities. This suggests a downward mobility in the occupational status along with strong persistence in all four provinces as a whole and as well as in their urban and rural regions. Moreover, while persistence is the strongest at the lowest status in rural regions it is strongest at the highest status in the urban regions of all provinces.

Our results deviate from the findings of Javed and Irfan (2015) as they find more downward mobility while we find relatively more persistence in the highest status occupation. Our results are consistent with Motiram and Singh (2012) who find similar results for India but relatively less persistence. Results of Beller and Hout (2006) show relatively less persistence and more mobility in US. Our results contradict the findings of Girdwood and Leibbrandt (2009) for South Africa as they find relatively more upward mobility in elementary occupations and downward mobility in skill level-3 and skill level-4 occupations into skill level-2 occupation.

6.3.3 Occupational Mobility Based on Regression Analysis

To analyze the impact of other socio-economic variables along with occupational status of father on occupational status of a son, we present results based on categorical logit estimation method in this section. Results of Ordered Logit Model (OLM) given in table C5 in Appendix-Cshow that occupational status of a son strongly depends on the occupational status of his father. However, Brant test given in the same table rejects the assumption of parallel regression (proportional odd ratio). Therefore, we present estimates of multinomial logit model in table 6.3.5 after discussing the statistical validity and reliability of using multinomial logit model in Table 6.3.4.

Before estimating marginal effects, first we test the statistical validity of MNLM as given in table 6.3.4. First we test the assumption of "Independence of Irrelevant Alternatives" (IIA) by using ***Hausman test.*** Results are reported at the top panel of the table. In all nine cases, we do not reject the null hypothesis which means that assumption

Table 6.3.4: Testing Validity of Multinomial Logit Model -Occupation

The Hausman test of IIA							
Ho: Odds(Outcome-J vs. Outcome-K) are independent of other alternatives							
	χ^2	**d.f.**	**P>χ2**		χ^2	**d.f.**	**P>χ2**
ELT_S	167.383	147	0.12	CLK_S	10.387	144	1.00
PMO_ S	-103.646	147	.	TAP_ S	0.913	145	1.00
CRW_ S	-75.057	145	.	PRF_ S	17.615	146	1.00
AFW_ S	11.357	147	1.00	MGR_ S	-129.188	147	.
SSW_ S	109.932	146	0.989				
Wald test							
Ho: All coefficients associated with given variable(s) are 0							
	χ^2	**d.f.**	**P>χ2**		χ^2	**d.f.**	**P>χ^2**
PMO_F	501.751	8	0.00	PMY_S	96.041	8	0.00
CRW_F	936.977	8	0.00	MDL_S	128.7	8	0.00
AFW_F	2384.287	8	0.00	MTC_S	325.131	8	0.00
SSW_F	793.846	8	0.00	INT_S	491.629	8	0.00
CLK_F	91.634	8	0.00	GRD_S	582.672	8	0.00
TAP_F	282.883	8	0.00	PGR_S	581.065	8	0.00
PRF_F	84.331	8	0.00	Age	271.114	8	0.00
MGR_F	1264.111	8	0.00	Rural	515.002	8	0.00
Income	456.039	8	0.00	Punjab	133.137	8	0.00
Wealth	384.761	8	0.00	Sindh	283.745	8	0.00
				Baloch	511.709	8	0.00
	LR χ2 (168)	=	27836.77		**Pseudo R^2**	=	0.2995
	P >χ2	=	0.00		**N**	=	25241

of IIA is not violated. ***Wald test***, given in the second panel of the table 6.3.4, tests the hypothesis that coefficients associated with given variable(s) are simultaneously equal to zero for all the outcome categories. Results of all 21 Wald tests show that we can reject the null hypothesis and thus conclude that all independent variables have statistically significant effect on all occupational categories of sons simultaneously. So there is no "irrelevant variable" in our model. Finally, ***LR test*** given at the lower panel of the table, tests the overall significance of the model. The value of Likelihood Ratio (LR) statistics 27836.77with p-value of 0.00 tells that overall model fits significantly better than a model with no explanatory variable. After confirming that MNLM is good fit for our data, we present marginal effects, computed from the log odds[70], in table 6.3.5.

Results reveal strong persistence in the occupational status. The increase in probabilities of a son to fall in the occupation of his fathers (when father is moving from "elementary" to any other occupation), are largest except for "clerk" and "professionals". For example, when father switches from "elementary" to "Plant and Machine Operators and Assemblers", the increase in probability of a son to fall in the same occupation is 19.89 percentage points. Similarly, when father is moving from "elementary" to "Craft and Related Trades Workers" the increase in probability of a son to fall in the same occupation is 32.18 percentage points. Increases in probabilities of a son to fall in "Skilled Agricultural and Fishery Workers", "Service Workers and Shop and Market Sales Workers" ,"Technicians and Associate Professionals" and "Managers" are 43.52, 30.48, 11.69 and 39.90 percentage points when father is moving from elementary occupation to "Skilled Agricultural and Fishery Workers", "Service Workers and Shop

[70] Log odds are given in table C6, Appendix-C.

Table 6.3.5: Occupational Mobility (Marginal Effects)-Overall Pakistan

	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	-0.2629*	0.1989*	0.0024	0.0286*	0.0016	0.0166*	0.0018	0.0019	0.0109
	(0.0139)	(0.0124)	(0.0094)	(0.0105)	(0.0090)	(0.0057)	(0.0055)	(0.0046)	(0.0070)
CRW_F	-0.3062*	-0.0194*	0.3218*	-0.0236*	0.015***	-0.0001	0.0027	-0.0010	0.0112**
	(0.0123)	(0.0059)	(0.0121)	(0.0081)	(0.0086)	(0.0045)	(0.0052)	(0.0038)	(0.0063)
AFW_F	-0.3476*	-0.0120*	-0.0465*	0.4352*	-0.0380*	-0.0053	0.0028	-0.0017	0.0130*
	(0.0082)	(0.0046)	(0.0060)	(0.0068)	(0.0056)	(0.0035)	(0.0038)	(0.0030)	(0.0047)
SSW_F	-0.3091*	0.0062	-0.017**	0.0183**	0.3048*	0.009***	-0.0003	0.0029	-0.0149*
	(0.0129)	(0.0073)	(0.0085)	(0.0100)	(0.0132)	(0.0049)	(0.0050)	(0.0040)	(0.0055)
CLK_F	-0.2249*	-0.0054	-0.0008	0.0762*	0.0567*	0.0247*	0.015***	0.0134	0.0454*
	(0.0294)	(0.0131)	(0.0164)	(0.0249)	(0.0183)	(0.0075)	(0.0081)	(0.0059)	(0.0131)
TAP_F	-0.2487*	0.0031	-0.0133	0.0666*	0.0195	0.0078	0.1169*	0.004*	0.0441*
	(0.0204)	(0.0103)	(0.0121)	(0.0163)	(0.0127)	(0.0055)	(0.0110)	(0.0043)	(0.0101)
PRF_F	-0.2262*	0.0023	-0.0061	0.1418*	0.0124	0.0032	0.0055	0.0206*	0.0464*
	(0.0344)	(0.0164)	(0.0192)	(0.0264)	(0.0176)	(0.0057)	(0.0067)	(0.0051)	(0.0131)
MGR_F	-0.3331*	-0.0088	-0.0517*	-0.0002	0.0014	-0.0029	-0.0029	-0.0008	0.3990*
	(0.0112)	(0.0058)	(0.0067)	(0.0075)	(0.0074)	(0.0037)	(0.0041)	(0.0031)	(0.0102)
Income	-0.0333*	-0.0017***	0.0026*	0.0250*	-0.0016	-0.0005	0.0003	0.0010*	0.0082*
	(0.0023)	(0.0010)	(0.0011)	(0.0012)	(0.0012)	(0.0004)	(0.0004)	(0.0001)	(0.0005)
Wealth	-0.0042*	0.0010*	0.0018*	-0.0008*	0.0003	0.0002*	0.0003*	0.0001	0.0015*
	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
PMY_S	-0.0394*	0.0058	0.0312*	-0.0298*	0.011**	0.0008	0.0027	0.0007	0.0167*
	(0.0071)	(0.0049)	(0.0060)	(0.0062)	(0.0052)	(0.0008)	(0.0020)	(0.0009)	(0.0054)
MDL_S	-0.0403*	0.0045	0.0245*	-0.0399*	0.0148*	0.0072*	0.004***	0.0008	0.0247*
	(0.0078)	(0.0050)	(0.0059)	(0.0070)	(0.0054)	(0.0014)	(0.0021)	(0.0009)	(0.0055)
MTC_S	-0.0625*	-0.0181*	0.0027	-0.0547*	0.0425*	0.0235*	0.0298*	0.0053*	0.0315*
	(0.0086)	(0.0050)	(0.0063)	(0.0076)	(0.0062)	(0.0023)	(0.0031)	(0.0013)	(0.0058)
INT_S	-0.1014*	-0.0308*	-0.0325*	-0.0823*	0.0681*	0.0603*	0.0649*	0.0190*	0.0348*
	(0.0118)	(0.0059)	(0.0075)	(0.0108)	(0.0094)	(0.0058)	(0.0063)	(0.0033)	(0.0075)
GRD_S	-0.1826*	-0.0414*	-0.0568*	-0.1254*	0.0482*	0.1404*	0.1332*	0.0655*	0.0190**
	(0.0164)	(0.0070)	(0.0091)	(0.0168)	(0.0132)	(0.0139)	(0.0132)	(0.0093)	(0.0098)
PGR_S	-0.2072*	-0.0622*	-0.0769*	-0.1872*	0.0010	0.1380*	0.1509*	0.2315*	0.0119
	(0.0204)	(0.0050)	(0.0090)	(0.0221)	(0.0135)	(0.0175)	(0.0180)	(0.0250)	(0.0109)
Age	0.0002	0.0026*	-0.0007*	-0.0043*	-0.0003	0.0002	0.0009*	0.0005*	0.0007*
	(0.0078)	(0.0041)	(0.0054)	(0.0076)	(0.0053)	(0.0024)	(0.0028)	(0.0019)	(0.0047)
Rural	-0.0379*	-0.0023	-0.052**	0.1597*	-0.0461*	-0.0031	0.0017	0.0036**	-0.0233*
	(0.0078)	(0.0041)	(0.0054)	(0.0076)	(0.0053)	(0.0024)	(0.0028)	(0.0019)	(0.0047)
Punjab	-0.0397*	-0.0191*	-0.0253*	0.0785*	0.013**	-0.0004	-0.0042	0.0028	-0.0056
	(0.0083)	(0.0050)	(0.0063)	(0.0074)	(0.0054)	(0.0025)	(0.0031)	(0.0020)	(0.0051)
Sindh	-0.0225*	-0.0285*	-0.0559*	0.1193*	-0.0012	-0.0011	-0.007**	-0.0002	-0.0028
	(0.0088)	(0.0053)	(0.0067)	(0.0078)	(0.0058)	(0.0026)	(0.0032)	(0.0020)	(0.0056)
Baloch	-0.0863*	-0.0310*	-0.0862*	0.1468*	0.0091	0.0172*	0.0145*	-0.0026	0.0185*
	(0.0090)	(0.0056)	(0.0070)	(0.0081)	(0.0066)	(0.0039)	(0.0043)	(0.0024)	(0.0062)
Constant	0.2542*	0.0587*	0.1129*	0.2998*	0.0976*	0.0211*	0.0299	0.0144*	0.1114*
	(0.0024)	(0.0014)	(0.0018)	(0.0022)	(0.0017)	(0.0009)	(0.0010)	(0.0007)	(0.0016)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses, _F= father, _S= son

and Market Sales Workers", "Technicians and Associate Professionals" and "Managers", respectively. However, the increase in probabilities of a son to move to "clerk" and "professionals" are only 2.47 and 2.06 percentage points when father occupation switches from "elementary" to "clerk" and "professionals", respectively. The sons of "clerks" and "professionals" are more likely to fall in "Skilled Agricultural and Fishery Workers"[71].

Apart from the strong persistence in most of the occupations, we also observe the following points in the occupational status relationship between sons' and fathers' generations.

(1) Changes in probabilities of a son to remain in "elementary" occupation are not only negative but also larger in magnitudes when father is moving to any of the higher status occupation as evident from the first column labeled as "ELT_S" of table 6.3.5.

(2) The sons of "clerks" and "professionals" are the most mobile. They move in either direction i.e. towards higher or lower status occupations. However, on average, their mobility towards lower status occupation is higher than the mobility towards higher status occupations.

(3) Overall results of table 6.3.5 and table C9[72] given in Appendix-C, reveal downward mobility along with strong persistence in most of the occupations. The son generation either achieves the same occupational status as the father generation did or on average they fall behind the status of their fathers.

[71] Increase in probabilities of a son to fall in "Skilled Agricultural and Fishery Workers" are 7.64 and 14.18 percentage points when father is in "clerk" and "professional" respectively.

[72] In table C9 of Appendix-C, occupations are merged into four categories on the basis of skill level required for each occupation.

These findings contradict with Girdwood and Leibbrandt (2009) who find upward mobility in occupational status for South Africa. Similarly, our results also contradict with Nguyen and Getinet (2003) who find upward mobility in occupational status of the sons relative to their fathers in US. The reasons might be that individuals in these countries are more educated and their financial backgrounds are stronger. Further, their economies are stronger than Pakistan, therfore, availability f jobs in the high status occupations are higher in these countries.

Family background variables, "income" and "wealth", have positive impacts on the probabilities of high status occupations ("Technicians and Associate Professionals", "Professionals" and "Managers") and their impacts on the probabilities of lower status occupations are mixed. However, when we merge occupations into four categories, on the basis of skill level required in occupations (results are given in table C9, appendix-C), the probability to choose lowest status "elementary" occupation decreases and the probabilities to choose higher status occupations increase with the increase in "income" and "wealth" of the fathers.

Human capital variable, level of education of a son, has positive impact on the probabilities of high status occupations. With the increase in level of education of a son, the probabilities to achieve high status occupations increase. Further, results also show that when level of education of a son increases, the decrease in probability to fall in "elementary" occupation increases as evident from the values of marginal effects in the column labeled as "ELT_S" in table 6.3.5[73]. It means that with the increase in level of education, the chance of an individual to fall in "elementary occupation" is decreasing.

[73]When father moves from "elementary occupation" to "Plant and Machine Operators and Assemblers" the change in probability of a son to remain in "elementary occupation" is -0.2629 and the same change in probability reaches to -0.3331 to remain in "elementary occupation when father switches to "Manager".

The increase in probability to choose "Clerk" as an occupation is highest (14.04percentage points) when a son is holding "graduate" degree. Both "Technicians and Associate Professionals" and "Professionals" are the occupations which require highly educated individuals. Our results also confirm that the increases in probabilities of choosing "Technicians and Associate Professionals" (15.09percentage points) and "Professionals" (23.15 percentage points) are the largest for individuals who attain maximum level of education i.e. "post graduate".

The changes in probabilities of the highest status occupation "Managers" are positive[74] for each level of education but insignificant in case of "post graduate". Apart from highly qualified occupations like Senior Government Officials, Senior Officials of Special-Interest Organizations, Directors and Chief Executives, this category also includes occupations like "Traditional Chiefs and Heads of Villages", "General Managers" and "Legislators" which do not require high level of education. Especially "General Managers" (which include owner of the shops, businesses, schools, colleges, factories etc.) are usually less educated. Therefore, the reason that impact of "post graduate" is insignificant may be that our data contains 96.7 percent of the observations on "General Managers" in the top status category "Managers".

Age is another human capital variable[75] representing work experience. In job market, as age increases the chance of a son to move to high status occupations increases due to getting more experience of the job market. Results show that, changes in choice

[74] The magnitudes of increase in probabilities are relatively smaller. The maximum increase in the probability of choosing "Managers" is 3.48 percentage points for individuals with "intermediate" level of education.

[75] We also run regression by adding age square as an explanatory variable along with the age but is not significant.

probabilities of lower status occupations are negative or insignificant[76], except for "Plant and Machine Operators and Assemblers" with the increase in age of a son. The change in choice probability of "Plant and Machine Operators and Assemblers" is positive if there is increase in age. The reason might be that this category includes 77percent of the observations on "Drivers and Plant Operators", which requires relatively more experience. The impact of age on the choice probability of high status occupations is found to be positive. Combining the results of table 6.3.5 and table C9 given in Appendix-C, we can observe that age is insignificant or has negative impact on the choice probabilities of lower status occupations (skill1 and skill2), and has positive impact on the choice probabilities of high skill occupations (skill3 and skill4). Thus the older sons have more chance to be in better occupations. This result is consistent with the findings of Girdwood and Leibbrandt (2009).

Labor market opportunities are not same in the rural and urban regions; therefore, we can observe different impact of regional dummy on different occupations. For example, the choice probabilities of all low status occupations, except agriculture and fishery, decrease for individuals who belong to rural region. These includes occupations like labors in construction, manufacturing and transport, street vendors, shoe cleaners, porters, doorkeepers, garbage collectors, helpers, launders, building caretakers, craft and related trade workers, service workers, shop and market sale workers, models and demonstrators[77] etc. Probability to fall in these occupations decreases when individual belongs to rural regions. However, in case of occupation "Skilled Agricultural and Fishery Workers", probability increases if individual belongs to rural region. The

[76] It is insignificant in case of "elementary", "Service Workers and Shop and Market Sales Workers" and "Clerk".
[77] Impact is insignificant in case of "Plant and Machine Operators and Assemblers" and "Clerk"

probability to choose the highest status occupation "Managers" decreases while that of "Professionals" increases for rural individuals. Magnitude (-2.33 percentage points) of decrease in probability of occupation "Managers" is larger than the magnitude (0.36percentage points) of increase in probability of occupation "Professionals". Therefore, the overall probability for a rural individual decreases to fall in high status occupations[78] (skill4) as can be seen in table C9, Appendix-C.

To explore and compare the strength of intergenerational mobility in occupational status across the urban and rural regions we run separate regression on urban and rural data[79] and present the results in following table 6.3.7 and table 6.3.7.

Results of table 6.3.6 and table 6.3.7 show strong persistence in the occupational status in both urban and rural regions. In both regions, increases in probabilities of sons to fall in the fathers' occupations are the largest, except for "Clerk" and "Professionals", when fathers switch from "elementary" to any other higher status occupation. In urban region, the probabilities to fall in high status occupations ("Technicians and Associate Professionals", "Professionals" and "Managers") increase for sons of the clerks[80]. On the other hand, in rural region the probabilities of sons of "clerks" are found to increase more in the lower status occupations ("Skilled Agricultural and Fishery Workers" and "Service Workers and Shop and Market Sales Workers"). For the sons of "Professionals", in urban region, increase in probability is largest (6.03 percentage points) to fall in "Service Workers and Shop and Market Sales Workers" and in case of rural region it is largest (17.66 percentage points) to fall in "Skilled Agricultural and Fishery Workers".

