© *The Pakistan Development Review*
59:2 (2020) pp. 179–198
DOI: 10.30541/v59i2pp.179-198

Intergenerational Mobility in Educational Attainments

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This paper investigates intergenerational educational mobility, a non-monetary measure of socioeconomic status in Pakistan. Data from the Pakistan Social and Living Standards Measurements (PSLM-2012-13) are used for empirical analysis. Contingency tables and multinomial logit model are utilised. Results indicate strong evidence of intergenerational linkages in educational attainments between fathers and their sons. Although findings reveal some degree of upward mobility, opportunities are not equal for all. Chances for attainment of higher education for sons of fathers with education up to the secondary level only, are not as prevalent as for sons of highly educated fathers. Further, urban areas show higher mobility as compared to rural areas. Results also reveal that the affluent are more likely to attain higher levels of education than the financially disadvantaged. In addition, sons of affluent families in rural areas are less likely to attain higher levels of education compared to the sons of the affluent in urban areas. Our findings also support evidence in favour of the child quality-quantity trade-off as shown by negative impacts of family size on attainment of higher levels of education.

JEL Classification: C24, J24, L86, O43, O47
Keywords: Inequality of Opportunity, Education, Intergenerational Mobility

1. INTRODUCTION

Intergenerational mobility in socioeconomic status is the link between the socioeconomic status of parents and their children as adults. If this link is strong, there will be more persistence in society. On the other hand, a society is termed more mobile if the link between the socioeconomic status of parents and their children is weak. Due to various forms of discrimination, some specific social classes are excluded from the capability formation process and income earning opportunities. As a result, both current and future generations of these classes experience backwardness, deprivation, and increase in inequality and poverty.

The poor are excluded from wider participation in income generating activities because of their relatively weak financial position, while exclusion from capability formation opportunities due to low income also renders them poorly endowed in terms of human capital. This reduces the income of their next generation and thus the same status persists across generations. In less mobile societies, human skills and talents are more

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likely to be wasted, and talented members from poor families are likely to remain underdeveloped. Further, lack of equal opportunity may affect the motivation and efforts of individuals reducing the overall efficiency and growth potential of an economy.

Higher intergenerational mobility ensures placement of individuals in a society according to their competence rather than social origin. It increases the optimal utilisation of talented individuals, and enhances productivity and economic growth. Earnings, occupation, and education measure the socioeconomic status of an individual. Economists widely use income as a proxy for socioeconomic status.

Starting from contributions by Becker and Tomes (1979, 1986), and Loury (1981), economists have increasingly paid attention to the issue of inequality in income among families over generations and attempted to estimate intergenerational income mobility, producing diverse results over time and across regions. We find that income suffers from a number of problems. It is influenced by time and cycles. It is also affected by individual and aggregated temporary shocks. Moreover, income significantly varies over a life cycle. Patterns of income observed in a life cycle also vary from generation to generation. Therefore, it becomes quite difficult to find a link between incomes of parents and their children to evaluate the strength of intergenerational mobility on socioeconomic status.

However, education is less likely to be exposed to measurement errors, and unlikely to bias estimation by life cycle bias, as most individuals complete their education by their early or mid-twenties. The level of education reveals information about the life of an individual. Higher levels of education are associated with higher earnings, better health, longer lifespan and other economic outcomes (Solon et al. 1994; Blanden, 2009; Black & Devereux, 2011). Education increases the probability of upward occupational and income mobility. It produces mobility aspirations, socialises an individual for better work role and position. Therefore, it is a reasonable proxy to measure the overall socioeconomic status of individuals. Mobility of education, therefore, would mean mobility in overall socioeconomic status.

There is ample research on intergenerational mobility at the international level but Pakistan lacks similar in-depth study in this area. Social exclusion, income inequality, poverty, and low economic growth are quite prevalent in Pakistan. So far, researchers have focused on a particular "outcome" variable (e.g. earning, consumption, expenditure, or wealth) and determined how inequality in this variable has changed over time. However, in the context of Pakistan, no researcher has focused comprehensively on intergenerational mobility, addressing the extent to which the outcomes for the present generation influences the previous generations' characteristics.

In this paper, we try to fill the void in existing literature by exploring not only the level of educational attainment in Pakistan but also the degree of educational mobility. We also extend our analysis to urban and rural areas separately. We utilise the most comprehensive and representative data of Pakistan Social and Living Standards Measurements (PSLM-2012-13) which covers almost all the districts.