[78] The change in probability of "Technicians and Associate Professionals" is positive but insignificant.
[79] Odd ratios are given in tables C7 and C8 in Appendix-C.
[80] Increase in probability is the largest (8.2percentage points) in the highest status occupation "Managers". We can also observe an increase of 5.46 percentage points in probability in the lower status occupation i.e. "Service Workers and Shop and Market Sales Workers" for the sons of "clerks"

Table 6.3.6: Occupational Mobility (Marginal Effects) -Urban

	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	-0.2198*	0.1995*	-0.0130	0.0064	-0.0235	0.0248**	-0.0121	0.0110	0.027
	(0.0190)	(0.0176)	(0.0174)	(0.0053)	(0.0157)	(0.0108)	(0.0100)	(0.0100)	(0.0131)
CRW_F	-0.3104*	-0.0279*	0.3429*	0.0018	-0.0170	0.0041	-0.0018	-0.0016	0.0100
	(0.0152)	(0.0086)	(0.0173)	(0.0039)	(0.0138)	(0.0085)	(0.0096)	(0.0076)	(0.0104)
AFW_F	-0.282*	-0.0326*	-0.0750*	0.3929*	-0.0495*	-0.0084	-0.0050	0.0025	0.057
	(0.0178)	(0.0097)	(0.0164)	(0.0198)	(0.0152)	(0.0082)	(0.0102)	(0.0080)	(0.0145)
SSW_F	-0.2657*	-0.0079	-0.0520*	-0.0016	0.3231*	0.0258*	-0.0134	0.0072	-0.015*
	(0.0167)	(0.0101)	(0.0152)	(0.0037)	(0.0190)	(0.0098)	(0.0092)	(0.0082)	(0.0100)
CLK_F	-0.2191*	-0.0078	-0.0190	0.0064	0.0546**	0.0514*	0.024***	0.0278*	0.082*
	(0.0315)	(0.0188)	(0.0283)	(0.0090)	(0.0283)	(0.0139)	(0.0146)	(0.0111)	(0.0222)
TAP_F	-0.2478*	-0.0114	-0.0270	0.0099	0.0311	0.0219**	0.1529*	0.0005	0.0699*
	(0.0244)	(0.0143)	(0.0225)	(0.0079)	(0.0226)	(0.0112)	(0.0191)	(0.0080)	(0.0176)
PRF_F	-0.2547*	0.0220	0.0185	0.031***	0.0603***	0.0196	0.009	0.0369*	0.057*
	(0.0412)	(0.0303)	(0.0396)	(0.0176)	(0.0365)	(0.0132)	(0.0141)	(0.0108)	(0.0228)
MGR_F	-0.3186*	-0.0327*	-0.1055*	0.0035	-0.024***	-0.0014	-0.012	-0.0016	0.4928*
	(0.0151)	(0.0084)	(0.0127)	(0.0036)	(0.0130)	(0.0071)	(0.0081)	(0.0065)	(0.0142)
Income	-0.0081*	0.0002	0.0031	0.0022*	-0.0024	-0.0030*	-0.0002	0.0011*	0.0071*
	(0.0028)	(0.0015)	(0.0020)	(0.0003)	(0.0022)	(0.0010)	(0.0008)	(0.0002)	(0.0011)
Wealth	-0.0045*	-0.0001	0.0015*	-0.0002	-0.0003	-0.0002	0.0006**	0.0001	0.0033*
	(0.0005)	(0.0004)	(0.0005)	(0.0002)	(0.0005)	(0.0003)	(0.0003)	(0.0002)	(0.0005)
PMY_S	-0.0567*	0.0035	0.0295*	-0.0275*	0.0241***	0.0016	0.0042	-0.0032	0.025**
	(0.0144)	(0.0116)	(0.0150)	(0.0074)	(0.0132)	(0.0021)	(0.0059)	(0.0025)	(0.0148)
MDL_S	-0.0609*	-0.020**	0.0372*	-0.0217*	0.0363*	0.0075*	0.0028	-0.0018	0.021
	(0.0145)	(0.0108)	(0.0146)	(0.0075)	(0.0129)	(0.0026)	(0.0054)	(0.0026)	(0.0139)
MTC_S	-0.0829*	-0.0454*	-0.0068	-0.0285*	0.0678*	0.0306*	0.0222*	0.006**	0.0373*
	(0.0152)	(0.0108)	(0.0151)	(0.0075)	(0.0141)	(0.0045)	(0.0063)	(0.0034)	(0.0143)
INT_S	-0.1193*	-0.0590*	-0.0612*	-0.0355*	0.0756*	0.0825*	0.0586*	0.0187*	0.0396*
	(0.0184)	(0.0119)	(0.0174)	(0.0087)	(0.0182)	(0.0102)	(0.0097)	(0.0055)	(0.0165)
GRD_S	-0.2037*	-0.0717*	-0.1280*	-0.0332*	0.0447**	0.2163*	0.1158*	0.0502*	0.0096
	(0.0204)	(0.0131)	(0.0192)	(0.0110)	(0.0235)	(0.0232)	(0.0168)	(0.0107)	(0.0195)
PGR_S	-0.1993*	-0.0920*	-0.1480*	-0.0536*	-0.0174	0.2021*	0.1239*	0.2053*	-0.0210
	(0.0240)	(0.0109)	(0.0197)	(0.0094)	(0.0233)	(0.0274)	(0.0205)	(0.0277)	(0.0200)
Age	-0.0005	0.0029*	-0.0024*	-0.0006*	-0.0018**	0.0003	0.0003	0.0004	0.0014*
	(0.0008)	(0.0005)	(0.0008)	(0.0003)	(0.0008)	(0.0004)	(0.0004)	(0.0003)	(0.0007)
Punjab	0.022***	-0.0068	-0.0699*	0.0108***	0.0375*	-0.0004	-0.0005	0.0144*	-0.0070
	(0.0131)	(0.0098)	(0.0150)	(0.0060)	(0.0128)	(0.0072)	(0.0076)	(0.0048)	(0.0124)
Sindh	0.0719	-0.0253*	-0.0715*	0.0121*	0.0159	-0.0056	-0.0024	0.008***	-0.0031
	(0.0142)	(0.0102)	(0.0158)	(0.0064)	(0.0134)	(0.0071)	(0.0077)	(0.0046)	(0.0129)
Baloch	0.036**	-0.0428*	-0.1495*	0.0264*	0.040**	0.019***	0.0376*	0.0102*	0.0232
	(0.0174)	(0.0115)	(0.0186)	(0.0077)	(0.0175)	(0.0102)	(0.0118)	(0.0066)	(0.0160)
Constant	0.2079	0.0694*	0.1990*	0.0458*	0.1646*	0.0393*	0.0441*	0.0250	0.2049*
	(0.0040)	(0.0027)	(0.0040)	(0.0019)	(0.0039)	(0.0020)	(0.0021)	(0.0016)	(0.0036)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses, _F= father, _S= son.

Table 6.3.7: Occupational Mobility (Marginal Effects)-Rural

	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	-0.2971*	0.1953*	0.0117	0.0455*	0.021***	0.0144**	0.0111	-0.0047	0.0030
	(0.0193)	(0.0168)	(0.0117)	(0.0162)	(0.0121)	(0.0069)	(0.0072)	(0.0046)	(0.0083)
CRW_F	-0.2984*	-0.0219*	0.3179*	-0.0394*	0.0305*	-0.0030	0.0024	-0.0013	0.0132
	(0.0183)	(0.0076)	(0.0172)	(0.0128)	(0.0122)	(0.0057)	(0.0065)	(0.0047)	(0.0089)
AFW_F	-0.3977*	-0.0116**	-0.0367*	0.4951*	-0.0344*	-0.008**	0.0003	-0.0043	-0.0031
	(0.0095)	(0.0049)	(0.0057)	(0.0079)	(0.0055)	(0.0036)	(0.0037)	(0.0030)	(0.0045)
SSW_F	-0.3572*	0.0124	0.0022	0.0369*	0.3177*	-0.0023	0.0063	-0.0002	-0.016**
	(0.0184)	(0.0101)	(0.0109)	(0.0160)	(0.0191)	(0.0052)	(0.0062)	(0.0046)	(0.0066)
CLK_F	-0.2437*	-0.0056	0.0131	0.1341*	0.0814*	0.0026	-0.0003	0.0007	0.0177
	(0.0473)	(0.0184)	(0.0229)	(0.0416)	(0.0302)	(0.0087)	(0.0092)	(0.0070)	(0.0174)
TAP_F	-0.2425*	0.0140	-0.0092	0.0932*	0.0081	0.0005	0.0972*	0.0078	0.0309**
	(0.0300)	(0.0148)	(0.0146)	(0.0248)	(0.0159)	(0.0061)	(0.0139)	(0.0058)	(0.0132)
PRF_F	-0.1924*	-0.0118	-0.0211	0.1766*	-0.0211	-0.0038	0.0026	0.0132**	0.0579*
	(0.0480)	(0.0175)	(0.0198)	(0.0387)	(0.0164)	(0.0055)	(0.0073)	(0.0059)	(0.0194)
MGR_F	-0.3445*	0.0097	-0.0226*	-0.0058	0.0102	-0.0022	-0.0003	-0.0023	0.3578*
	(0.0157)	(0.0082)	(0.0083)	(0.0115)	(0.0094)	(0.0044)	(0.0047)	(0.0036)	(0.0142)
Income	-0.0520*	-0.0060**	0.0010	0.0472*	0.0031**	0.0006**	0.0003	0.0010*	0.0048*
	(0.0031)	(0.0013)	(0.0012)	(0.0021)	(0.0014)	(0.0003)	(0.0005)	(0.0001)	(0.0007)
Wealth	-0.0040*	0.0014*	0.0017*	-0.0014	0.0007*	0.0004*	0.0002**	0.0004*	0.0012*
	(0.0003)	(0.0002)	(0.0002)	(0.0013)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)
PMY_S	-0.0310*	0.0068	0.0309*	-0.0332*	0.0076	0.0005	0.0019	0.0017**	0.0147*
	(0.0082)	(0.0051)	(0.0055)	(0.0084)	(0.0049)	(0.0008)	(0.0019)	(0.0009)	(0.0048)
MDL_S	-0.0311*	0.0152*	0.0186*	-0.0487*	0.0059	0.0070*	0.0031	0.0015**	0.0286*
	(0.0094)	(0.0056)	(0.0055)	(0.0096)	(0.0052)	(0.0016)	(0.0021)	(0.0009)	(0.0053)
MTC_S	-0.0540*	-0.0059	0.0100*	-0.0712*	0.0322*	0.0199*	0.0332*	0.0042*	0.0317*
	(0.0105)	(0.0054)	(0.0061)	(0.0106)	(0.0064)	(0.0026)	(0.0038)	(0.0014)	(0.0057)
INT_S	-0.0974*	-0.0166**	-0.0199*	-0.1071*	0.0742*	0.0498*	0.0687*	0.0174*	0.0309*
	(0.0156)	(0.0070)	(0.0076)	(0.0155)	(0.0118)	(0.0073)	(0.0088)	(0.0042)	(0.0085)
GRD_S	-0.1685*	-0.0255	-0.0133	-0.1765*	0.0638*	0.0880*	0.1446*	0.0740*	0.0134
	(0.0245)	(0.0093)	(0.0124)	(0.0249)	(0.0192)	(0.0161)	(0.0199)	(0.0143)	(0.0123)
PGR_S	-0.2354*	-0.0493*	-0.0430*	-0.2398*	0.0170	0.1025*	0.1818*	0.2354*	0.031***
	(0.0297)	(0.0059)	(0.0115)	(0.0354)	(0.0221)	(0.0241)	(0.0308)	(0.0376)	(0.0179)
Age	0.0006	0.0025	0.0001	-0.0059*	0.0004	0.0002	0.0011*	0.0005*	0.0005**
	(0.0006)	(0.0023)	(0.0003)	(0.0006)	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0003)
Punjab	-0.0638*	-0.0250*	-0.0058	0.1060*	0.0033	-0.0021	-0.0045	-0.0012	-0.0069
	(0.0104)	(0.0056)	(0.0063)	(0.0105)	(0.0054)	(0.0021)	(0.0031)	(0.0020)	(0.0050)
Sindh	-0.0654*	-0.0259*	-0.0578*	0.1696*	-0.0048	0.0000	-0.0082*	-0.0023	-0.0052
	(0.0111)	(0.0063)	(0.0066)	(0.0111)	(0.0060)	(0.0026)	(0.0033)	(0.0021)	(0.0059)
Baloch	-0.1314*	-0.0277*	-0.0595*	0.1920*	-0.0007	0.0127*	0.0083**	-0.0063*	0.0127**
	(0.0110)	(0.0063)	(0.0064)	(0.0113)	(0.0061)	(0.0034)	(0.0041)	(0.0021)	(0.0059)
Constan	0.2757*	0.0537*	0.0730*	0.4176*	0.0665*	0.0127*	0.0233*	0.0095*	0.0681*
	(0.0030)	(0.0017)	(0.0018)	(0.0030)	(0.0018)	(0.0008)	(0.0011)	(0.0007)	(0.0017)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1. Standard errors are in parentheses, _F= father, _S= son.

Overall results suggest a strong persistence in both urban and rural region. Some mobility can be observed in "clerks", "Technicians and Associate Professionals" and "Professionals". This mobility is more towards lower status occupation "Skilled Agricultural and Fishery Workers" in case of rural region. However, in urban regions their probabilities increase in both higher and lower status occupations. Moreover, when occupations are merged into four categories[81], we find upward mobility in both "skill2" and "skill3" occupations in urban regions. In rural region, we observe downward mobility in occupations of "skill 3" and "skill4" towards occupations of skill2.

Impacts of both income and wealth are mixed in urban and rural regions. Increase in income and wealth leads to decrease probability of a son to fall in the lowest status occupation (elementary) and increase the probabilities to fall in the higher status occupations, "Technicians and Associate Professionals", "Professionals" and "Managers"[82], both for urban and rural regions. Occupations categorized as skill level 2, depict mixed results. In rural regions, probabilities of the sons to fall in higher status occupations increase with the increase in income and wealth[83]. Probability to choose "Clerk" as an occupation increases with increase in income and wealth in rural regions while in urban region, with the increase in income and wealth, the choice probability of "clerk" decreases. This shows that choosing "clerk" as an occupation is inferior choice in urban regions.

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[81] Results are given in table C10, appendix-C.

[82] In urban region, the change in probability to fall in "Professionals" when income changes, is insignificant.

[83] In case of "Plant and Machine Operators and Assemblers", probability decreases significantly with increase in income. Probability to fall in "Skilled Agricultural and Fishery Workers" decreases, though insignificant, when wealth increases.

Impacts of level of education of a son on occupational status are, more or less, the same in both rural and urban regions. With the increase in level of education, probabilities to fall in lower status occupations decrease while probabilities to move to higher status occupations increase in both the regions[84]. Another human capital variable-age has positive impact on the choice probabilities of high status occupations, though significant only in case of "Managers", and negative impact on the probabilities of lower status occupations in urban regions. In case of rural regions, age has negative impact only on the probability of "Skilled Agricultural and Fishery Workers" while its impact is positive on probabilities of all other occupations[85]. Finally, the provincial dummies show significant difference in changes of choice probabilities indicating heterogeneity in occupations in four provinces.

To have adequate observations in all categories and to avoid complexity in comparison, we merge occupations into four categories based on skills at province level. Results are given in table C11 and table C12, Appendix-C.

Results show high persistence in occupational choices in all four provinces except for skill3 in Sindh. In Sindh, we observe a larger downward mobility (an increase of 16.48 percentage points in skill2 if father is in skill3) as compared to upward mobility (an increase of 4.51 percentage points in skill4 if father is in skill3). Similarly, in Punjab we can also observe a larger downward mobility (an increase of 7.66 percentage points in skill2 if father is in skill3) as compared to upward mobility (an increase of 4.95 percentage points in skill4 if father is in skill3). In KP, both at skill 2 and skill3, an upward mobility can be observed towards skill4.

[84] Impact of "graduate" and "post graduate" on highest occupational status "Managers" is insignificant in case of urban region. In case of rural region the impact of "graduate" is insignificant on "Managers".
[85] However, the positive impacts of age on probabilities are significant only for higher status occupations.

Income influences the probabilities of skill1 negatively and its impacts on probabilities on skill2 and skill4 are positive in all four provinces. The impact of income is insignificant on probabilities of skill3 occupations in all four provinces. Like income, the impact of wealth is negative on the lowest status "elementary" occupations and positive (except for Balochistan) on skill2 occupations. Wealth has positive impacts on the probabilities of skill3 occupations in Sindh and Balochistan and its impact is insignificant in case of KP and Punjab. Like income, probabilities increase to choose skill4 occupations with the increase in wealth in all four provinces.

When level of education of a son increases, probabilities to fall in lower status occupations (skill1 and skill2 occupations) decrease[86] and probabilities to move to higher status occupations (skill3 and skill4 occupations) increase in all four provinces. With increase in age, the probabilities to fall in high status occupations (skill3 and skill4) increase and probabilities to fall in lower status occupations (skill1 and skill2 occupations) decrease in KP and Punjab. In Sindh, probabilities to choose skill1, skill3 and skill4 occupations increase and probability to choose skill2 occupations decreases with increase in age. In Balochistan, age is insignificant in choosing skill1 and skill4 occupations and has negative impact on the probability of skill and positive impact on the probability of skill3 occupations.

6.3.4 Summary of Occupational Mobility

We sum up this section of occupational mobility by providing a summary of major findings of our work. Majority of the fathers' and sons' generation are engaged in lower status occupations in all the regions. However, percentages of fathers are greater than the

[86] Impact of increase in level of education is positive on skill level-2 in some cases but in insignificant.

percentages of sons in high status occupations. This is true for overall Pakistan as well as for all four provinces. Relative to rural, in urban regions percentages of both fathers' and sons' generations are larger in the high status occupations.

"Sons are like their fathers" is evident from the results of transition matrices as well as from the multinomial logit regression. Strong persistence in occupations is found throughout the country. This persistence is stronger in the backward regions, the rural regions as a whole and particularly the rural regions of Balochistan and Sindh. Moreover, while persistence is strongest in the highest status occupations in urban region, it is strongest at the lowest status occupations in the rural regions. Overall persistence is strong in both lower status (especially in "Elementary", "Craft and Related Trades Workers" and "Skilled Agricultural and Fishery Workers") and in highest status (Managers) occupations. This suggests non-linearity in occupational status. Opportunities are not open equal for rich and poor. There are very limited chances for those whose fathers are in lower status occupations, to move to the higher status occupations. Despite the strong persistence we also find downward mobility in the overall occupational status of the sons generations. This is in line with findings of Motiram and Singh (2012) for India and Long and Ferrie (2013) when they use data of 19th century of US and Britain. Our results contradict with the earlier findings by Javed and Irfan (2015) who report more downward mobility in the high status occupations.

Regional based results show that mobility towards lowest status occupation (Elementary) is greater in the rural regions than the urban regions. Moreover, while sons of "Clerks" are significantly more mobile towards higher status occupations in urban regions, they are more mobile towards the lower status occupations ("Skilled Agricultural

and Fishery Workers" and Service Workers and Shop and Market Sales Workers) in the rural regions. Similarly, in the rural regions more downward mobility is observed for the sons of "Technicians and Associate Professionals" and "Professionals" towards the "Skilled Agricultural and Fishery Workers". In case of provinces, Balochistan is found to exhibit more persistence in both the lowest and highest status occupations and thus is the most bipolar province. Poor remain always poor and rich remain rich. Opportunities and chances of the sons to move towards the high status occupations are smaller in Balochistan than the other three provinces. Province Sindh comes next to Balochistan where persistence in the lower status occupations is more than Punjab and KP.

Family background and educational level of an individual are found to play important roles in the achievement of high status occupations. In all the regions, the impact of wealth and income is negative on the lowest status occupations and positive on the highest status occupations. Similarly, the chances to remain in lower status occupations decrease and the chances to move towards high status occupations increase with the increase in level of education of a son. Moreover, experience in the job market is also found to play a decisive role in the mobility towards high status occupations.

Again, the structural shift experienced by the economy in job market is not covered in our analysis. We observe a shift from agriculture sector of the economy towards services and manufacture sectors. More high status jobs are available to the sons' generation as compared to the fathers' generation. However, observing downward mobility for the sons' generation might be due to the larger rate of population growth as compared to the job vacancies at the higher status occupations.

Chapter 7

CONCLUSION

7.1 Introduction

The strength of intergenerational mobility in socio-economic status of a country represents the equality of opportunities available to the citizens. It affects motivation and efficiency of individuals and thereby overall inequality and economic growth of a country. In this study we investigated intergenerational mobility in socio-economic status for Pakistan. We extended our analysis to urban and rural regions as well as to the province level. We used level of education and occupation as a measure of socio-economic status. Specifically, we focused on the nature of transmission of educational and occupational status across the sons and fathers generations. As education cannot directly improve the standard of living of an individual rather it is a mean of getting a high status and high paid job therefore we also explored, in this study, that how adequately educational mobility is transformed to occupational mobility.

Our analysis is based upon survey data of Pakistan Social and Living Standards Measurements (PSLM, 2012-13) collected by Pakistan Bureau of Statistics, Ministry of Finance-Government of Pakistan. In the first step of our analysis, we explored the structure and distribution of levels of education and occupations in sons and fathers generations. In the second step, we estimated the strength of intergenerational mobility in educational and occupational status by utilizing transition matrices and multinomial logit

model. While transition matrices report the relative status of the sons to the status of their fathers, multinomial logit model estimate the impact of other factors, along with the status of fathers, on the status of sons. We computed the probabilities of sons to fall into different levels of educational and occupational status with the help of transition matrices. To find the impact of changes in independent variables on the educational and occupational status of a son we calculated marginal effects from the odd ratios of multinomial logit model. We provided statistical support to our method of estimation by using Brant test of proportional odd ratio and Hausman test of independence of irrelevant alternatives[87]. The reminder of the chapter proceeds as follows: Section 7.2 concludes the major findings with plausible explanations and section 7.3 presents policy implications drawn from our findings.

7.2 Conclusion

Though we observed an improvement in level of education of son's generation, but results depicted that there were very limited number of individuals who reached to high levels of education. A significant proportion of the individuals never went to school. Those who started education, a large number of them left the education before reaching colleges and universities. Situation of rural population is even worse where a large number of both sons and fathers generations are without any formal education and very small number were able to attend college and university levels of education. In provinces, Balochistan is the least uneducated land of the people. Though situations of other three provinces are also unsatisfactory but somehow they are better than Balochistan. However, in all over Pakistan we observed some improvement in the level of education

[87] While Brant test rejected the use of ordered logit, Hausman test supported the use of multinomial logit model.

of sons' generation relative to fathers' generation. Proportions of the sons are larger in high levels of education and smaller in low levels of educations as compared to their fathers. Further, we also observed that average year of education of sons is greater than average year of education of fathers in all the regions (rural, urban and provinces).

Though our results show an upward mobility in level of education but the chances to achieve higher level of education are not equal for all the sons. The highly educated fathers are more likely to transmit the same high levels of education to their sons. On the other hand, those who born in the houses of less educated fathers are less likely to get high level of educations. This persistence causes the sons of uneducated or less educated fathers to remain uneducated or less educated. As a result, both fathers and sons generations of such families experience deprivation, backwardness, inequality and poverty. However, overall our results show that on average sons are more likely to attain higher level of education relative to their fathers. Situation of educational attainments of the son's generation is worse in the rural regions as compared to the urban regions. In rural regions we observed that chances of sons had decreased to attain college and university levels of education when fathers were moved to college and university levels. Further, the average years of schooling in urban region is higher than the average years of schooling in rural region for both father and son generation.

At province level, KP was observed to be more mobile among the provinces followed by Punjab, Balochistan and Sindh. Though mobility in Balochistan was found to be higher than Sindh but average years of education in Sindh was higher, for both father and son's generations, than the average years of education in Balochistan.

Apart from level of education, income and wealth of the father also positively influence the level of education of a son. It is easy to finance less as compared to more number of children; therefore large number of family size reduces the level of education of the sons. Our results confirmed this resource dilute hypothesis and caused the level of education to decrease with the increase in family size. Finally, we also found a positive role of educated mothers in the educational attainments of the sons. With the more educated mothers, sons were found to be more likely to attain high level of education and vice versa.

Like education, majority of the fathers and sons are engaged in low status occupations. Though proportion of the son's generation has decreased in lower status agriculture and fishery related occupations but their proportions have increased in even lowest status "elementary" occupations. In the top rank occupations, the proportions of both the fathers and sons are small. Comparing with the urban regions, the proportions of both the fathers and sons are higher in lower status occupations and smaller in the high status occupations in rural regions.

Unlike education, we observed downward mobility along with strong persistence in the occupational status. Mobility towards lower status occupations is higher in rural regions as compared to the urban region. It shows that educational mobility is not properly transmitted to occupational mobility. Further, opportunities are not equal for all the sons. Sons are more likely to fall in the occupations of their fathers; that is poor remain poor and rich transmit the same fortunes to their sons. Chances of the sons whose fathers are in lower status occupations are very limited to achieve high status

occupations. On the other hand, those sons whose fathers are in high status occupations are more likely to achieve the same high status occupations.

Persistence was strong in the lower status occupations in the rural region while in urban regions, we found rigidity in high status occupations. This shows that overall, socio-economic status of urban population is higher than the socio-economic status of rural regions. At province level, Balochistan showed more persistence at both ends of the occupations dividing population into the groups of extreme rich and extreme poor. Similarly, we also found more persistence in lower status occupations in province Sindh.

Apart from occupation of a father, level of education of a son was found to be the most important determinant of the occupation of a son. With the increase in level of education a son was found to be more likely to get high status occupations. Similarly, experience of a son in job market also increased the chance of achieving high status occupations. A strong financial position of a father was found to increase the chances of getting high status occupations. In all the regions, the impact of wealth and income was negative on the lowest status occupations and positive on the highest status occupations.

7.3 Policy Implications

Though overall results suggest an upward mobility in educational attainments but we are still far behind the level of education of developed countries. Still Pakistan has to go long way. A large number of the population is not going to school especially because of their poor financial position. In order to improve socio-economic status of the citizens, government should finance the poor to relieve their financial constraint and help them to achieve high level of education. Education focused redistributive policies of the government in the form of taxation and transfer schemes may reduce financial and other

hurdles to accessing higher education. Government should make education a constitutional right, implement and enforce the minimum education laws. It should not only impose the early enrolment but also insure that a child should be in educational institution within prescribed age. For example in US there is a policy that individuals with age between 5 to 17 years must be in educational institute. The level of income of parents, then, determines the type of education of a child. Once children are in school then financial constraints of parents have less impact on children's education (Bauer and Riphahn, 2009). Early enrolment, especially in rural regions where individuals complete their levels of education late than their counterparts in the urban regions, should be insured. A careful policy to limit the family size is required as suggested by (Steelman et al., 2002; Van Bavel et al., 2011). Limiting the family size would affect the middle income group only. Family size is not an issue for the rich families. Similarly, limiting family size has no impact on low income families because it makes no difference that how many children poor parents have as they have no resources to be diluted.

Level of education of an individual is found to be the most important factor in determination of high status occupations. So improving the educational status will help in improving skills and human capital of individuals and will increase their socio-economic status. Moreover, there are limited opportunities of high status occupations in rural regions; therefore, people are engaged in the lower status occupations. This is because of farming structure of Pakistan. Government should create, like urban regions, the opportunities of high status occupations in the rural regions. For this purpose, farming should be corporatized, modernized and transform the labor to non-agriculture jobs. Corporatization and modernization of farming will create high status jobs in the rural

regions. Similarly, establishing agro-based food industries in rural areas will help the rural population to move towards high status occupations.

Our results show that opportunities for the children are based in and transmitted from the home, so reliance upon the education system or job market to increase mobility may be an overly optimistic strategy. Therefore, there is a need for institutional reforms and behavioral changes to improve the socio-economic status of the current generation. For example a son of uneducated sweeper remains uneducated sweeper because he finds it difficult to get job in other occupations and his interest to get education is limited. So there is a need to change such type of thinking and behavior.

Though it is true that parental income helps in human capital formation which determines the socio-economic status of a child and any parental credit constraint hinder investment in human capital of children, however, parenting and mentoring comparatively play more important role in the human capital formation of children. Spending more time with children and helping in solving their home assignments are keys to educational success of a child and thereby help the children in achieving high status occupations. Further, social and electronic media can also be used positively to enhance the human capital of children and help the children in social promotion.

Finally, we cannot rule out the role of family background in the status attainment of a child. Rich families invest more in the education of their children which enable them to get high status occupations. Therefore, observing perfect mobility would mean "no return" to human capital. Similarly, differences in ability due to genetic also cause persistence in educational and occupational status. Both of these factors cause intergenerational persistence in socio-economic status. Increasing intergenerational

mobility by favoring less qualified individuals would be more costly because it will create inefficiency and will reduce incentive to accumulate human capital. However, inefficiency will also arise if children of rich families use connections to get high status jobs in the presence of better qualified poor children. Therefore, government should ensure the policy of merit in order to equalize the opportunities for every talented one and eliminate nepotism from the job market.

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Appendix-A

PAKISTAN STANDARD CLASSIFICATION OF OCCUPATIONS

1- LEGISLATORS, SENIOR OFFICIALS AND MANAGERS

- **11-** Legislators and Senior Officials (Legislators, Senior Government Officials, Traditional Chiefs and Heads of Villages, Senior Officials of Special-Interest Organizations)
- **12-** Cooperate Managers (Directors and Chief Executives, Production and Operations Department Managers, Other Department Managers)
- **13-** General Managers

2- PROFESSIONALS

- **21-** Physical, Mathematical and Engineering Science Professionals (Physicists, Chemists and Related Professionals, Mathematicians, Statisticians and Related Professionals, Computing Professionals, Architects, Engineers and Related Professionals)
- **22-** Life Science and Health Professionals (Life Science Professionals, Health Professionals (Except Nursing), Nursing and Midwifery Professionals)
- **23-** Teaching Professionals (College, University and Higher Education Teaching Professionals, Secondary Education Teaching Professionals, Primary and pre-primary Education Teaching Professionals, Special Education Teaching Professionals, other Teaching Professionals)
- **24-** Other Professionals (Business Professionals, Legal Professionals, Archivists, Librarians and Related Information Professionals, Social Science and Related Professionals, Writers and Creative or Performing Artists, Religious Professionals)

3-TECHNICIANS AND ASSOCIATE PROFESSIONALS

- **31-** Physical and Engineering Science Associate Professionals (Physical and Engineering Science Technicians, Computer Associate Professionals, Optical and Electronic Equipment Operators, Ship and Aircraft Controllers and Technicians, Safety and Quality Inspectors)
- **32-** Life Science and Health Associate Professionals (Life Science Technicians and Related Associate Professionals, Modern Health Associate Professionals (Except Nursing), Nursing and Midwifery Associate Professionals, Traditional Medicine Practitioners and Faith Healers)
- **33-** Teaching Associate Professionals (Primary Education Teaching Associate Professionals, Pre-Primary Education Teaching Associate Professionals,

Special Education Teaching Associate Professionals, Other Teaching Associate Professionals)

34- Other Associate Professionals (Finance and Sales Associate Professionals, Business Services Agents and Trade Brokers, Administrative Associate Professionals, Customs, Tax and Related Government Associate Professionals, Police Inspectors and Detectives, Social Work Associate Professionals, Artistic, Entertainment and Sports Associate Professionals, Religious Associate Professionals)

4- **CLERK**

41- Office Clerks (Secretaries and Keyboard-Operating Clerks, Numerical Clerks, Material-Recording and Transport Clerks, Library, Mail and Related Clerks, Other Office Clerks)

42- Customer Services Clerks (Cashiers, Tellers and Related Clerks, Client Information Clerks)

5- **SERVICE WORKERS AND SHOP AND MARKET SALES WORKERS**

51- Personal and Protective Services Workers (Travel Attendants and Related Workers, Housekeeping and Restaurant Services Workers, Personal Care and Related Workers, Other Personal Services Workers Astrologers, Fortune-Tellers and Related Workers, Protective Services Workers)

52- Models, Salespersons and Demonstrators (Fashion and Other Models, Shop Salespersons and Demonstrators, Stall and Market Salespersons)

6- **SKILLED AGRICULTURAL AND FISHERY WORKERS**

61- Market-Oriented Skilled Agricultural and Fishery Workers (Market Gardeners and Crop Growers, Market Oriented Animal Producers and Related Workers, Market Oriented Crop and Animal Producers, Forestry and Related Workers, Fishery Workers Hunters and Trappers)

62- Subsistence Agricultural and Fishery Workers

7- **CRAFT AND RELATED TRADES WORKERS**

71- Extraction and Building Trades Workers (Miners Shotfirers, Stone Cutters and Carvers, Building Frame and Related Trades Workers, Building Finishers and Related Trades Workers, Painters, Building Structure Cleaners and Related Trades Workers)

72- Metal, Machinery and Related Trades Workers (Metal Moulders, Welders, Sheet-Metal Workers, Structural-Metal Prepares, and Related Trades Workers, Blacksmiths, Tool-Makers and Related Trades Workers, Machinery Mechanics and Fitters, Electrical and Electronic Equipment Mechanics and Fitters)

73- Precision, Handicraft, Printing and Related Trades Workers (Precision Workers in Metal and Related Materials, Potters, Glass-Makers and

Related Trades Workers, Handicraft Workers in Wood, Textile, Leather and Related Materials, Printing and Related Trades Workers)

74- Other Craft and Related Trades Workers (Food Processing and Related Trades Workers, Wood Treaters, Cabinet-Makers and Related Trades Workers, Textile Garment and Related Trades Workers, Pelt, Leather and Shoemaking Trades Workers)

8- PLANT AND MACHINE OPERATORS AND ASSEMBLERS

81- Stationary-Plant and Related Operators (Mining and Mineral Processing Plant Operators, Metal Processing Plant Operators, Glass, Ceramics and Related Plant Operators, Wood Processing and Paper Making Plant Operators, Chemical Processing Plant Operators, Power Production and Related Plant Operators, Automated Assembly Line and Industrial Robot Operators)

82- Machine Operators and Assemblers (Metal And Mineral Products Machine Operators, Chemical Products Machine Operators, Rubber and Plastic Products Machine Operators, Wood Products Machine Operators, Printing Binding and Paper Products Machine Operators, Textile, Fur And Leather Products Machine Operators, Food and Related Products Machine Operators, Assemblers, Other Machine Operators and Assemblers).

83- Drivers and Mobile-Plant Operators (Locomotive Engine Drivers and Related Workers, Motor Vehicle Drivers, Agricultural and Other Mobile Plant Operators, Ships' Deck Crews and Related Workers)

9- ELEMENTARY OCCUPATIONS

91- Sales And Services Elementary Occupations (Street Vendors And Related Workers, Shoe Cleaning And Other Street Services Elementary Occupations, Domestic And Related Helpers, Cleaners And Laundrers, Building Caretakers, Window And Related Cleaners, Messengers, Porters, Doorkeepers And Related Workers, Garbage Collectors And Related Labourers)

92- Agricultural, Fishery and Related Labourers

93- Labourers in Mining, Construction, Manufacturing and Transport (Mining and Construction Labourers, Manufacturing Labourers, Transport Labourers and Freight Handlers)

0-ARMED FORCES

01- Armed Forces

Appendix-B

Table B1: Educational Mobility-Conditional Probabilities (KP)

	Level of Educational of Sons						
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
KP - Overall							
NAS_F	29.62*	18.73*	22.28*	19.29*	5.9*	1.85*	2.33*
PMY_F	12.24*	18.36*	25.31*	26.01*	9.87*	4.17*	4.03*
MDL_F	7.46*	11.77*	28.69*	28.36*	12.6*	5.8*	5.31*
MTC_F	5.95*	6.90*	20.3*	28.69*	15.56*	9.2*	13.4*
INT_F	4.37*	5.34*	12.14*	25.73*	20.87*	15.05*	16.5*
GRD_F	0.00	3.33**	8.33*	24.17*	15*	22.5*	26.67*
PGR_F	3.74**	1.87	3.74**	14.02*	26.17*	16.82*	33.64*
KP - Urban							
NAS_F	26.02*	16.28*	26.8*	19.16*	6.76*	1.99*	2.99*
PMY_F	10.56*	17.22*	26.11*	22.22*	13.89*	6.67*	3.33*
MDL_F	10.14*	12.56*	32.37*	20.29*	10.14*	8.21*	6.28*
MTC_F	6.69*	5.02*	16.39*	24.75*	17.39*	12.04*	17.73*
INT_F	3.19**	4.26**	12.77*	22.34*	18.09*	20.21*	19.15*
GRD_F	0.00	4.00	6.00**	16.00*	18.00*	24.00*	32.00*
PGR_F	1.96	0.00	0.00	5.88**	29.41*	23.53*	39.22*
KP - Rural							
NAS_F	30.69*	19.46*	20.94*	19.33*	5.64*	1.81*	2.13*
PMY_F	12.8*	18.74*	25.05*	27.27*	8.53*	3.34*	4.27*
MDL_F	6.06*	11.36*	26.77*	32.58*	13.89*	4.55*	4.80*
MTC_F	5.45*	8.18*	22.95*	31.36*	14.32*	7.27*	10.45*
INT_F	5.36*	6.25*	11.61*	28.57*	23.21*	10.71*	14.29*
GRD_F	0.00	2.86	10.00*	30.00*	12.86*	21.43*	22.86*
PGR_F	5.36**	3.57	7.14**	21.43*	23.21*	10.71*	28.57*

Note: where* $P < 0.01$, ** $P < 0.05$, *** $P < 0.1$. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F = father, _S= Son.