2. SIGNIFICANCE AND OBJECTIVES OF THE STUDY

Enhancing economic growth, and reducing inequality and poverty, are the main concerns of policy-makers throughout the world, as well as in Pakistan. Pakistan's growth rate remained below other countries in the region. It also has a lower per capita

income, high multidimensional poverty, and a low quality of human capital.[1] The average years of schooling are 4.7 years only, ranking Pakistan 150th in the world. Inequality in education is 44.4 percent, much higher than the global average of 26.8 percent. Pakistan spends 2.5 percent of GDP[2] on education, which makes it amongst the lowest in the world, ranking 147th out of 188 countries.

Most researchers and policy-makers focus at the macro dimensions of these indicators. For example, what are the determinants of economic growth and inequality? Which factors are most and least important? There seems to be little research available regarding inequality in opportunity via educational mobility in Pakistan. There is an increasing role of human capital in economic growth, which in turn affects fertility and mortality (Meltzer, 1992). Decisions about fertility and education depend on constraints faced by parents, as well as their preferences. This provides a strong basis for the role of family in the transmission of human capital in theories of intergenerational mobility.

In this study, our focus is on intergenerational mobility in educational attainments with reference to Pakistan. Due to the nature of available data, our analysis is limited to co-resident father-son only. Most females leave the parents' home after marriage so limited observations are available, especially for those over 25 years of age. Moreover, the number of educated females, especially those obtaining higher education, is very low. Of co-resident mothers, 83.36 percent never attended school. For these reasons, our analysis is limited to intergenerational mobility in educational attainments of co-resident father-son data only. Specific objectives of the study are:

- To examine structure of educational attainments in both fathers and sons generations.
- To investigate intergenerational mobility at the secondary and higher levels of education.
- To examine the differences in intergenerational mobility in education across urban and rural areas.

3. LITERATURE REVIEW

Intergenerational mobility is one of the most studied topics in social sciences. The first study dates back to Galton (1886), a biologist, who regressed heights of children on the heights of their parents. Leading economists started to evaluate income mobility in the latter half of the 20th century. Pioneering studies can be attributed to Soltow (1965), and Wolff and Slijpe (1973) for Scandinavia, and Sewell and Hauser (1975) for US. However, economists developed an interest in this topic after Becker and Tomes (1979, 1986) formally developed a model of the transmission of education, earnings, assets and consumptions from parents to children. Much research is available on the positive relationship between the level of education of parents and their children.

Mare (1980) shows that the impact of parental education and income declines as the child progresses to higher education. Lillard and Wallis (1994) found that educational effects moved along gender lines in Malaysia where a mother's education had a strong effect on her daughter's education, and a father's education had a relatively higher impact

[1] Ranked as 147th out of 188 countries with HDI value of 0.538 (UNDP-2015).
[2] This figure is for year 2014.

on his son's educational level. However, in general, for educational attainments of children, a father's education is more important as compared to their mother's. Burns (2001) shows that a child with a poorly educated mother and a highly educated father has the same schooling outcomes as having two well-educated parents.

Spielaure (2004) observes higher mobility at higher levels of education for Australia, which varies across regions and gender. Hertz et al. (2007) observe significant regional differences in educational mobility in a sample of 42 countries with Latin America being the lowest and the Nordic countries the highest. In Switzerland, Bauer and Riphahn (2009) show a positive impact of early enrolment on educational mobility, which, according to authors, is because once children are in school, inequalities in family background have a lesser impact on their education.

Van Doorn et al. (2011) found that industrialisation, female participation in the job market, and increase in educational expenditure positively influences intergenerational educational mobility. In China, apart from parental education, Labar (2011) finds a significantly positive affect of income, and being located in an urban area, on education of a child. Parental characteristics increase in importance at a higher level of education.

In India, Azam and Bhatt (2015) find upward mobility in educational attainments and show that mobility has a strong association with the per capita spending on education at the state level. Moreover, Assad and Saleh (2016) show a significant impact of public school supply on intergenerational mobility in education in Jordan. The study also finds that daughters are more mobile compared to sons, especially in the current cohorts. Nguyen and Getinet (2003) show that in the U.S. an increase in the number of children in a family dilutes the resources of parents and thus reduces educational mobility.