Table B1: Educational Mobility-Conditional Probabilities (Punjab)

	Level Of Educational of Sons						
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
Punjab – Overall							
NAS_F	32.43*	26.19*	25.08*	11.8*	2.98*	0.97*	0.55*
PMY_F	12.88*	25.4*	34.12*	18.35*	5.69*	2.09*	1.47*
MDL_F	9.65*	16.3*	36.13*	22.78*	8.7*	3.74*	2.7*
MTC_F	4.93*	9.46*	27.33*	32.11*	12.02*	8.16*	5.99*
INT_F	2.06*	4.49*	19.07*	26.92*	18.13*	14.39*	14.95*
GRD_F	3.18*	2.55*	7.96*	21.02*	14.65*	21.02*	29.62*
PGR_F	2.52*	1.08***	9.35*	14.03*	14.03*	17.99*	41.01*
Punjab – Urban							
NAS_F	26.57*	25.59*	27.3*	14.1*	4.02*	1.37*	1.07*
PMY_F	9.59*	22.6*	34.53*	20.58*	7.56*	3.43*	1.71*
MDL_F	7.66*	14.59*	34.26*	24.93*	9.6*	4.71*	4.25*
MTC_F	3.75*	9.51*	23.85*	33.61*	12.18*	9.42*	7.67*
INT_F	2.21*	3.31*	17.96*	26.24*	19.34*	15.47*	15.47*
GRD_F	2.39*	1.59**	4.38*	20.32*	13.94*	23.11*	34.26*
PGR_F	2.17**	0.43	5.22*	13.48*	14.78*	18.7*	45.22*
Punjab – Rural							
NAS_F	35.03*	26.46*	24.09*	10.78*	2.52*	0.8*	0.32*
PMY_F	15.54*	27.67*	33.8*	16.55*	4.17*	1.01*	1.26*
MDL_F	11.42*	17.83*	37.8*	20.87*	7.89*	2.88*	1.31*
MTC_F	6.54*	9.4*	32.11*	30.05*	11.81*	6.42*	3.67*
INT_F	1.73***	6.94*	21.39*	28.32*	15.61*	12.14*	13.87*
GRD_F	6.35**	6.35**	22.22*	23.81*	17.46*	12.7*	11.11*
PGR_F	4.17	4.17	29.17*	16.67*	10.42**	14.58*	20.83*

Note: where* $P < 0.01$, ** $P < 0.05$, *** $P < 0.1$. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F = father, _S= Son.

Table B3: Educational Mobility-Conditional Probabilities (Sindh)

	Level Of Educational of Sons						
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
Sindh – Overall							
NAS_F	48.48*	21.21*	11.59*	11.31*	5.18*	1.57*	0.66*
PMY_F	22.12*	25.91*	14.94*	19.23*	11.87*	4.11*	1.81*
MDL_F	10.48*	16.4*	20.43*	28.49*	16.13*	4.7*	3.36*
MTC_F	7.42*	11.86*	13.03*	26.38*	19.49*	13.56*	8.26*
INT_F	6.27*	7.77*	9.27*	21.05*	26.07*	19.3*	10.28*
GRD_F	4.5*	6.31*	6.31*	13.81*	21.62*	23.72*	23.72*
PGR_F	1.96*	2.52*	2.52*	7.56*	21.57*	22.41*	41.46*
Sindh – Urban							
NAS_F	33.59*	17.32*	19.76*	17.11*	8.17*	2.86*	1.19*
PMY_F	13.21*	20.05*	17.65*	24.85*	14.17*	7.08*	3*
MDL_F	8.07*	12.95*	21.58*	32.08*	16.7*	5.07*	3.56*
MTC_F	6.22*	8.89*	12.89*	27.26*	19.7*	14.81*	10.22*
INT_F	4.62*	3.3*	9.24*	22.44*	28.38*	20.79*	11.22*
GRD_F	1.72**	3.02*	5.17*	14.22*	19.83*	27.16*	28.88*
PGR_F	0.78	1.56**	2.73*	6.25*	17.97*	23.83*	46.88*
Sindh – Rural							
NAS_F	54.5*	22.78*	8.29*	8.97*	3.98*	1.04*	0.45*
PMY_F	27.5*	29.45*	13.31*	15.85*	10.49*	2.32*	1.09*
MDL_F	16.59*	25.12*	17.54*	19.43*	14.69*	3.79*	2.84*
MTC_F	10.41*	19.33*	13.38*	24.16*	18.96*	10.41*	3.35*
INT_F	11.46*	21.88*	9.38*	16.67*	18.75*	14.58*	7.29*
GRD_F	10.89*	13.86*	8.91*	12.87*	25.74*	15.84*	11.88*
PGR_F	4.95**	4.95**	1.98	10.89*	30.69*	18.81*	27.72*

Note: where* $P < 0.01$, ** $P < 0.05$, *** $P < 0.1$. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F = father, _S= Son.

Table B4: Educational Mobility-Conditional Probabilities (Balochistan)

	Level of Educational of Sons						
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
Balochistan – Overall							
NAS_F	45.59*	26.8*	11.72*	11.18*	2.97*	1.18*	0.56*
PMY_F	11.1*	26.55*	22.99*	28.14*	5.94*	3.3*	1.98*
MDL_F	7.03*	18.38*	20.27*	34.32*	9.73*	6.49*	3.78*
MTC_F	3.73*	12.53*	15.2*	42.13*	14.93*	8*	3.47*
INT_F	3.31*	9.93*	15.23*	46.36*	17.88*	4.64*	2.65**
GRD_F	3.26*	1.09	10.87*	34.78*	14.13*	17.39*	18.48*
PGR_F	0.00	3.33***	3.33***	17.78*	20*	24.44*	31.11*
Balochistan – Urban							
NAS_F	26.09*	25.26*	14.81*	20.45*	8.34*	3.41*	1.65*
PMY_F	7.65*	19.41*	20.59*	31.76*	8.82*	7.65*	4.12*
MDL_F	6.9*	15.52*	19.83*	29.31*	11.21*	8.62*	8.62*
MTC_F	3.07**	10.43*	14.11*	34.97*	20.25*	12.27*	4.91*
INT_F	0.00	12.82*	12.82**	35.9*	20.51*	12.82**	5.13
GRD_F	7.89***	0.00	0.00	23.68	7.89	26.32	34.21**
PGR_F	0.00	0.00	4.08	10.2**	16.33*	32.65*	36.73*
Balochistan – Rural							
NAS_F	48.97*	27.06*	11.19*	9.58*	2.04*	0.79*	0.37*
PMY_F	12.1*	28.62*	23.68*	27.09*	5.11*	2.04*	1.36*
MDL_F	7.09*	19.69*	20.47*	36.61*	9.06*	5.51*	1.57**
MTC_F	4.25*	14.15*	16.04*	47.64*	10.85*	4.72*	2.36**
INT_F	4.46**	8.93*	16.07*	50*	16.96*	1.79	1.79
GRD_F	0.00	1.85	18.52*	42.59*	18.52*	11.11*	7.41**
PGR_F	0.00	7.32***	2.44	26.83*	24.39*	14.63*	24.39*

Note: where* P < 0.01, ** P < 0.05, *** P < 0.1. NAS= Never attend school, PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PG= Post Graduate, _F = father, _S= Son.

Table B5: Ordered Logit Regression: Educational Mobility

LR $\chi^2(15)$	=	20168.57
Prob. $>\chi^2$	=	0.0000
Pseudo R^2	=	0.1437
PMY_F	0.716*	(0.0261)
MDL_F	0.902*	(0.0318)
MTC_F	1.386*	(0.0330)
INT_F	1.827*	(0.0538)
GRD_F	2.334*	(0.0667)
PGR_F	2.920*	(0.0711)
Income	0.007*	(0.0024)
Wealth	0.071*	(0.0010)
H. Size	-0.030*	(0.0027)
Age	0.188*	(0.0082)
Age Square	-0.003*	(0.0001)
Region	0.195*	(0.0229)
Punjab	-0.620*	(0.0276)
Sindh	-0.302*	(0.0307)
Baloch	-0.227*	(0.0321)
Constant cut1	3.848*	(0.1190)
Constant cut2	5.059*	(0.1200)
Constant cut3	6.243*	(0.1210)
Constant cut4	7.644*	(0.1230)
Constant cut5	8.691*	(0.1250)
Constant cut6	9.705*	(0.1270)

	chi2	**P>χ^2**	**d.f.**
All	2422.8	0.000	75
PMY_F	118.52	0.000	5
MDL_F	58.89	0.000	5
MTC_F	25.61	0.000	5
INT_F	7.91	0.161	5
GRD_F	16.05	0.007	5
PGR_F	13.64	0.018	5
Income	24.12	0.000	5
Wealth	51.39	0.000	5
H. size	20.55	0.001	5
Age	236.68	0.000	5
Age Square	138.88	0.000	5
Region	6.01	0.305	5
Punjab	240.66	0.000	5
Sindh	251.37	0.000	5
Balochistan	150.27	0.000	5

Table B6: Multinomial Logit Regression (Odd Ratios): Educational Mobility (Pakistan-Overall)

LR χ^2 (84) = 22512.31	Pseudo R^2 = 0.1604	N=39989
Prob.>χ^2 = 0.0000	Log likelihood = -58903	

	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F	0.869*	1.053*	1.208*	1.357*	1.458*	1.336*
	(0.0449)	(0.0472)	(0.0506)	(0.0679)	(0.102)	(0.125)
MDL_F	0.723*	1.301*	1.509*	1.720*	1.832*	1.833*
	(0.0693)	(0.0653)	(0.0683)	(0.0841)	(0.115)	(0.132)
MTC_F	0.744*	1.403*	2.076*	2.363*	2.867*	2.842*
	(0.0862)	(0.0800)	(0.0793)	(0.0910)	(0.110)	(0.123)
INT_F	0.717*	1.472*	2.312*	3.040*	3.568*	3.527*
	(0.183)	(0.167)	(0.161)	(0.168)	(0.184)	(0.195)
GRD_F	0.327	0.821***	1.885*	2.637*	3.675*	3.935*
	(0.258)	(0.234)	(0.214)	(0.220)	(0.227)	(0.233)
PGR_F	0.0679	0.791*	1.695*	3.074*	3.930*	4.707*
	(0.341)	(0.290)	(0.268)	(0.264)	(0.273)	(0.274)
Income	0.0112	0.0371*	0.0434*	0.0448*	0.0455*	0.0461*
	(0.0095)	(0.0088)	(0.0088)	(0.0091)	(0.0093)	(0.0091)
Wealth	0.0352*	0.0736*	0.0968*	0.113*	0.142*	0.175*
	(0.0017)	(0.0019)	(0.0020)	(0.0027)	(0.0036)	(0.0040)
H. Size	0.00185	-0.0193*	-0.0415*	-0.0460*	-0.0532*	-0.0739*
	(0.0045)	(0.0047)	(0.0050)	(0.0065)	(0.0082)	(0.0090)
Age	0.0165	0.112*	0.247*	0.359*	0.607*	0.752*
	(0.0129)	(0.0142)	(0.0153)	(0.0214)	(0.0311)	(0.0362)
Age Sq.	-0.0005**	-0.0020*	-0.0037*	-0.0053*	-0.0087*	-0.0106*
	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0005)	(0.0006)
Rural	0.164*	0.239*	0.365*	0.396*	0.324*	0.500*
	(0.0413)	(0.0417)	(0.0442)	(0.0569)	(0.0740)	(0.0818)
Punjab	0.172*	-0.110**	-0.723*	-0.998*	-1.099*	-1.650*
	(0.0500)	(0.0483)	(0.0521)	(0.0688)	(0.0907)	(0.0938)
Sindh	-0.122**	-0.814*	-0.548*	-0.114	-0.154***	-0.790*
	(0.0532)	(0.0552)	(0.0563)	(0.0706)	(0.0939)	(0.0999)
Baloch	0.183*	-0.520*	-0.131**	-0.366*	-0.105	-0.734*
	(0.0535)	(0.0567)	(0.0575)	(0.0815)	(0.110)	(0.126)
Constant	-1.734*	-4.063*	-7.199*	-10.68*	-16.92*	-20.64*
	(0.189)	(0.207)	(0.229)	(0.325)	(0.492)	(0.589)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1 and standard errors are in parentheses. PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Table B7: Multinomial Logit Regression (Odd Ratios): Educational Mobility-Urban

LR χ^2 (84) = 8427.02	Pseudo R^2 = 0.159	N = 14223
Prob. $>\chi^2$ = 0.0000	Log likelihood = -22287	

	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F	0.880*	0.968*	1.155*	1.320*	1.689*	1.261*
	(0.0869)	(0.0853)	(0.0908)	(0.113)	(0.152)	(0.193)
MDL_F	0.653*	1.090*	1.292*	1.403*	1.654*	1.770*
	(0.110)	(0.102)	(0.106)	(0.127)	(0.166)	(0.185)
MTC_F	0.683*	1.079*	1.819*	2.028*	2.694*	2.672*
	(0.127)	(0.116)	(0.115)	(0.131)	(0.156)	(0.174)
INT_F	0.274	1.078*	1.822*	2.533*	3.201*	3.025*
	(0.274)	(0.230)	(0.223)	(0.231)	(0.250)	(0.266)
GRD_F	0.0429	0.192	1.632*	2.259*	3.515*	3.755*
	(0.398)	(0.350)	(0.310)	(0.319)	(0.325)	(0.333)
PGR_F	-0.408	0.489	1.489*	2.800*	3.895*	4.609*
	(0.576)	(0.425)	(0.394)	(0.388)	(0.396)	(0.399)
Income	-0.0054	0.0552*	0.0515*	0.0534*	0.0531*	0.0550*
	(0.0216)	(0.0180)	(0.0181)	(0.0182)	(0.0183)	(0.0182)
Wealth	0.0304*	0.0697*	0.0998*	0.129*	0.154*	0.191*
	(0.004)	(0.004)	(0.0041)	(0.0049)	(0.0055)	(0.006)
H. Size	0.0152***	-0.0272*	-0.0508*	-0.0553*	-0.0833*	-0.0961*
	(0.0081)	(0.0082)	(0.0085)	(0.0100)	(0.0119)	(0.0128)
Age	0.0155	0.122*	0.321*	0.442*	0.638*	0.778*
	(0.0245)	(0.0246)	(0.0263)	(0.0331)	(0.0420)	(0.0473)
Age Sq.	-0.00046	-0.00204*	-0.00467*	-0.00636*	-0.00896*	-0.0108*
	(0.0004)	(0.0004)	(0.00045)	(0.0006)	(0.0007)	(0.0008)
Punjab	0.393*	0.004	-0.248**	-0.717*	-0.874*	-1.252*
	(0.101)	(0.0914)	(0.0988)	(0.119)	(0.140)	(0.144)
Sindh	-0.00717	-0.516*	-0.120	0.0160	-0.0845	-0.567*
	(0.107)	(0.0988)	(0.103)	(0.121)	(0.142)	(0.148)
Baloch	0.530*	-0.291**	0.523*	0.401*	0.642*	0.149
	(0.125)	(0.125)	(0.125)	(0.152)	(0.179)	(0.198)
Constant	-1.818*	-4.124*	-8.791*	-12.81*	-18.01*	-22.13*
	(0.359)	(0.362)	(0.400)	(0.517)	(0.676)	(0.784)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1 and standard errors are in parentheses. PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Table B8: Multinomial Logit Regression (Odd Ratios): Educational Mobility- Rural

LR χ^2 (84) =11425.61 Prob.>χ^2 =0.0000			Pseudo R^2=0.1356 Log likelihood=-36420			N=25766
	PMY_S	**MDL_S**	**MTC_S**	**INT_S**	**GRD_S**	**PGR_S**
PMY_F	0.862*	1.100*	1.224*	1.339*	1.158*	1.410*
	(0.0527)	(0.0573)	(0.0617)	(0.0870)	(0.148)	(0.167)
MDL_F	0.780*	1.418*	1.639*	1.988*	2.038*	1.852*
	(0.0899)	(0.0857)	(0.0901)	(0.113)	(0.163)	(0.199)
MTC_F	0.801*	1.672*	2.259*	2.623*	3.047*	2.990*
	(0.120)	(0.111)	(0.110)	(0.128)	(0.161)	(0.182)
INT_F	1.065*	1.733*	2.641*	3.347*	3.853*	4.115*
	(0.248)	(0.241)	(0.229)	(0.243)	(0.276)	(0.288)
GRD_F	0.542	1.363*	1.988*	2.801*	3.668*	3.776*
	(0.342)	(0.313)	(0.295)	(0.305)	(0.326)	(0.344)
PGR_F	0.362	1.054*	1.767*	3.152*	3.772*	4.586*
	(0.432)	(0.397)	(0.367)	(0.360)	(0.388)	(0.385)
Income	0.017	0.021***	0.050*	0.047*	0.033**	0.050*
	(0.0106)	(0.0107)	(0.0106)	(0.0125)	(0.0156)	(0.0129)
Wealth	0.037*	0.074*	0.095*	0.107*	0.137*	0.160*
	(0.0019)	(0.0022)	(0.0024)	(0.0034)	(0.0052)	(0.0060)
H. Size	-0.006	-0.015**	-0.039*	-0.047*	-0.025**	-0.055*
	(0.0054)	(0.0058)	(0.0063)	(0.0088)	(0.0120)	(0.0138)
Age	0.019	0.113*	0.208*	0.312*	0.615*	0.812*
	(0.0153)	(0.0177)	(0.0193)	(0.0296)	(0.0506)	(0.0644)
Age Sq.	-0.001*	-0.002*	-0.003*	-0.005*	-0.009*	-0.012*
	(0.0001)	(0.0003)	(0.0003)	(0.0005)	(0.0008)	(0.0011)
Punjab	0.099***	-0.095***	-0.911*	-1.138*	-1.151*	-1.950*
	(0.0577)	(0.0571)	(0.0623)	(0.0878)	(0.128)	(0.138)
Sindh	-0.140**	-0.995*	-0.715*	-0.051	0.136	-0.646*
	(0.0615)	(0.0696)	(0.0698)	(0.0905)	(0.136)	(0.152)
Baloch	0.115***	-0.535*	-0.319*	-0.651*	-0.356**	-1.161*
	(0.0599)	(0.0647)	(0.0656)	(0.101)	(0.149)	(0.177)
Constant	-1.542*	-3.856*	-6.082*	-9.245*	-16.66*	-20.32*
	(0.214)	(0.247)	(0.274)	(0.424)	(0.762)	(0.987)

Note: * P < 0.01, ** P < 0.05, *** P < 0.1 and standard errors are in parentheses. PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Table B9: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (KP)

LR χ^2 (72)=2623 Prob. >χ^2= 0.0000		Pseudo R^2 = 0.1131 Log likelihood = -10290			N = 6444		
		PMY_S	**MDL_S**	**MTC_S**	**INT_S**	**GRD_S**	**PGR_S**
PMY_F		0.760*	0.764*	0.859*	0.994*	1.191*	0.807*
	*-0.118**	***0.024****	***0.0219***	***0.0362****	***0.022****	***0.014*****	***0.0009***
MDL_F		0.796*	1.363*	1.468*	1.748*	2.059*	1.682*
	*-0.165**	***-0.0395****	***0.0563****	***0.064****	***0.045****	***0.0267****	***0.0123***
MTC_F		0.438**	1.119*	1.535*	1.950*	2.424*	2.471*
	*-0.160**	***-0.0752****	***-0.0030***	***0.076****	***0.065****	***0.042****	***0.0556****
INT_F		0.455	0.749***	1.507*	2.252*	2.872*	2.550*
	*-0.158**	***-0.0714****	***-0.072****	***0.064*****	***0.107****	***0.074****	***0.0563****
GRD_F		14.95	15.21	16.16	16.61	17.84	17.56
	*-0.258**	***-0.0618***	***-0.073*****	***0.1063****	***0.076****	***0.115****	***0.0958****
PGR_F		-0.586	-0.406	0.939	2.518*	2.972*	3.246*
	*-0.123***	***-0.1246****	***-0.166****	***-0.0232***	***0.198****	***0.0899****	***0.1491****
Income		0.00541	0.0544**	0.0902*	0.111*	0.129*	0.0997*
	*-0.008***	***-0.006****	***0.0004***	***0.0067****	***0.0039****	***0.0021****	***0.001****
Wealth		0.0313*	0.0653*	0.0842*	0.104*	0.129*	0.159*
	*-0.01**	***-0.003****	***0.0013****	***0.0038****	***0.0025****	***0.0017****	***0.0035****
H. Size		0.0215**	-0.017***	-0.0358*	-0.0439*	-0.0611*	-0.0926*
	0.0023*	***0.0054****	***0.0002***	***-0.0028****	***-0.0013*****	***-0.001*****	***-0.0028****
Age		-0.0147	0.0737**	0.268*	0.305*	0.571*	0.675*
	*-0.021**	***-0.0199****	***-0.0164****	***0.0187****	***0.0071****	***0.0119****	***0.0192****
Age Sq.		-0.000297	-0.0013**	-0.00411*	-0.00458*	-0.00806*	-0.00966*
	0.0003*	***0.0002****	***0.0002****	***-0.0003****	***-0.0001*****	***-0.0002****	***-0.0003****
Rural		0.311*	0.311*	0.767*	0.598*	0.513*	0.864*
	*-0.069**	***-0.0038***	***-0.0176***	***0.0669****	***0.0099***	***-0.0017***	***0.0153****
Constant		-1.311**	-3.367*	-7.376*	-9.710*	-16.20*	-18.64*
	0.211*	***0.157****	***0.221****	***0.222****	***0.091****	***0.044****	***0.055****

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Table B10: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Punjab)

LR χ^2 (72) = 8050.75 Prob. $>\chi^2$ = 0.0000				Pseudo R^2 =0.146 Log likelihood = -23553			N = 15981
		PMY_S	**MDL_S**	**MTC_S**	**INT_S**	**GRD_S**	**PGR_S**
PMY_F		0.749*	0.967*	0.999*	1.131*	1.166*	1.246*
	*-0.122**	***0.01****	***0.0589****	***0.029****	***0.0140****	***0.0055***	***0.0050***
MDL_F		0.479*	1.086*	1.193*	1.484*	1.629*	1.680*
	*-0.124**	*-0.0552**	***0.0777****	***0.0473****	***0.0296****	***0.0142***	***0.0104****
MTC_F		0.532*	1.314*	1.940*	2.145*	2.660*	2.609*
	*-0.155**	*-0.0977**	***0.0312****	***0.1212****	***0.0449****	***0.0354***	***0.0205****
INT_F		0.648***	1.722*	2.433*	3.159*	3.735*	3.938*
	*-0.187**	*-0.1344**	***0.0105***	***0.1063****	***0.0922****	***0.0631***	***0.0490****
GRD_F		-0.607	0.00740	1.218*	1.888*	2.956*	3.290*
	-0.064	*-0.1519**	*-0.1164**	***0.0835****	***0.0730****	***0.0937***	***0.0818****
PGR_F		-1.111	0.545	1.198*	2.203*	3.090*	3.797*
	*-0.084****	*-0.1928**	*-0.0457*	***0.0397***	***0.0877****	***0.0845***	***0.1108****
Income		0.00419	0.0374*	0.0373*	0.0357*	0.0349*	0.0389*
	*-0.0031***	*-0.0032**	***0.0038****	***0.0018****	***0.0004****	***0.0001****	***0.0002****
Wealth		0.0420*	0.0824*	0.117*	0.142*	0.166*	0.203*
	*-0.01**	*-0.0039**	***0.0022****	***0.0050****	***0.0026****	***0.0017****	***0.0023****
H. Size		-0.0118	-0.0316*	-0.0719*	-0.0864*	-0.124*	-0.146*
	0.005*	***0.0035****	***0.0017****	*-0.0041**	*-0.0018**	*-0.0018**	*-0.0020**
Age		-0.0118	0.0786*	0.191*	0.261*	0.489*	0.605*
	*-0.01**	*-0.0170**	*-0.0060***	***0.0089****	***0.0052****	***0.0089****	***0.0101****
Age Sq.		0.00007	-0.00133*	-0.00262*	-0.00356*	-0.00682*	-0.00840*
	0.0002*	***0.0002****	***0.00004***	*-0.0001***	*-0.0001***	*-0.0001**	*-0.0001**
Rural		0.159**	0.377*	0.395*	0.434*	0.326*	0.341**
	*-0.038**	*-0.0138***	***0.0295****	***0.0164****	***0.0072****	*-0.0005*	*-0.0003*
Constant		-1.257*	-3.997*	-7.670*	-11.07*	-16.46*	-20.45*
	0.20*	***0.21****	***0.28****	***0.18****	***0.064****	***0.063****	***0.039****

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son

Table B11: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Sindh)

LR χ^2 (72) = 6397.3 Prob. >χ^2 = 0.0000		Pseudo R^2 =0.1805 Log likelihood = -14525.089				N = 9971	
		PMY_S	**MDL_S**	**MTC_S**	**INT_S**	**GRD_S**	**PGR_S**
PMY_F		0.919*	0.895*	1.171*	1.442*	1.531*	1.505*
	*-0.187**	***0.0519****	***0.0103***	***0.0499****	***0.0495****	***0.0178****	***0.007****
MDL_F		1.017*	1.299*	1.607*	1.786*	1.622*	2.076*
	*-0.224**	***0.0257***	***0.034****	***0.0851****	***0.0571****	***0.0090***	***0.0131****
MTC_F		1.057*	1.277*	2.002*	2.437*	3.143*	3.328*
	*-0.257**	***-0.0132***	***-0.016****	***0.0905****	***0.09****	***0.0692****	***0.0361****
INT_F		0.840*	1.113*	1.922*	2.816*	3.518*	3.433*
	*-0.254**	***-0.0483****	***-0.038****	***0.0613****	***0.1479****	***0.0976****	***0.0338****
GRD_F		0.864**	1.009*	1.748*	2.802*	3.896*	4.457*
	*-0.255**	***-0.047*****	***-0.0521****	***0.0161***	***0.1236****	***0.1253****	***0.0896****
PGR_F		0.799	0.910***	1.973*	3.573*	4.650*	5.892*
	*-0.290**	***-0.0937****	***-0.0871****	***-0.0197***	***0.1746****	***0.1367****	***0.1795****
Income		-0.041***	-0.0469**	-0.0544*	-0.00751	-0.00967	-0.0161
	*0.0065**	***-0.0032***	***-0.0024***	***-0.0042****	***0.0022****	***0.0009***	***0.0002***
Wealth		0.0335*	0.0721*	0.0854*	0.100*	0.123*	0.162*
	-.01	***-0.0017****	***0.0020****	***0.0033****	***0.0026****	***0.0016****	***0.0022****
H. Size		0.00348	-0.0218**	-0.0291*	-0.0264**	-0.00885	-0.0175
	0.002	***0.0023****	***-0.0012***	***-0.0024****	***-0.0012***	***0.0005***	***0.00001***
Age		0.0509**	0.218*	0.320*	0.443*	0.682*	0.961*
	*-0.033**	***-0.0189****	***0.0007***	***0.0095****	***0.0119****	***0.0129****	***0.0169****
Age Sq.		-0.00103**	-0.0038*	-0.00483*	-0.00646*	-0.00951*	-0.0134*
	0.0005*	***0.0002****	***-0.0001***	***-0.0001****	***-0.0002****	***-0.0002****	***-0.0002****
Rural		0.280*	-0.0577	0.199**	0.541*	0.502*	0.869*
	*-.036**	***0.0240****	***-0.0303****	***-0.0056***	***0.0257****	***0.0053***	***0.0169****
Constant		-2.385*	-5.906*	-8.259*	-11.83*	-18.14*	-25.29*
	0.31*	***0.19****	***0.125****	***0.16****	***0.11****	***0.057****	***0.045****

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space..PMY = Primary school, MDL=Middle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son

Table B12: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Balochistan)

LR $\chi^2(27) = 3412$ Prob.>$\chi^2 = 0.0000$		Pseudo $R^2 = 0.1798$ Log likelihood = -7784		N = 7593
	NAS_S	**BMTC_S**	**MTC_S**	**AMTC_S**
BMTC_F		1.476*	2.130*	2.144*
	*-0.278**	*0.1037**	*0.1312**	*0.0433**
MTC_F		1.792*	3.155*	3.306*
	*-0.332**	*-0.0023*	*0.2438**	*0.0908**
AMTC_F		1.643*	3.275*	4.258*
	*-0.338**	*-0.0915**	*0.2132**	*0.2160**
Income		0.0550*	0.104*	0.0933*
	*-0.012**	*0.0035*	*0.0069**	*0.002****
Wealth		0.0436*	0.0889*	0.126*
	*-0.010**	*0.0011***	*0.0049**	*0.0044**
H. Size		0.0004	-0.0126	-0.0137
	0.0005	*0.0012*	*-0.0012*	*-0.0005*
Age		0.0601**	0.314***	0.718***
	*-0.027**	*-0.0238**	*0.0158**	*0.0346**
Age Sq.		-0.0013**	-0.0054*	-0.0113*
	*0.0005**	*0.0003**	*-0.0003**	*-0.0005**
Rural		-0.0650	0.0434	-0.349*
	*0.0116**	*-0.0082*	*0.0186***	*-0.022**
Constant	*0.36**	*0.38**	*0.168**	*0.09**

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.MTC= Matric, BMTC= Below Matric, AMTC=Above Matric, _F = father, _S = son.

Table B13: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Including Mothers' Education)-Pakistan-Overall

LR χ^2 (102) = 13203 Prob. $>\chi^2$ = 0.0000			Pseudo R^2 = 0.1709 Log likelihood = -32036			N=21898	
	NAS_S	**PMY_S**	**MDL_S**	**MTC_S**	**INT_S**	**GRD_S**	**PGR_S**
PMY_F		0.838*	1.052*	1.189*	1.345*	1.421*	1.647*
	*-0.152**	***0.0196****	***0.0411****	***0.0466****	***0.0246****	***0.0100****	***0.0105****
MDL_F		0.651*	1.135*	1.392*	1.526*	1.686*	1.900*
	*-0.155**	***-0.0268****	***0.0476****	***0.0736****	***0.0316****	***0.0150****	***0.0134****
MTC_F		0.740*	1.295*	1.956*	2.210*	2.640*	2.923*
	*-0.188**	***-0.0589****	***0.0070***	***0.1173****	***0.0560****	***0.0365****	***0.0298****
INT_F		0.602*	1.125*	1.889*	2.489*	2.993*	3.158*
	*-0.182**	***-0.0742****	***-0.0224***	***0.0980****	***0.0882****	***0.0565****	***0.0363****
GRD_F		0.426	0.853**	1.977*	2.705*	3.525*	4.088*
	*-0.182**	***-0.0993****	***-0.0735****	***0.0930****	***0.0971****	***0.0840****	***0.0812****
PGR_F		0.396	0.823***	1.760*	3.038*	3.860*	5.004*
	*-0.187**	***-0.1088****	***-0.0891****	***0.0167***	***0.1215****	***0.0911****	***0.1559****
Income		0.014	0.027**	0.051*	0.055*	0.056*	0.056*
	*-0.004**	***-0.0013***	***-0.0001***	***0.0033****	***0.0013****	***0.0005****	***0.0003****
Wealth		0.025*	0.053*	0.07*	0.083*	0.10*	0.121*
	*-0.009**	***-0.0026****	***0.0023****	***0.0040****	***0.0022****	***0.0014****	***0.0019****
H.Size		0.00523	-0.0163**	-0.039**	-0.038*	-0.047*	-0.051*
	*0.002**	***0.0033****	***0.00001***	***-0.0032***	***-0.0009****	***-0.0006*****	***-0.0005*****
BMTC_M		0.370*	0.789*	0.959*	0.902*	0.897*	0.959*
	*-0.096**	***-0.0200****	***0.0408****	***0.0539****	***0.0135****	***0.0037***	***0.0039***
A. MTC_M		-0.101	0.534***	0.944*	1.426*	1.602*	1.771*
	*-0.062**	***-0.0895****	***0.0071***	***0.0526****	***0.0472****	***0.0233****	***0.0211****
Age		0.0174	0.136*	0.286*	0.425*	0.681*	0.838*
	*-0.022**	***-0.0199****	***-0.0062****	***0.0111****	***0.0104****	***0.0122****	***0.0138***
Age Sq.		-0.00053	-0.002*	-0.004*	-0.006*	-0.010*	-0.012*
	*0.0034**	***0.0003****	***0.00004***	***-0.00016****	***-0.00016****	***-0.00017****	***-0.00019****
Rural		0.195*	0.271*	0.407*	0.478*	0.325*	0.452*
	*-0.041**	0.0001	0.005	0.022*	0.012*	-0.0011	0.0025
Punjab		0.235*	-0.153**	-0.798*	-1.030*	-1.262*	-1.903*
	*0.028**	***0.0787****	***0.0369****	***-0.0613****	***-0.0292****	***-0.0156****	***-0.0372****
Sindh		-0.0801	-0.902*	-0.607*	-0.169***	-0.310**	-1.104*
	*0.065**	***0.0404****	***-0.0883****	***-0.0331****	***0.0308****	***0.0116*****	***-0.0262****
Baloch		0.210*	-0.621*	-0.206*	-0.424*	-0.304**	-0.954*
	*0.025**	***0.0650****	***-0.0743****	***0.0131***	***-0.0087***	***0.0045***	***-0.0247****
Constant	*0.25**	***0.203****	***0.204****	***0.182****	***0.078****	***0.042****	***0.039****

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.BMTC_M= mother with below matric, A.MTC_M = mother with matric and above matric

Table B14: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Including Mothers' Education) -Urban

LR $\chi^2(102) = 4966$ Prob.>$\chi^2 = 0.0000$			Pseudo $R^2 = 0.177$ Log likelihood = -11488			N=7455	
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F		0.797*	0.899*	0.989*	1.175*	1.527*	1.413*
	-0.100	*0.0071*	*0.0153*	*0.0168*	*0.0216***	*0.0269**	*0.0118*
MDL_F		0.644*	0.925*	1.130*	1.248*	1.523*	1.888*
	*-0.100**	*-0.0196*	*0.0128*	*0.0364***	*0.0205****	*0.0200***	*0.0301**
MTC_F		0.670*	0.918*	1.525*	1.685*	2.406*	2.602*
	*-0.115**	*-0.0404**	*-0.0408**	*0.0615**	*0.0298***	*0.0573**	*0.0472**
INT_F		0.389	0.693**	1.281*	1.955*	2.617*	2.642*
	*-0.104**	*-0.0584**	*-0.0629**	*0.0172*	*0.0772**	*0.0818**	*0.0490**
GRD_F		-0.394	0.235	1.418*	1.938*	3.086*	3.566*
	*-0.092**	*-0.1115**	*-0.1235**	*0.0383*	*0.0522***	*0.1179**	*0.1189**
PGR_F		0.773	0.768	1.87***	3.157*	4.336*	5.396*
	*-0.145**	*-0.0841***	*-0.1559**	*-0.0646**	*0.0793**	*0.1347**	*0.2361**
Income		-0.0268	0.020	0.044**	0.0442*	0.048**	0.05***
	-0.0013	*-0.0058***	*0.0004*	*0.0039**	*0.0014***	*0.0008***	*0.0004****
Wealth		0.0211***	0.0506*	0.0708*	0.0904*	0.107*	0.132*
	*-0.0067**	*-0.0041**	*-0.0001*	*0.0025**	*0.0026**	*0.0022**	*0.0036**
H.Size		0.00528	-0.0263**	-0.0518*	-0.0380**	-0.0846*	-0.0789*
	*0.0025***	*0.0040**	*0.0003*	*-0.0034***	*0.0007*	*-0.0025**	*-0.0015****
BMTC_M		0.334**	0.878*	1.044*	0.973*	0.835*	0.985*
	*-0.074**	*-0.0397**	*0.0394**	*0.0578**	*0.0156****	*-0.0039*	*0.0054*
A. MTC_M		0.183	0.813**	1.212*	1.748*	1.765*	1.989*
	*-0.081**	*-0.0730**	*-0.0041*	*0.0384***	*0.0603**	*0.0276**	*0.0323**
Age		0.0139	0.140*	0.357*	0.563*	0.710*	0.868*
	*-0.021**	*-0.0241**	*-0.0200**	*0.0085***	*0.0183**	*0.0165**	*0.0217**
Age Sq.		-0.000615	-0.00249*	-0.0054*	-0.0085*	-0.0101*	-0.0122*
	*0.0003**	*0.0003**	*0.0002**	*-0.0001****	*-0.0003**	*-0.0002**	*-0.0003**
Punjab		0.338**	-0.178	-0.406*	-0.760*	-1.158*	-1.637*
	0.0153	*0.0688**	*0.0205*	*0.0021*	*-0.0180*	*-0.0270**	*-0.0618**
Sindh		-0.0584	-0.661*	-0.178	-0.0404	-0.273	-1.063*
	*0.0309**	*0.0216****	*-0.0762**	*0.0277****	*0.0386**	*0.0127*	*-0.0553**
Balochistan		0.497*	-0.335***	0.533*	0.439**	0.438***	-0.147
	*-0.02****	*0.0394**	*-0.0992**	*0.0720**	*0.0244*	*0.0202*	*-0.0367**
Constant	*0.14**	*0.15**	*0.22**	*0.22**	*0.11**	*0.08**	*0.08**

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.BMTC_M= mother with below matric, A.MTC_M = mother with matric and above matric

Table B15: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Educational Mobility (Including Mothers' Education) -Rural