Researchers studying this topic for Pakistan include Havinga et al. (1986), Cheema and Naseer (2013), and Javed and Irfan (2014). Havinga et al. (1986), in a sample from 10 major industrialised cities, finds that 31 percent of the sons have a higher income than their fathers, with 60 percent of the sons owning more wealth than their fathers did. For rural Sargodha, Cheema and Naseer (2013) show an increase in intergenerational mobility in education as grandfather-father pairs show more rigidity than father-son pairs. Their results also indicate that mobility in non-propertied groups is less than in propertied groups, and is much higher among *zamindar*(landlords) than in *artisan* and *historically depressed quoms* (sects).

Using data from the Pakistan Panel Household Survey (2010), Javed and Irfan (2014) show a strong persistence in educational attainments. Particularly, this persistence is higher in older cohorts as compared to younger cohorts. They also find more persistence in low status occupations and downward mobility in high status occupations. Further, a higher persistence at the lowest income quintile is evident. Regression results of their study suggest that income mobility in urban areas is higher than in rural areas, with older cohorts being more mobile than younger cohorts are.

4. THEORETICAL FRAMEWORK

We utilise models developed by Becker and Tomes (1979), and Becker et al. (2015), in which parents are assumed to be altruistic. They not only care about their own utility, but also care about the "quality" and "economic success" of their children in the form of income as given by the following utility function:

$$V(Y^P) = u(c) + \alpha Ev(Y^{ch}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where Y^P and $V(Y^P)$ are income and total utility of parents respectively, $u(c)$ is the utility that parent derive from consumption (c), α is the degree of altruism which ranges from 0 to 1. $Ev(Y^{ch})$ is the expected utility a child derives from income (Y^{ch}) in future. Let Y_H is the amount invested in the human capital formation (education) of a child by parent and τ is the cost of consumption forgone against each unit of Y_H, then budget constraint of parents can be written as

$$C + \tau Y_H = Y^P \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

By assuming that value of each unit of human capital accumulated in children is equal to w_1, the present value of this investment can be expressed as:

$$\tau Y_H = \frac{w_1 Y_H}{1+r} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Total income of a child is equal to the sum of income earned from "human capital (Y_H)", "endowed capital (K)" and "labour market luck (g)" (Becker and Tomes, 1979) and can be expressed by the following equation:

$$Y^{ch} = w_1 Y_H + w_2 K + w_3 g \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Putting Equations (4) and (3) into Equation (2), we get the budget constraint

$$C + \frac{Y^{ch}}{1+r} = Y^P + \frac{w_2 K}{1+r} + \frac{w_3 g}{1+r} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

Parents maximise utility (1) subject to budget constraint (5). This provides the basis for intergenerational linkages between parental characteristics and the human capital of children.

Parental education influences the level of education of their children through different mechanisms:

(1) Highly educated parents generally have higher incomes, which relaxes their budget constraints and may positively affect educational attainment of their children.
(2) Educated parents may be more efficient in child rearing activities, which results in higher educational attainment by the child.
(3) Parents that are more educated may be more successful in directing expenditures towards child-friendly activities and investments.
(4) Educated parents may have a greater concern for the education of their children as compared to uneducated parents[3] and are more likely to help children with homework, being able to guide them better with their schooling.

With this background, our general model is

$$ED_{ij}^{ch} = f(ED_{ij}^{P}, Y_i^P, \mathrm{X}) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

where ED_{ij}^{ch} is the j^{th} level of education of an i^{th} child, ED_{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.

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

Along with education and income of parents, some additional factors to consider:

- ***Wealth*** influences education attainment of a son. More wealth in the form of durables means that the family has already met its needs and more income is available for the children's education. Moreover, wealth, especially land, is available as collateral for a loan to finance education in case parents are facing financial constraints.
- ***Additional children*** the amount of time, money, and patience that each child receives from parents are diluted and may strain the parents' finite resources. Therefore, the chance for a child to achieve higher social status, for example, through higher level of education is reduced (Downey, 1995; Maralani, 2008).
- ***Age of a child*** is another factor that is a control variable. As the age of a child increases, we expect an increase in his/her level of education.
- ***Geographic location*** may be capturing, for example, availability and quality of schools across different provinces, and across urban-rural areas. It captures peer effects as well as the environmental effects.