LR $\chi^2(102) = 6677$ Prob.>$\chi^2 = 0.000$			Pseudo $R^2 = 0.1405$ Log likelihood = -20424			N=14443	
	NAS_S	PMY_S	MDL_S	MTC_S	INT_S	GRD_S	PGR_S
PMY_F		0.850*	1.120*	1.273*	1.376*	1.229*	1.784*
	*-0.179**	*0.0273**	*0.0564**	*0.0599*	*0.0230**	*0.0036**	*0.0088*
MDL_F		0.661*	1.238*	1.533*	1.713*	1.848*	1.815*
	*-0.185**	*-0.0310***	*0.0648**	*0.0922*	*0.0384**	*0.0146**	*0.0064**
MTC_F		0.799*	1.533*	2.217*	2.563*	2.744*	3.154*
	*-0.235**	*-0.0722**	*0.0368**	*0.1491*	*0.0725**	*0.0264**	*0.0221**
INT_F		0.766**	1.394*	2.307*	2.707*	3.251*	3.656*
	*-0.237**	*-0.0819**	*0.0005*	*0.1572*	*0.0802**	*0.0462**	*0.0352**
GRD_F		0.84***	1.252**	2.227*	3.101*	3.671*	4.214*
	*-0.243**	*-0.0778***	*-0.0336*	*0.1134*	*0.1204**	*0.0655**	*0.0549**
PGR_F		0.246	0.94***	1.738*	2.935*	3.407*	4.529*
	*-0.201**	*-0.1205**	*-0.0364*	*0.0654*	*0.1354****	*0.0622**	*0.0955**
Income		0.025***	0.028***	0.0511*	0.0619*	0.0461**	0.0631*
	*-0.005***	*0.0006*	*0.000002**	*0.0030***	*0.0015***	*0.0001****	*0.0003****
Wealth		0.0258*	0.0525*	0.0686*	0.0806*	0.0959*	0.114*
	*-0.01**	*-0.0017**	*0.0030**	*0.0046**	*0.0022**	*0.0011**	*0.0010**
H. Size		0.00434	-0.0112	-0.0343*	-0.0505*	-0.0123	-0.0310
	0.0018	*0.0029***	*0.0002*	*-0.0030**	*-0.0019**	*0.0002*	*-0.0001*
BMTC_M		0.462*	0.781*	0.914*	0.944*	1.139*	1.040*
	*0.115**	*0.0011*	*0.0412**	*0.0453**	*0.0150***	*0.0085*	*0.0037*
A. MTC_M		-0.741	0.337	0.642	1.035**	1.511**	1.533**
	0.009	*-0.1792****	*0.0355*	*0.0596****	*0.0383**	*0.0221**	*0.0148**
Age		0.0174	0.138*	0.249*	0.333*	0.728*	0.952*
	*-0.022**	*-0.0179**	*0.0004*	*0.0115**	*0.0067**	*0.0102**	*0.0107**
Age Sq.		-0.000470	-0.00245*	-0.00377*	_0.00497*	-0.0109*	-0.0142*
	*0.0004**	*0.0003**	*-0.0001*	*-0.0002**	*-0.0001**	*-0.0002**	*-0.0002**
Punjab		0.204*	-0.101	-0.927*	-1.202*	-1.221*	-2.222*
	*0.033**	*0.0814**	*0.0438**	*-0.0859**	*-0.0365**	*-0.0110**	*-0.0248**
Sindh		-0.0695	-1.060*	-0.784*	-0.115	-0.113	-0.710*
	*0.081**	*0.0511**	*-0.1046**	*-0.0632**	*0.0304**	*0.0117***	*-0.0068*
Baloch		0.175**	-0.650*	-0.397*	-0.730*	-0.545*	-1.273*
	*0.042**	*0.0781**	*-0.0681**	*-0.0119*	*-0.0210**	*-0.0017*	*-0.0170**
Constant	*0.31**	*0.23**	*0.20**	*0.16**	*0.06**	*0.023**	*0.018**

Note: * p<0.01, ** p<0.05,** * p<0.1 Roman Numbers are log odd ratios and Bold Italics are Marginal effects. Standard errors are omitted in order to save the space.BMTC_M= mother with below matric, A.MTC_M = mother with matric and above matric

Appendix-C

C1: Occupational Mobility - Conditional Probabilities (KP)

	Occupations of Sons								
	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
Overall									
ELT_F	59.01*	7.38*	15.27*	5.32*	7.72*	1.03	1.72	1.2*	1.37
PMO_F	20.35*	29.87*	21.21*	5.63*	11.26*	2.6	2.6	0.87	5.63
CRW_F	16.73*	6.05*	56.94*	3.2*	9.96*	1.42**	1.42**	0.36	3.91
AFW_F	28.57*	7.52*	9.3*	34.83*	6.09*	2.28	3.8	1.61*	6
SSW_F	18.99*	9.69*	13.57*	8.14*	38.76*	2.33	4.26	1.94**	2.33
CLK_F	15.52*	5.17***	22.41*	8.62**	17.24*	6.9**	6.9**	6.9**	10.34
TAP_F	23*	10*	6*	8*	9*	8	20	7*	9
PRF_F	21.95*	2.44	2.44	9.76**	9.76**	4.88$	9.76**	12.2**	26.83
MGR_F	12.73*	7.1*	8.77*	5.43*	6.68*	2.92	4.59	1.46*	50.31
Urban									
ELT_F	42.67*	9.33*	28.67*	1.33	10.67*	2.67**	2***	1.33	1.33
PMO_F	13.64*	28.41*	26.14*	1.14	14.77*	3.41***	1.14	2.27	9.09*
CRW_F	9.65*	8.77*	64.91*	0.00	7.89*	3.51**	0.88	0.88	3.51**
AFW_F	11.39*	3.8***	27.85*	22.78*	12.66*	3.8***	7.59*	0.00	10.13*
SSW_F	14*	9*	23*	2*	44*	3***	2	0.00	3***
CLK_F	14.29	0.00	32.14**	0.00	10.71	10.71	3.57	7.14	21.43***
TAP_F	20.38*	13.79**	10.34***	0.00	13.79**	10.34*	21.00*	3.45	6.9
PRF_F	12.5	0.00	6.25	0.00	6.25	6.25	18.75	12.5	37.5
MGR_F	9.72*	5.09*	9.72*	1.85**	7.41*	4.17*	3.24*	0.93	57.87*
Rural									
ELT_F	64.67*	6.7*	10.62*	6.7*	6.7	0.46	1.62*	1.15**	1.39
PMO_F	24.48*	30.77*	18.18*	8.39*	9.09	2.1***	3.5**	0.00	3.5**
CRW_F	21.56*	4.19*	51.5*	5.39*	11.38	0.00	1.8***	0.00	4.19
AFW_F	29.8*	7.79*	7.97*	35.69*	5.62	2.17	3.53*	1.72	5.71
SSW_F	22.15*	10.13*	7.59*	12.03*	35.44	1.9***	5.7*	3.16**	1.9***
CLK_F	16.67*	10***	13.33**	16.67*	23.33	3.33	10***	6.67	0.00
TAP_F	23.94*	8.45*	4.23***	11.27*	7.04	7.04**	19.72*	8.45	9.86
PRF_F	28*	4	0.00	16**	12***	4	4	12***	20
MGR_F	15.21*	8.75*	7.98*	8.37*	6.08	1.9**	5.7*	1.9**	44.11*

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers, _F= father, _S=Son.

Table C2: Occupational Mobility - Conditional Probabilities (Punjab)

	Occupation of Sons								
	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
Overall									
ELT_F	57.7*	6.2*	14.04*	6.81*	9.58*	0.85*	0.8*	0.56*	3.47*
PMO_F	17.09*	32*	16.36*	8.18*	13.09*	3.82*	2.73*	1.09*	5.64*
CRW_F	14.88*	3.3*	54.33*	3.48*	12.05*	1.69*	2.17*	0.85*	7.25*
AFW_F	17.97*	5.17*	7.37*	55.72*	4.41*	0.99*	2.17*	1.18*	5.02*
SSW_F	15.82*	7.31*	15.03*	5.05*	46.94*	3.06*	2.13*	1.33*	3.32*
CLK_F	15.24*	6.71*	13.41*	10.98*	15.85*	11.59*	5.49*	6.1*	14.63*
TAP_F	12.16*	5.47*	14.59*	10.64*	13.07*	4.26*	23.71*	3.04*	13.07*
PRF_F	6.5*	4.88*	19.51*	11.38*	13.01*	4.88*	10.57*	18.7*	10.57*
MGR_F	9.07*	4.71*	9.14*	5.62*	11.74*	2.88*	2.81*	2.53*	51.51*
Urban									
ELT_F	50.4*	8.19*	19.45*	0.68*	14.11*	1.48*	1.02*	0.8*	3.87*
PMO_F	17.02*	34.04*	17.63**	1.52*	15.2*	4.56*	3.04*	0.91***	6.08*
CRW_F	9.65*	3.68*	57.43*	1.53*	13.94*	2.14*	2.6*	1.07*	7.96*
AFW_F	15.65*	4.08*	13.61*	39.46*	8.5*	1.36**	2.72*	3.4*	11.22*
SSW_F	15.73*	7.97*	14.44	0.22*	49.35*	3.88*	2.16*	2.16*	4.09*
CLK_F	13.89*	9.26*	10.19	0.93*	17.59*	16.67*	7.41*	8.33*	15.74*
TAP_F	9.45*	4.48*	15.42**	1.99*	15.92*	6.47*	26.37*	3.48*	16.42*
PRF_F	5.26**	6.58**	22.37**	6.58*	15.79*	3.95***	10.53*	21.05*	7.89*
MGR_F	5.26*	4.1*	8.62*	0.84*	12.2*	3.36*	3.26*	3.26*	59.1*
Rural									
ELT_F	62.83*	4.8*	10.23*	11.11*	6.39*	0.4**	0.64*	0.4**	3.2*
PMO_F	17.19*	28.96*	14.48*	18.1*	9.95*	2.71*	2.26*	1.36***	4.98*
CRW_F	23.23*	2.69*	49.39*	6.6*	9.05*	0.98**	1.47*	0.49*	6.11*
AFW_F	18.17*	5.26*	6.85*	57.07*	4.07*	0.96*	2.12*	0.99*	4.5*
SSW_F	15.97*	6.25*	15.97*	12.85*	43.06*	1.74**	2.08*	0.00	2.08*
CLK_F	17.86*	1.79	19.64*	30.36*	12.5*	1.79	1.79*	1.79	12.5*
TAP_F	16.41*	7.03*	13.28*	24.22*	8.59*	0.78*	19.53*	2.34***	7.81*
PRF_F	8.51**	2.13	14.89*	19.15*	8.51**	6.38*	10.64*	14.89*	14.89*
MGR_F	16.74*	5.93*	10.17*	15.25*	10.81*	1.91*	1.91*	1.06**	36.23*

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers, _F= father, _S=Son.

Table C3: Occupational Mobility - Conditional Probabilities (Sindh)

	Occupation of Sons								
	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
Overall									
ELT_F	65.45*	4.75*	9.35*	7.84*	8.16*	1.19*	1.03*	0.08	2.14*
PMO_F	34.19*	20.77*	17.25*	10.22*	8.31*	2.88*	0.64	1.28**	4.47*
CRW_F	14.9*	5.18*	52.48*	3.24*	12.74*	2.59*	4.1*	1.51*	3.24*
AFW_F	21.05*	3.07*	1.52*	65.41*	3.85*	0.71*	1.42*	0.61*	2.36*
SSW_F	21.74*	4.35*	11.01*	10.14*	38.55*	6.38*	2.9*	2.32*	2.61*
CLK_F	17.76*	2.8***	12.15*	3.74**	22.43*	11.21*	14.02*	4.67**	11.21*
TAP_F	20.00*	5.5*	10*	9.5*	16*	6.5*	19.5*	5*	8*
PRF_F	11.25*	3.13**	3.75*	16.25*	9.38*	12.5*	8.13*	22.5*	13.13*
MGR_F	12.57*	2.28*	4.43*	3.95*	9.34*	2.63*	2.99*	2.75*	59.04*
Urban									
ELT_F	57*	6.23*	17.7*	1.17*	11.87*	1.75*	1.36*	0.19	2.72*
PMO_F	31.15*	20.22*	25.68*	1.64***	8.74*	4.37*	1.09*	2.19**	4.92*
CRW_F	13.71*	5.38*	56.45*	0.27	13.44*	2.69*	4.03*	1.08**	2.96*
AFW_F	22.34*	5.85*	2.66**	40.96*	12.23*	2.13**	2.13**	2.66**	9.04*
SSW_F	21.52*	3.38*	15.19*	1.27*	41.35*	8.44*	3.38*	2.11**	3.38*
CLK_F	11.96*	2.17	14.13*	2.17	22.83*	13.04*	15.22*	5.43**	13.04*
TAP_F	17.36*	5.56*	12.5*	1.39	18.75*	8.33*	22.22*	4.17*	9.72*
PRF_F	4.76**	4.76**	5.95**	0.00	15.48*	17.86*	10.71*	25*	15.48*
MGR_F	9.53*	1.13*	5.49*	1.29*	9.53*	2.58*	3.72*	3.07*	63.65*
Rural									
ELT_F	71.26*	3.74*	3.61*	12.43*	5.61*	0.8*	0.8	0.00	1.74
PMO_F	38.46*	21.54	5.38	22.31*	7.69	0.77	0.00	0.00	3.85
CRW_F	19.78*	4.4**	36.26*	15.38*	9.89*	2.2	4.4**	3.3***	4.4**
AFW_F	20.96*	2.89*	1.44*	67.06*	3.28*	0.61*	1.37*	0.47*	1.91*
SSW_F	22.22*	6.48*	1.85	29.63*	32.41*	1.85	1.85	2.78***	0.93
CLK_F	53.33	6.67	0.00	13.33	20**	0.00	6.67	0.00	0.00
TAP_F	26.79*	5.36***	3.57	30.36*	8.93**	1.79	12.5*	7.14**	3.57
PRF_F	18.42*	1.32	1.32	34.21*	2.63	6.58*	5.26**	19.74*	10.53*
MGR_F	21.3*	5.56*	1.39***	11.57*	8.8*	2.78*	0.93	1.85**	45.83*

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers, _F= father, _S=Son.

Table C4: Occupational Mobility - Conditional Probabilities (Balochistan)

	Occupation of Sons								
	ELT_S	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
Overall									
ELT_F	71.72*	3.91*	2.37*	7.57*	7.1*	1.42*	2.84*	0.12	2.96*
PMO_F	27.66*	25.96*	3.83*	7.23*	12.34*	8.09*	5.96*	0.43	8.51*
CRW_F	26.28*	2.56**	54.49*	1.92***	8.97**	3.21**	0.64	0.64	1.28
AFW_F	9.51*	1.81*	0.87*	81.62*	2.19*	0.6*	1.47*	0.08	1.85*
SSW_F	16.59*	6.99*	6.11*	2.62*	58.08*	2.62*	3.06*	0.44	3.49*
CLK_F	16.36*	3.64	5.45***	5.45*	21.82*	23.64*	7.27**	7.27**	9.09**
TAP_F	20*	3.48**	6.09*	6.09*	6.96*	7.83*	34.78*	1.74	13.04*
PRF_F	17.54*	5.26***	3.51	19.3***	12.28***	5.26***	5.26***	14.04*	17.54*
MGR_F	10.74*	4.12*	3.38*	3.09*	8.09*	4.26*	3.53*	1.91*	60.88*
Urban									
ELT_F	60.77*	4.62*	4.62*	0.00	14.62*	0.77*	10.77*	0.00	3.85**
PMO_F	28.36*	19.4*	5.97**	1.49	13.43*	7.46**	4.48***	1.49	17.91*
CRW_F	24.24*	0.00	57.58*	0.00	9.09***	6.06	0.00	0.00	3.03
AFW_F	8.13*	0.81	4.88*	64.23*	4.88*	4.07**	4.07**	0.00	8.94*
SSW_F	12.2*	7.32*	7.32*	0.00	65.85*	2.44$	1.22	1.22	2.44
CLK_F	16.13*	0.00	6.45	0.00	16.13**	29.03*	12.9**	12.9**	6.45
TAP_F	9.68**	0.00	12.9**	0.00	6.45	9.68***	41.94*	0.00	19.35*
PRF_F	20**	0.00	5	0.00	25*	5	0.00	25*	20**
MGR_F	7.3*	1.46**	5.11*	0.36	11.68*	6.2*	5.47*	2.55*	59.85*
Rural									
ELT_F	73.71*	3.78*	1.96*	8.95*	5.73*	1.54*	1.4*	0.14	2.8*
PMO_F	27.38*	28.57*	2.98**	9.52*	11.9*	8.33*	6.55*	0.00	4.76*
CRW_F	26.83*	3.25**	53.66*	2.44***	8.94*	2.44***	0.81	0.81	0.81
AFW_F	9.58*	1.86*	0.67*	82.46*	2.06*	0.44*	1.35*	0.08	1.5*
SSW_F	19.05	6.8	5.44	4.08	53.74*	2.72	4.08	0.00	4.08
CLK_F	16.67**	8.33	4.17	12.5***	29.17*	16.67**	0.00	0.00	12.5***
TAP_F	23.81*	4.76**	3.57***	8.33*	7.14*	7.14*	32.14*	2.38	10.71*
PRF_F	16.22*	8.11***	2.7	29.73*	5.41	5.41	8.11***	8.11***	16.22*
MGR_F	13.05*	5.91*	2.22*	4.93*	5.67*	2.96*	2.22*	1.48*	61.58*

Note: ELT = Elementary Occupations PMO= Plant and Machine Operators and Assemblers CRW= Craft and Related Trades Workers AFW= Skilled Agricultural and Fishery Workers SSW =Service Workers and Shop and Market Sales Workers CLK= Clerk TAP= Technicians and Associate Professionals PRF = Professionals MGR = Managers, _F= father, _S=Son.