With these parameters we can write Equation (6) as:

$$ED_{ij}^{ch} = f(ED_{ij}^{P}, Y_i^P, W_i^P, HS_i, A_i^{ch}, R_R, P_p, P_S, P_B) \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

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^{ch} is the age of i^{th} child, R_R equal to "1" if a child belongs to rural region and equal to "0" otherwise. P_p, P_S and P_B are dummies for provinces Punjab, Sindh and Balochistan respectively. Province Khyber Pakhtunkhwa (KPK) is used as reference province. In stochastic form, Equation (7) can be written as:

$$ED_{ij}^{ch} = \beta_0 + \beta_1 ED_{ij}^{P} + \beta_2 Y_i^P + \beta_3 W_i^P + \beta_4 HS_i + \beta_5 A_i^{ch} + \beta_6 (A_i^{ch})^2 + \beta_7 R_R + \beta_8 P_p + \beta_9 P_S + \beta_{10} P_B + e_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (8)$$

$(A_i^{ch})^2$ is the square of age of *i*th child. Error term "e_i" captures the effects of all other omitted variables.

5. DATA

We utilise PSLM (2012-13) survey data, which covers urban and rural areas of all districts of the four provinces of Pakistan. However, there are some issues and limitations of the PSLM survey data:

(1) PSLM survey focuses on co-resident children-parents pairs only and misses information regarding younger generations who are living out of the parents' residence.
(2) Survey does not report information regarding the fathers of married women, who constitute the majority of women.
(3) In our co-resident data, 84.36 percent of the mothers have never attended schools and their frequency in the "postgraduate" category is zero. For this reason, our analysis is restricted to co-resident father-son pairs only. We extracted information on 39989 co-resident father-son pairs, with sons of age 16 years and above, who have completed their education and are not currently enrolled in any

educational institution. Once we identified father-son pairs then data on relevant variables were obtained. These variables are discussed below.

Originally, 21 categories of *Levels of Education* are framed, including "no education" in the PSLM data. We drop category "other" which consists of mixed levels of education such as short diploma, short certificate, religious education etc. The remaining 20 categories are re-coded into 7 categories: (1) Never attended school (2) Up to Primary (3) Up to Middle (4) Matriculation (5) Intermediate (6) Graduate (7) Post-Graduate.

Income of father is the sum of all types of income he receives from various sources. This includes salary, wages, pension, remittances, and rent from property. We construct a wealth index for variable ***wealth*****,** which includes twenty durables,[4] access to two public utilities,[5] four housing characteristics,[6] source of cooking fuel, type of phone used for communication (land line, mobile or both), personal agricultural land, poultry, livestock, non-agriculture land, and residential / commercial property. This set of assets is selected due to their availability in PSLM survey. We use Principal Component Analysis (PCA) for the construction of wealth index**.**

Household size means the number of individuals living in a household. Information on household size is taken from the roster of PSLM. *Age of a son* is reported in years. *Region effects* are captured through dummy variables. For rural-urban areas, we introduce a dummy variable which takes value "1" if rural and "0" otherwise. For provinces, we introduce three dummy variables for Punjab, Sindh and Balochistan. KPK is taken as reference province.

6. RESULTS AND DISCUSSION

To understand the structure of educational attainments we compute percentage distribution of sons and fathers falling in different levels of education. This is useful for further analysis of educational mobility. Table 1 summarises the results.

Table 1

Percentage Distribution of Different Levels Education

	Father			Son		
Level of Education	Pakistan	Urban	Rural	Pakistan	Urban	Rural
Never Attend School	58.4	39.9	67.0	27.6	15.2	33.3
Primary	17.5	19.7	16.5	22.6	17.9	24.7
Middle	9.4	13.5	7.4	20.7	23.7	19.3
Matric	9.0	15.6	6.0	16.6	21.1	14.7
Intermediate	2.8	5.3	1.6	6.8	10.7	5.1
Graduate	1.4	2.7	0.8	3.2	6.0	1.8
Post Graduate	1.5	3.3	0.7	2.5	5.5	1.1
Average Years of Education	3.5	5.3	2.5	6.2	7.9	5.3

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

[4] 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.

[5] Water and electricity.

[6] Number of sleeping rooms, quality of floor material, quality of wall material and toilet facility.

Percentages in the lower levels of education are higher for both fathers and sons. For example, in Pakistan overall, 85.3 percent of fathers fall below matric and only 14.7 percent fall in the matric and higher levels of education. The same figures for sons are 70.9 percent below matric, and 29.1 percent in matric and higher levels of education.

Results also reveal that the rural population is skewed towards low levels of education as compared to the urban population.[7] However, the percentages of sons in matric and higher levels of education (43.3 percent in urban areas and 22.7 percent in rural areas) are greater than the percentages of fathers (26.9 percent in urban areas and 9.1 percent in rural areas) in the same levels of education. Finally, the average years of schooling in the sons' generation is higher than the average years of schooling in the fathers' generation in Pakistan overall (6.2 vs. 3.5), in urban (7.9 vs. 5.3) and rural (5.3 vs. 2.5) areas. The average years of schooling in urban areas are higher than the average years of schooling in rural areas, for both generations, indicating that the urban population is more educated than the rural population.

These results indicate that most of the population in Pakistan, rural and urban, either never attends school, or falls in the lower levels of education. In addition, the percentage of sons in higher educational levels is greater than fathers'. Conversely, the percentage of sons in lower educational levels is less than the fathers'. This gives some insights into upward mobility in educational attainments of the sons' generation.

When we talk about educational mobility, we first determine whether a son falls in the educational category of his father or otherwise. If he does then the educational status of a son depicts persistence or immobility. However, if he does not, then there is educational mobility either upwards or downwards. For this purpose we compute contingency tables—Table 2.

Values of Pearson Chi square in all three cases indicate the existence of significance correlation between levels of education for fathers' and sons'. Results of the data for Pakistan show that (a) frequencies of sons in the levels of education where fathers fall are highest, or , (b) highest in the higher levels of educations than the fathers' levels of education and, (c) lower for intermediate where the majority of sons fall in matric. A similar pattern can be observed in the data for urban areas. However, in the data for rural areas, we can observe that frequencies of sons whose fathers fall in the intermediate and graduate levels of education are highest in matric. These results indicate persistence in the level of education, with upward mobility at low levels, and downward mobility at college and university levels. From the above contingency table, we compute conditional probabilities of sons in Table 3 below. Each row of the table shows the chances of sons to attain different levels of education given the level of education of their fathers.

[7]90.9 percent of the fathers and 77.3 percent of the sons fall in below matric level of education in rural region as compared to 73.1 percent of the fathers and 56.8 percent of the sons in the same categories in urban region.

Table 2

Contingency Table

	Educational Levels of Sons							
	Overall Pakistan							
Educational Levels of Fathers	Never attend School	Primary	Middle	Matric	Inter-mediate	Graduate	Post Graduate	Total
Never Attend School	8679	5334	4042	2868	889	293	199	22304
Primary	1031	1635	1665	1352	542	206	126	6557
Middle	371	636	1231	1034	432	180	133	4017
Matric	230	406	896	1284	604	395	314	4129
Intermediate	50	81	187	351	271	192	159	1291
Graduate	28	34	66	173	149	188	221	859
Post Graduate	18	17	42	97	162	170	326	832
Total	10407	8143	8129	7159	3049	1624	1478	39989
Pearson		chi2(36) = 14000				Probability = 0.00		
		Urban				Total		
Never Attend School	1560	1209	1290	922	343	120	83	5527
Primary	265	521	672	565	255	128	60	2466
Middle	155	271	576	517	227	105	88	1939
Matric	112	206	445	718	364	269	222	2336
Intermediate	25	31	110	198	181	143	110	798
Graduate	13	13	26	101	93	143	182	571
Post Graduate	8	5	21	55	103	132	262	586
Total	2138	2256	3140	3076	1566	1040	1007	14223
Pearson		chi2(36) = 5300				Probability = 0.00		
		Rural				Total		
Never Attend School	7119	4125	2752	1946	546	173	116	16777
Primary	766	1114	993	787	287	78	66	4091
Middle	216	365	655	517	205	75	45	2078
Matric	118	200	451	566	240	126	92	1793
Intermediate	25	50	77	153	90	49	49	493
Graduate	15	21	40	72	56	45	39	288
Post Graduate	10	12	21	42	59	38	64	246
Total	8269	5887	4989	4083	1483	584	471	25766
Pearson		chi2(36) = 6100				Probability = 0.00		