Table C5: Ordered Logit Regression: Occupational Mobility

Pseudo R^2=0.1130
LR $\chi^2(22)$ = 10498.06
Prob.>χ^2= 0.0000

PMO_F	0.908*
CRW_F	1.023*
AFW_F	1.784*
SSW_F	2.004*
CLK_F	1.905*
TAP_F	2.084*
PRF_F	1.955*
MGR_F	3.643*
Income	0.025*
Wealth	0.018*
H. Size	-0.002
PMY_S	0.094*
MDL_S	0.162*
MTC_S	0.537*
INT_S	1.000*
GRD_S	1.555*
PGR_S	1.755*
Age	-0.001
Rural	-0.158*
Punjab	0.170*
Sindh	0.209*
Balochistan	0.628*
Constant cut1	1.192*
Constant cut2	1.552*
Constant cut3	2.162*
Constant cut4	3.814*
Constant cut5	4.629*
Constant cut6	4.852*
Constant cut7	5.204*
Constant cut8	5.392*

Brant test of parallel regression assumption

	χ^2	Prob. >χ^2	d.f.
All	15834.93	0.0000	154
PMO_F	259.63	0.0000	7
CRW_F	604.4	0.0000	7
AFW_F	2861.58	0.0000	7
SSW_F	273.43	0.0000	7
CLK_F	22.57	0.002	7
TAP_F	98.83	0.0000	7
PRF_F	44.21	0.0000	7
MGR_F	214.93	0.0000	7
Income	172	0.0000	7
Wealth	240.88	0.0000	7
H. Size	47.34	0.0000	7
PMY_S	89.19	0.0000	7
MDL_S	134.76	0.0000	7
MTC_S	285.91	0.0000	7
INT_S	372.91	0.0000	7
GRD_S	433.32	0.0000	7
PGR_S	551.8	0.0000	7
Age	231.03	0.0000	7
Rural	404.2	0.0000	7
Punjab	144.71	0.0000	7
Sindh	352.37	0.0000	7
Baloch	358.21	0.0000	7

Table C6: Multinomial Logit Regression (Odd Ratios): Occupational Mobility (Pakistan-Overall)

LR $\chi^2(168) = 27836.77$ Prob.>$\chi^2 = 0.0000$					N = 25241 Pseudo $R^2 = 0.2995$			
	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	2.275*	0.868*	1.018*	0.857*	1.585*	1.066*	1.233*	1.145*
	(0.103)	(0.106)	(0.129)	(0.116)	(0.220)	(0.226)	(0.384)	(0.159)
CRW_F	0.693*	2.499*	0.514*	1.257*	1.249*	1.304*	1.187*	1.424*
	(0.143)	(0.0838)	(0.152)	(0.105)	(0.236)	(0.212)	(0.358)	(0.148)
AFW_F	0.793*	0.455*	3.154*	0.509*	0.770*	1.169*	0.968*	1.349*
	(0.0888)	(0.0765)	(0.0654)	(0.0809)	(0.191)	(0.158)	(0.273)	(0.110)
SSW_F	1.114*	0.932*	1.109*	2.530*	1.756*	1.331*	1.650*	0.771*
	(0.132)	(0.108)	(0.133)	(0.0914)	(0.218)	(0.216)	(0.334)	(0.183)
CLK_F	0.556**	0.674*	1.286*	1.190*	1.867*	1.484*	2.017*	1.556*
	(0.275)	(0.202)	(0.238)	(0.190)	(0.268)	(0.274)	(0.369)	(0.223)
TAP_F	0.806*	0.668*	1.316*	1.044*	1.715*	2.980*	1.905*	1.696*
	(0.193)	(0.157)	(0.167)	(0.154)	(0.247)	(0.191)	(0.335)	(0.175)
PRF_F	0.653**	0.575**	1.666*	0.789*	1.092*	1.102*	2.105*	1.500*
	(0.314)	(0.246)	(0.222)	(0.235)	(0.307)	(0.291)	(0.340)	(0.239)
MGR_F	1.064*	0.721*	1.091*	1.336*	1.648*	1.570*	1.888*	3.832*
	(0.121)	(0.102)	(0.114)	(0.0975)	(0.197)	(0.179)	(0.281)	(0.110)
Income	0.127*	0.177*	0.306*	0.142*	0.171*	0.208*	0.294*	0.286*
	(0.0241)	(0.0197)	(0.0167)	(0.0209)	(0.0271)	(0.0227)	(0.0172)	(0.0168)
Wealth	0.0406*	0.0443*	0.0136*	0.0300*	0.0425*	0.0402*	0.0240*	0.0479*
	(0.0036)	(0.0031)	(0.0023)	(0.0031)	(0.0061)	(0.0051)	(0.0071)	(0.0033)
PMY_S	0.304*	0.542*	-0.0305	0.386*	0.744	0.510**	0.658	0.500*
	(0.0862)	(0.0747)	(0.0543)	(0.0801)	(0.510)	(0.221)	(0.519)	(0.0966)
MDL_S	0.301*	0.505*	-0.0846	0.448*	2.142*	0.618*	0.727	0.630*
	(0.0893)	(0.0772)	(0.0624)	(0.0828)	(0.439)	(0.219)	(0.507)	(0.0969)
MTC_S	0.0442	0.437*	-0.0567	0.869*	3.383*	1.967*	1.997*	0.893*
	(0.103)	(0.0873)	(0.0703)	(0.0872)	(0.425)	(0.195)	(0.454)	(0.101)
INT_S	-0.00760	0.266**	0.00653	1.331*	4.579*	2.919*	3.390*	1.248*
	(0.160)	(0.133)	(0.109)	(0.119)	(0.432)	(0.212)	(0.454)	(0.132)
GRD_S	0.316	0.515**	0.381***	1.839*	6.107*	4.294*	5.274*	1.836*
	(0.287)	(0.244)	(0.212)	(0.211)	(0.460)	(0.264)	(0.473)	(0.216)
PGR_S	-0.928	0.298	0.244	1.654*	6.389*	4.727*	6.860*	2.133*
	(0.638)	(0.367)	(0.333)	(0.314)	(0.507)	(0.336)	(0.507)	(0.299)
Age	0.0491*	-0.00224	-0.0263*	0.00266	0.0253*	0.0448*	0.0616*	0.0179*
	(0.0053)	(0.0049)	(0.0039)	(0.00504)	(0.0094)	(0.00754)	(0.0113)	(0.0052)
Rural	0.0308	-0.488*	1.185*	-0.448*	-0.156	0.1000	0.280***	-0.241*
	(0.0770)	(0.0629)	(0.0742)	(0.0652)	(0.126)	(0.110)	(0.165)	(0.0716)
Punjab	-0.151***	-0.111	0.665*	0.246*	0.103	-0.00165	0.358***	0.0490
	(0.0852)	(0.0722)	(0.0707)	(0.0809)	(0.155)	(0.129)	(0.190)	(0.0879)
Sindh	-0.440*	-0.589*	0.845*	-0.0725	-0.143	-0.301**	-0.0773	-0.0813
	(0.0985)	(0.0835)	(0.0733)	(0.0891)	(0.165)	(0.142)	(0.202)	(0.0965)
Baloch	-0.144	-0.685*	1.338*	0.437*	1.204*	0.975*	0.468***	0.660*
	(0.110)	(0.105)	(0.0777)	(0.0977)	(0.173)	(0.146)	(0.253)	(0.102)
Constant	-4.844*	-3.039*	-4.077*	-3.405*	-8.914*	-7.739*	-9.726*	-5.833*
	(0.197)	(0.168)	(0.151)	(0.176)	(0.529)	(0.331)	(0.597)	(0.207)

Table C7: Multinomial Logit Regression (Odd Ratios): Occupational Mobility (Urban)

LR $\chi^2(160) = 8406.09$ Prob.>$\chi^2 = 0.0000$				N = 7999 Pseudo $R^2 = 0.2691$				
	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	2.143*	0.720*	1.333*	0.627*	1.532*	0.608***	1.496*	1.270*
	(0.152)	(0.141)	(0.426)	(0.159)	(0.305)	(0.332)	(0.493)	(0.221)
CRW_F	0.888*	2.443*	1.543*	1.283*	1.576*	1.415*	1.404*	1.630*
	(0.191)	(0.119)	(0.417)	(0.144)	(0.305)	(0.278)	(0.475)	(0.209)
AFW_F	0.477**	0.612*	5.051*	0.736*	0.962*	1.151*	1.485*	1.943*
	(0.242)	(0.171)	(0.296)	(0.181)	(0.359)	(0.311)	(0.469)	(0.217)
SSW_F	0.904*	0.740*	0.831*	2.277*	2.008*	0.974*	1.769*	0.879*
	(0.184)	(0.140)	(0.497)	(0.125)	(0.287)	(0.306)	(0.451)	(0.244)
CLK_F	0.661*	0.707*	1.391**	1.216*	2.404*	1.799*	2.591*	1.975*
	(0.355)	(0.255)	(0.664)	(0.244)	(0.341)	(0.339)	(0.472)	(0.285)
TAP_F	0.760*	0.822*	1.759*	1.272*	2.227*	3.120*	1.982*	2.085*
	(0.282)	(0.209)	(0.513)	(0.207)	(0.332)	(0.270)	(0.481)	(0.248)
PRF_F	1.243*	1.090*	2.534*	1.406*	1.962*	1.618*	2.802*	1.929*
	(0.452)	(0.354)	(0.600)	(0.344)	(0.444)	(0.429)	(0.503)	(0.376)
MGR_F	0.884*	0.756*	1.895*	1.458*	2.084*	1.750*	2.313*	4.166*
	(0.187)	(0.139)	(0.362)	(0.137)	(0.270)	(0.246)	(0.393)	(0.169)
Income	0.0503	0.0665*	0.126*	0.0345	-0.0218	0.0535*	0.113*	0.113*
	(0.0321)	(0.0242)	(0.0239)	(0.0265)	(0.0379)	(0.0297)	(0.0239)	(0.0234)
Wealth	0.0252*	0.0365*	0.0220*	0.0280*	0.0316*	0.0521*	0.0393*	0.0602*
	(0.007)	(0.005)	(0.008)	(0.005)	(0.0095)	(0.0089)	(0.011)	(0.0058)
PMY_S	0.321**	0.443*	-0.496**	0.474*	0.906	0.557	-1.212	0.509*
	(0.152)	(0.120)	(0.220)	(0.133)	(0.841)	(0.370)	(1.159)	(0.167)
MDL_S	0.0620	0.502*	-0.288	0.580*	1.913**	0.510	-0.232	0.507*
	(0.153)	(0.118)	(0.216)	(0.130)	(0.752)	(0.356)	(0.772)	(0.160)
MTC_S	-0.207	0.408*	-0.347	0.926*	3.338*	1.459*	1.426**	0.843*
	(0.176)	(0.131)	(0.226)	(0.138)	(0.729)	(0.336)	(0.641)	(0.166)
INT_S	-0.249	0.302	-0.310	1.247*	4.606*	2.493*	2.599*	1.211*
	(0.251)	(0.184)	(0.302)	(0.180)	(0.735)	(0.352)	(0.643)	(0.202)
GRD_S	0.261	0.514	0.709	1.984*	6.505*	4.058*	4.441*	2.031*
	(0.435)	(0.347)	(0.452)	(0.313)	(0.772)	(0.427)	(0.680)	(0.324)
PGR_S	-1.069	0.171	-0.230	1.512*	6.416*	4.113*	5.810*	1.863*
	(0.790)	(0.431)	(0.583)	(0.385)	(0.798)	(0.471)	(0.692)	(0.375)
Age	0.0491*	-0.0109	-0.0158	-0.008	0.0183	0.0155	0.0311*	0.0179**
	(0.0094)	(0.0078)	(0.013)	(0.0081)	(0.014)	(0.0126)	(0.017)	(0.0084)
Punjab	-0.228	-0.493*	0.280	0.137	-0.0373	-0.0602	0.766**	-0.136
	(0.166)	(0.129)	(0.260)	(0.146)	(0.245)	(0.244)	(0.362)	(0.156)
Sindh	-0.787*	-0.781*	0.0553	-0.300**	-0.567**	-0.476*	0.0775	-0.440*
	(0.181)	(0.136)	(0.271)	(0.152)	(0.249)	(0.250)	(0.367)	(0.162)
Baloch	-0.956*	-1.141*	0.767*	0.149	0.616**	0.838*	0.927**	0.194
	(0.256)	(0.196)	(0.298)	(0.185)	(0.292)	(0.284)	(0.440)	(0.194)
Constant	-3.729*	-1.995*	-4.778*	-2.825*	-7.961*	-6.832*	-8.985*	-6.026*
	(0.343)	(0.260)	(0.514)	(0.280)	(0.855)	(0.544)	(0.875)	(0.338)

Table C8: Multinomial Logit Regression (Odd Ratios): Occupational Mobility (Rural)

LR $\chi^2(160) = 14150.15$ Prob.>$\chi^2 = 0.0000$					N = 17242 Pseudo $R^2 = 0.2536$			
	PMO_S	CRW_S	AFW_S	SSW_S	CLK_S	TAP_S	PRF_S	MGR_S
PMO_F	2.422*	1.034*	1.114*	1.130*	1.712*	1.506*	0.555	1.025*
	(0.142)	(0.165)	(0.144)	(0.169)	(0.321)	(0.310)	(0.694)	(0.236)
CRW_F	0.409***	2.632*	0.398**	1.254*	0.856**	1.131*	0.918	1.271*
	(0.230)	(0.121)	(0.172)	(0.160)	(0.415)	(0.346)	(0.572)	(0.218)
AFW_F	0.924*	0.550*	2.981*	0.544*	0.662*	1.203*	0.659*	1.201*
	(0.106)	(0.096)	(0.068)	(0.099)	(0.248)	(0.208)	(0.359)	(0.133)
SSW_F	1.318*	1.158*	1.313*	2.839*	1.312*	1.673*	1.457*	0.638**
	(0.190)	(0.170)	(0.152)	(0.133)	(0.364)	(0.304)	(0.515)	(0.292)
CLK_F	0.519	0.792**	1.385*	1.412*	0.974*	0.775	0.927	1.103*
	(0.440)	(0.334)	(0.290)	(0.302)	(0.533)	(0.552)	(0.768)	(0.398)
TAP_F	0.904*	0.549**	1.221*	0.833*	1.231*	2.908*	1.960*	1.406*
	(0.265)	(0.252)	(0.192)	(0.245)	(0.390)	(0.273)	(0.467)	(0.260)
PRF_F	0.206	0.147	1.408*	0.130	0.421	0.76***	1.611*	1.492*
	(0.466)	(0.400)	(0.256)	(0.378)	(0.451)	(0.418)	(0.480)	(0.313)
MGR_F	1.297*	0.816*	1.018*	1.274*	1.408*	1.422*	1.315*	3.642*
	(0.158)	(0.154)	(0.128)	(0.145)	(0.298)	(0.271)	(0.434)	(0.144)
Income	0.164*	0.220*	0.410*	0.166*	0.315*	0.281*	0.413*	0.327*
	(0.0323)	(0.0284)	(0.0213)	(0.0314)	(0.0349)	(0.0337)	(0.0230)	(0.0247)
Wealth	0.0483*	0.0476*	0.0121*	0.0336*	0.0560*	0.0350*	0.0121	0.0467*
	(0.0044)	(0.0041)	(0.0025)	(0.0041)	(0.0083)	(0.0064)	(0.010)	(0.0043)
PMY_S	0.285*	0.632*	-0.00731	0.309*	0.609	0.439	1.332**	0.493*
	(0.106)	(0.0984)	(0.0573)	(0.102)	(0.648)	(0.280)	(0.670)	(0.119)
MDL_S	0.437*	0.480*	-0.0593	0.293*	2.297*	0.593**	1.252***	0.763*
	(0.111)	(0.105)	(0.0674)	(0.112)	(0.542)	(0.283)	(0.687)	(0.123)
MTC_S	0.189	0.479*	-0.0353	0.805*	3.399*	2.220*	2.203*	0.956*
	(0.128)	(0.122)	(0.0774)	(0.116)	(0.524)	(0.241)	(0.643)	(0.130)
INT_S	0.190	0.141	0.0599	1.474*	4.567*	3.154*	3.762*	1.232*
	(0.208)	(0.214)	(0.126)	(0.160)	(0.538)	(0.268)	(0.641)	(0.183)
GRD_S	0.434	0.815**	0.255	1.884*	5.656*	4.406*	5.722*	1.508*
	(0.384)	(0.356)	(0.257)	(0.293)	(0.587)	(0.340)	(0.660)	(0.325)
PGR_S	-0.653	0.560	0.685	2.074*	6.550*	5.390*	7.667*	2.572*
	(1.103)	(0.747)	(0.507)	(0.566)	(0.728)	(0.535)	(0.766)	(0.531)
Age	0.0496*	0.00393	-0.0252*	0.0102	0.0289**	0.0646*	0.0863*	0.0138***
	(0.0064)	(0.0065)	(0.0042)	(0.0067)	(0.0136)	(0.0095)	(0.0152)	(0.0071)
Punjab	-0.19***	0.137	0.681*	0.244**	-0.0172	-0.00446	0.0401	0.0745
	(0.102)	(0.0910)	(0.0745)	(0.102)	(0.213)	(0.159)	(0.241)	(0.111)
Sindh	-0.22***	-0.814*	0.941*	0.070	0.147	-0.229	-0.128	0.0769
	(0.122)	(0.129)	(0.0775)	(0.118)	(0.242)	(0.190)	(0.274)	(0.130)
Baloch	0.104	-0.519*	1.363*	0.516*	1.427*	0.986*	-0.137	0.806*
	(0.124)	(0.129)	(0.0816)	(0.119)	(0.220)	(0.176)	(0.356)	(0.123)
Constant	-5.320*	-4.063*	-2.958*	-4.190*	-9.725*	-8.250*	-9.846*	-5.914*
	(0.215)	(0.201)	(0.137)	(0.208)	(0.657)	(0.388)	(0.776)	(0.244)

Table C9: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Occupational Mobility (Pakistan-Overall)

LR $\chi^2(48) = 12526$ Prob.>$\chi^2 = 0.0000$		N = 25241 Pseudo $R^2 = 0.2421$		
	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S
Skill2_F		1.906*	1.393*	1.469*
	*-0.3603**	*0.3561**	*-0.001*	*0.0052*
Skill3 _ F		1.079*	2.912*	1.833*
	*-0.2663**	*0.1012**	*0.1071**	*0.0580**
Skill4 _ F		1.160*	1.650*	3.617*
	*-0.3404**	*-0.0239***	*-0.002*	*0.3664**
Income		0.248*	0.210*	0.260*
	*-0.0366**	*0.0318**	*0.0001*	*0.0049**
Wealth		0.0213*	0.0382*	0.0436*
	*-0.0035**	*0.0014**	*0.0004**	*0.0018**
PMY_S		0.152*	0.548**	0.485*
	*-0.0303**	*0.0031*	*0.0033****	*0.0238**
MDL_S		0.160*	0.698*	0.634*
	*-0.0341**	*-0.0046*	*0.0047***	*0.0341**
MTC_S		0.231*	2.028*	0.889*
	*-0.054**	*-0.0233***	*0.0317**	*0.0452**
INT_S		0.440*	2.922*	1.231*
	*-0.091**	*-0.0294***	*0.0662**	*0.054**
GRD_S		1.102*	4.283*	2.099*
	-0.174	*-0.0286**	*0.1326**	*0.0698**
PGR_S		1.186*	4.782*	3.114*
	*-0.198**	*-0.1282*	*0.1572**	*0.1690**
Age		-0.00373	0.0388*	0.020*
	0.0001	*-0.0023**	*0.0009**	*0.0014**
Rural		-0.0256	0.104	-0.195*
	0.0059	*0.0036*	*0.0043****	*-0.0138**
Punjab		0.302*	0.005	0.115
	*-0.0427**	*0.0543**	*-0.005****	*-0.0066*
Sindh		0.222*	-0.194	-0.0189
	*-0.0295**	*0.0479**	*-0.0076***	*-0.0109***
Baloch		0.637*	0.991*	*0.720**
	*-0.0957**	*0.0685**	*0.0135*	**0.0137****
Constant		-1.879*	-7.703*	-5.702*

Table C10: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Occupational Mobility (Urban-Rural)

	Urban				Rural			
	N = 7999 LR $\chi^2(45)$ = 4540 Prob.>χ^2 = 0.0000 Pseudo R^2 = 0.25				N = 17242 LR $\chi^2(45)$ = 7085 Prob.>χ^2 = 0.0000 Pseudo R^2 = 0.22			
	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S
Skill2_F		1.575*	1.187*	1.620*		2.035*	1.420*	1.237*
	*-0.2753**	*0.2491**	*-0.0044*	*0.0306**	*-0.3945**	*0.3990**	*0.0004*	*-0.0049*
Skill3 _ F		1.093*	2.976*	2.086*		1.036*	2.858*	1.625*
	*-0.2503**	*0.0200*	*0.1466**	*0.0837**	*-0.2612**	*0.1247**	*0.0890**	*0.0475**
Skill4 _ F		1.203*	1.785*	3.946*		1.155*	1.527*	3.390*
	*-0.3169**	*-0.1464**	*-0.0089*	*0.4722**	*-0.3467**	*0.0262****	*0.0002*	*0.3204**
Income		0.0683*	0.0565**	0.0964*		0.335*	0.272*	0.336*
	*-0.0093**	*0.0051***	*-0.0005*	*0.0047**	*-0.0515**	*0.0469**	*-0.0001*	*0.0047**
Wealth		0.0289*	0.0527*	0.0572*		0.0218*	0.0336*	0.0390*
	*-0.0044**	*0.0003*	*0.0006***	*0.0035**	*-0.0036**	*0.0022**	*0.0002***	*0.0012**
PMY_S		0.337*	0.584	0.478*		0.120**	0.472***	0.522*
	*-0.0551**	*0.0278*	*0.0045*	*0.0227*	*-0.0250**	*0.0031*	*0.0022*	*0.0196**
MDL_S		0.368*	0.534	0.487*		0.112***	0.661**	0.778*
	*-0.0587**	*0.034****	*0.0033*	*0.0213*	*-0.0281**	*-0.0097*	*0.0036****	*0.0342**
MTC_S		0.453*	1.452*	0.824*		0.190*	2.291*	0.952*
	*-0.0791**	*0.0097*	*0.0226**	*0.0468**	*-0.0488**	*-0.0239*	*0.0351**	*0.0377**
INT_S		0.660*	2.455*	1.184*		0.402*	3.150*	1.238*
	*-0.1133**	*-0.0060*	*0.0605**	*0.0589**	*-0.0871**	*-0.0242***	*0.0697**	*0.0416**
GRD_S		1.627*	4.018*	2.140*		0.813*	4.375*	2.200*
	*-0.2009**	*0.0249*	*0.1208**	*0.0552**	*-0.1568**	*-0.0664**	*0.1435**	*0.0797**
PGR_S		1.332*	4.089*	2.576*		1.227**	5.363*	3.979*
	*-0.1935**	*-0.0794**	*0.1326**	*0.1403**	*-0.2244**	*-0.2059**	*0.1813**	*0.2490**
Age		0.00258	0.0160	0.0212*		-0.00597	0.0552*	0.0207*
	-0.0008	*-0.0015*	*0.0003*	*0.0020**	*0.0004*	*-0.0026**	*0.0011**	*0.0011**
Punjab		-0.154	-0.155	-0.0951		0.374*	0.0488	0.110
	0.0175	*-0.0201*	*-0.0013*	*0.0039*	*-0.0576**	*0.0690**	*-0.0040*	*-0.0075*
Sindh		-0.529*	-0.498**	-0.446*		0.440*	-0.151	0.0497
	*0.0669**	*-0.0634**	*-0.0020*	*-0.0015*	*-0.0657**	*0.0857**	*-0.0078**	*-0.0123***
Baloch		-0.351**	0.612**	0.123		0.821*	1.035*	0.788*
	*0.028****	*-0.0968**	*0.0355**	*0.033***	*-0.1278**	*0.1099**	*0.0089**	*0.0090*
Constant		-1.501*	-6.793*	-5.823*		-2.183*	-8.155*	-5.811*
	*0.2079**	*0.5181**	*0.0441**	*0.23**	*0.2757**	*0.6235**	*0.0233**	*0.0775**

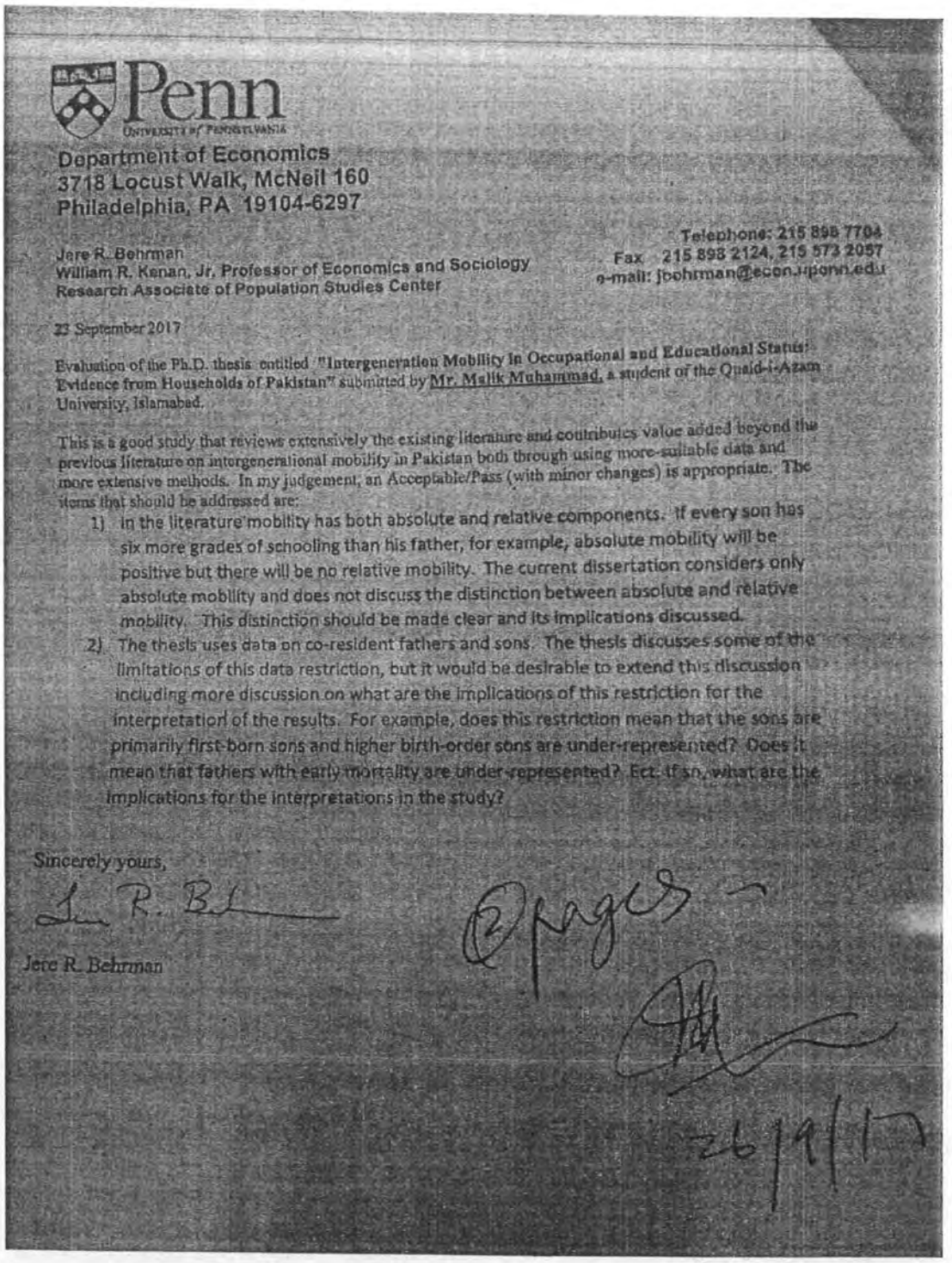
Table C11: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Occupational Mobility (KP-Punjab)

	KP				Punjab			
	N = 3214 LR $\chi^2(39) = 1419.36$ Prob.>$\chi^2 = 0.0000$ Pseudo $R^2 = 0.2027$				N = 10361 LR $\chi^2(39) = 4799.1$ Prob.>$\chi^2 = 0.0000$ Pseudo $R^2 = 0.2274$			
	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S
Skill2_F		1.366*	1.156*	1.629*		1.618*	1.698*	1.310*
	*-0.2749**	*0.2386**	*0.0031*	*0.0332**	*-0.2884**	*0.2766**	*0.008****	*0.0037*
Skill3 _ F		0.585**	2.377*	1.921*		1.167*	3.623*	1.802*
	*-0.1831**	*0.0049*	*0.0932**	*0.0851**	*-0.2566**	*0.0766**	*0.1305**	*0.0495**
Skill4 _ F		0.757*	1.680*	3.644*		1.234*	2.267*	3.414*
	*-0.2861**	*-0.1003**	*0.0069*	*0.3796**	*-0.3041**	*-0.0433**	*0.0104***	*0.3370**
Income		0.179*	0.144**	0.193*		0.261*	0.243*	0.275*
	*-0.0302**	*0.0253**	*-0.0002*	*0.0051**	*-0.0369**	*0.0317**	*0.0002*	*0.0050**
Wealth		0.0410*	0.0235*	0.0483*		0.0288*	0.0361*	0.0447*
	*-0.0069**	*0.0057**	*-0.0004*	*0.0016**	*-0.0043**	*0.0025**	*0.0002*	*0.0017**
PMY_S		0.118	-1.587	0.465***		0.202*	0.482	0.277***
	-0.0249	*0.0064*	*-0.008****	*0.0266*	*-0.0336**	*0.0220*	*0.0037*	*0.0078*
MDL_S		0.0254	0.251	0.787*		0.303*	0.394	0.609*
	-0.0206	*-0.0380*	*0.0013*	*0.0573**	*-0.0515**	*0.0226*	*0.0011*	*0.0278**
MTC_S		-0.139	1.546*	0.783*		0.539*	1.762*	1.029*
	-0.0056	*-0.0893**	*0.0329**	*0.0621**	*-0.0903**	*0.0227*	*0.0242**	*0.0434**
INT_S		0.212	2.813*	1.254*		0.767*	2.679*	1.564*
	*-0.0822**	*-0.085***	*0.0955**	*0.0717**	*-0.1263**	*0.0022*	*0.0527**	*0.0714**
GRD_S		0.507	4.287*	2.245*		1.339*	4.060*	2.397*
	*-0.1696**	*-0.1946**	*0.2433**	*0.1209**	*-0.1898**	*-0.0211*	*0.1162**	*0.0947**
PGR_S		1.326**	4.864*	3.393*		0.646	3.931*	2.793*
	*-0.2385**	*-0.1596**	*0.2067**	*0.1915**	*-0.1577**	*-0.2016*	*0.1344**	*0.2249**
Age		0.00777	0.0424**	0.0254**		-0.00133	0.0385*	0.0259*
	-0.0019	*-0.0005*	*0.001****	*0.0013*	*-0.0003*	*-0.0024**	*0.0008**	*0.0019**
Rural		-0.460*	-0.0788	-0.432**		-0.0177	0.0325	-0.327*
	*0.0722**	*-0.0716**	*0.0093*	*-0.0099*	*0.0069*	*0.0163**	*0.0032**	*-0.0264**
Constant		-1.779*	-6.504*	-5.791*		-1.848*	-7.620*	-5.476*
	*0.2884**	*0.5376**	*0.0392**	*0.1347**	*0.2403**	*0.5988**	*0.0284**	*0.1325**

Table C12: Multinomial Logit Regression (Odd Ratios and Marginal Effects): Occupational Mobility(Sindh-Balochistan)

	Sindh				Balochistan			
	N = 6645 LR $\chi^2(39) = 3476$ Prob.>$\chi^2 = 0.0000$ Pseudo $R^2 = 0.26$				N = 5021 LR $\chi^2(39) = 3318$ Prob. >$\chi^2 = 0.0000$ Pseudo $R^2 = 0.34$			
	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S	Skil1_S	Skill2 _ S	Skill3 _ S	Skill4_ S
Skill2_F		1.885*	1.584*	1.575*		2.847*	1.064*	1.396*
	*-0.3829**	*0.3695**	*0.0037*	*0.0097*	*-0.5008**	*0.5447**	*-0.0284**	*-0.016****
Skill3 _ F		1.178*	2.719*	1.873*		0.846*	2.466*	1.809*
	*-0.2841**	*0.1648**	*0.0743**	*0.0451**	*-0.2601**	*0.0549*	*0.1247**	*0.0805**
Skill4 _ F		1.044*	1.627*	3.836*		1.436*	0.665***	3.918*
	*-0.3399**	*-0.0052*	*-0.0023*	*0.347**	*-0.4367**	*0.0185*	*-0.0331**	*0.4513**
Income		0.157*	0.0982**	0.161*		0.420*	0.338*	0.440*
	*-0.0252**	*0.0232**	*-0.0008*	*0.0029**	*-0.0496**	*0.0417**	*-0.0001*	*0.0080**
Wealth		0.0256*	0.0518*	0.0594*		0.00173	0.0489*	0.0263*
	*-0.0047**	*0.0019**	*0.0005**	*0.0023**	*-0.0008*	*-0.0014**	*0.0010**	*0.0012**
PMY_S		0.0689	1.445**	0.639*		0.281*	0.408	0.676*
	*-0.0232****	*-0.0167*	*0.0077***	*0.0322**	*-0.0413**	*0.0121*	*0.0013*	*0.0279**
MDL_S		0.0603	1.408**	0.736*		0.0290	0.479	0.351
	-0.0236	*-0.0225*	*0.0073***	*0.0388**	*-0.0107*	*-0.0121*	*0.0044*	*0.0184*
MTC_S		0.191*	2.579*	1.031*		0.110	2.101*	0.609*
	*-0.0520**	*-0.0224*	*0.0249**	*0.0495**	*-0.0346***	*-0.035****	*0.0450**	*0.0243****
INT_S		0.241***	3.227*	1.135*		0.915*	3.402*	0.879**
	*-0.0653**	*-0.0312*	*0.0459**	*0.0507**	*-0.118**	*0.028*	*0.092**	*-0.002*
GRD_S		1.162*	4.815*	1.919*		1.545*	3.852*	1.743*
	*-0.1860**	*0.0408*	*0.1003**	*0.0449**	*-0.1643**	*0.0619*	*0.0842**	*0.0181*
PGR_S		1.343*	5.504*	3.267*		15.02	18.03	15.16
	*-0.2189**	*-0.0535*	*0.1300**	*0.1425**	*-0.2487**	*0.0641*	*0.1738**	*0.0109*
Age		-0.00841	0.0352**	0.0206*		-0.0129	0.0473**	-0.00651
	*0.0008**	*-0.0030**	*0.0008***	*0.0014***	*0.00115*	*-0.0024***	*0.0015***	*-0.00012*
Rural		0.295*	0.337	0.236		0.212	0.368	-0.0704
	*-0.0477**	*0.0449**	*0.0024*	*0.0004*	*-0.0221*	*0.0306**	*0.0061*	*-0.0146*
Constant		-1.693*	-8.874*	-6.659*		-1.741*	-7.516*	-4.504*
	0.2832	*0.5713**	*0.0268**	*0.1187**	*0.2225**	*0.6308**	*0.0311**	*0.1157**

Referee Report (Jere R. Behrman)



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23 September 2017

Evaluation of the Ph.D. thesis entitled "Intergeneration Mobility in Occupational and Educational Status: Evidence from Households of Pakistan" submitted by Mr. Malik Muhammad, a student of the Quaid-i-Azam University, Islamabad.

This is a good study that reviews extensively the existing literature and contributes value added beyond the previous literature on intergenerational mobility in Pakistan both through using more-suitable data and more extensive methods. In my judgement, an Acceptable/Pass (with minor changes) is appropriate. The items that should be addressed are:

1) In the literature mobility has both absolute and relative components. If every son has six more grades of schooling than his father, for example, absolute mobility will be positive but there will be no relative mobility. The current dissertation considers only absolute mobility and does not discuss the distinction between absolute and relative mobility. This distinction should be made clear and its implications discussed.
2) The thesis uses data on co-resident fathers and sons. The thesis discusses some of the limitations of this data restriction, but it would be desirable to extend this discussion including more discussion on what are the implications of this restriction for the interpretation of the results. For example, does this restriction mean that the sons are primarily first-born sons and higher birth-order sons are under-represented? Does it mean that fathers with early mortality are under-represented? Ect. If so, what are the implications for the interpretations in the study?

Sincerely yours,

J. R. B.

Jere R. Behrman

2 pages

26/9/17

Referee Report (Peter F. Orazem)

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December 13, 2017

Syed Muhammad Aqil Gillani
Controller of Examinations
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PAKISTAN

Dear Dr. Gillani:

I attach my comments on Malik, Muhammad. "Intergenerational Mobility in Occupational and Educational Status: Evidence from Households of Pakistan" No. CE/Ph. D/2017-354

This dissertation uses the Pakistan Social and Living Standards Measurement Survey to examine the persistence of occupational status and schooling levels between fathers and sons in Pakistan. I have by now reviewed several dissertations from Quaid-i-Azam, and I felt this was the most impressive of all I have reviewed.

The topic of intergenerational transmission of wealth and poverty is very current and of concern in developed and developing countries alike. I was impressed with how broadly Mr. Malik surveyed the existing literature. This is a topic I cover in one of my classes, but his review was more exhaustive than what I have covered. I found that chapter of the dissertation very useful.

The empirical work is based on a Becker-Tomes model of the sort I have advised my students to use. Mr. Malik uses two empirical strategies to measure the transfer of wealth. One is based on the education of the parent and child. The other is based on the occupational level of the parent and child where occupational level is determined by the required skill content of the occupations. I thought both of these strategies were appropriate and yielded interesting results.

The dissertation is very well written. I would expect it to generate several publishable papers and I would expect them to be competitive in international economics journals.

This dissertation clearly meets the standards for our university and I support Mr. Malik's graduation in to the ranks of PhD economists.

Sincerely,

Peter F. Orazem
University Professor of Economics
Iowa State University

15/12/17

Referee Report (Muhammad Jamil)

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Date : *Feb. 23, 2018*

Subject: Evalution Report on the PhD thesis titled "Intergenerational Mobility in Educational and Occupational Status: Evidence from Households of Pakistan" submitted by Malik Muhammad

The PhD thesis of Mr. Malik Muhammad entitled "Intergenerational Mobility in Educational and Occupational Status: Evidence from Households of Pakistan" is completed under my supervision. The thesis is excellent piece of research, which is completed mostly independently. The author try to investigate the mobility of educational and occupational status among the co-resident fathers and sons. The thesis is rare work on the occupational and educational mobility in Pakistan.

The thesis consists of seven well written chapters. Theoretical aspects of mobility in educational and occupational status is very well explained in chapter 2. The author of the thesis presented good review of literature regarding the issues. Further, the models presented in chapter 4 are appropriate. Then the results presented in chapter 6 fill standard requirements of the thesis.

Malik Muhammad used data of PSLM (2012-13) to analyze the persistence and non-persistence of socio-economic status. The author used transition matrices and multinomial logit model to find out the strength of mobility in educational and occupational status. In particular all the contributions are well founded on solid theoretical grounds. The thesis satisfies the conditions of a creative scientific work.

The thesis is brief and focused with no fats. It demonstrates how good thesis can be written within limited space. The external reviewers have given very encouraging comments and noted only a few minor points for which explanation is added in the thesis. The author of the thesis proved his ability to perform research and to achieve scientific results. The paper out of the thesis titled "Intergenerational Mobility in Occupational Status" is published in *Forman Journal of Economic Studies*, Vol. 13 (copy attached). Based on my own assessment and the reviewer's comments, ***I recommend in favor of awarding PhD in Economics degree to Mr. Malik Muhammad.***

Dr. Muhammad Jamil