Table 3

Conditional Probabilities

	Overall Pakistan						
Educational	Educational Attainments of Sons						
Attainments of Fathers	Never attend School	Primary	Middle	Matric	Intermediate	Graduate	Post Graduate
Never Attend School	38.91*	23.91*	18.12*	12.86*	3.99*	1.31*	0.89*
Primary	15.72*	24.94*	25.39*	20.62*	8.27*	3.14*	1.92*
Middle	9.24*	15.83*	30.64*	25.74*	10.75*	4.48*	3.31*
Matric	5.57*	9.83*	21.7*	31.1*	14.63*	9.57*	7.6*
Intermediate	3.87*	6.27*	14.48*	27.19*	20.99*	14.87*	12.32*
Graduate	3.26*	3.96*	7.68*	20.14*	17.35*	21.89*	25.73*
Post Graduate	2.16*	2.04*	5.05*	11.66*	19.47*	20.43*	39.18*
			Urban				
Never Attend School	28.23*	21.87*	23.34*	16.68*	6.21*	2.17*	1.5*
Primary	10.75*	21.13*	27.25*	22.91*	10.34*	5.19*	2.43*
Middle	7.99*	13.98*	29.71*	26.66*	11.71*	5.42*	4.54*
Matric	4.79*	8.82*	19.05*	30.74*	15.58*	11.52*	9.5*
Intermediate	3.13*	3.88*	13.78*	24.81*	22.68*	17.92*	13.78*
Graduate	2.28*	2.28*	4.55*	17.69*	16.29*	25.04*	31.87*
Post Graduate	1.37*	0.85**	3.58*	9.39*	17.58*	22.53*	44.71*
			Rural				
Never Attend School	42.43*	24.59*	16.4*	11.6*	3.25*	1.03*	0.69*
Primary	18.72*	27.23*	24.27*	19.24*	7.02*	1.91*	1.61*
Middle	10.39*	17.56*	31.52*	24.88*	9.87*	3.61*	2.17*
Matric	6.58*	11.15*	25.15*	31.57*	13.39*	7.03*	5.13*
Intermediate	5.07*	10.14*	15.62*	31.03*	18.26*	9.94*	9.94*
Graduate	5.21*	7.29*	13.89*	25.00*	19.44*	15.63*	13.54*
Post Graduate	4.07*	4.88*	8.54*	17.07*	23.98*	15.45*	26.02*

Note: * P < 0.01, ** P < 0.05, *** P < 0.1.

High persistence can be observed in educational attainment, as values in the principal diagonal are higher than the values of off diagonal in most cases. This persistence is highest for the extreme categories. A son of a father who is in "never attend school" has a 38.91 percent chance of falling in the same "never attend school" category. His chance to move to the highest level of education (postgraduate) is only 0.89 percent. Similarly, high rigidity can be observed in the "postgraduate" level where the probability of a son to attain "postgraduate" level of education is 39.81 percent given that his father has also attained "postgraduate" level of education, and his probability to fall in "never attend school" is only 2.16 percent.

A panoramic view of the results suggests that although there is persistence in educational attainment, on average the chances of a son to achieve the same level of education as his father did, or more, are higher than his chances to lag behind his father's educational level.[8] Similarly, from the figures in the columns we can observe that when a father is switching to higher levels of education, the probability of the son to remain in lower levels of education decreases while his probability to attain high levels of education increases. Our findings comply with the earlier findings by Javed and Irfan (2014). Results of Labour (2011) for China also depict a similar pattern, but relatively more mobility is observed for the lowest category (primary level of education), in this study.

Rural and urban area data present a slightly different pattern. While rigidity is greater at a higher level of education in urban areas, a higher persistence can be observed in the lower levels of education in rural areas.[9] Urban data reflect an upward mobility in the "Graduate" category, while rural data exhibit downward mobility for the same level of education. Here, our results contradict Javed and Irfan (2014) who find a larger persistence in rural areas, and more downward mobility in urban areas at the "Graduate" level.

Quartile distributions of sons' education over fathers' education are presented in Figure 1 and Figure 2 (Appendix-A) for overall data, and for urban-rural areas respectively. Figures reflect persistence in education as levels of education of sons increase, with the increase in levels of education of their fathers. Figure 1 also reflects upward mobility at low levels and downward mobility at high levels of education in the overall data for Pakistan. However, a comparison of the urban and rural population exhibits more downward mobility at college and university levels of education (Figure 2).

We conclude from the above results that chances of a son attaining high (low) level of education increase when the father also has a high (low) level of education. This shows a sort of persistence in educational attainments; sons imitate fathers. Results also reveal that on average, sons get a higher level of education as compared to their fathers and thus on average the status of sons increases in terms of educational attainment as compared to their fathers.

[8] We have also computed overall downward mobility, immobility and upward mobility for overall Pakistan as well as for urban and rural regions given in Table-A1 in Appendix-A

[9] In urban region, the probability of a son to remain in "never attend school" category is 28.23 percent if his father is also in "never attend school" while the same probability is 42.43 percent in rural regions. On the other hand, probabilities of sons to attain the "post graduate" level of education given that father also attains "post graduate" are 44.71 percent and 26.02 percent in urban and rural regions, respectively.

Therefore, we have related the educational level of a son to the educational level of his father to find mobility without bringing the role of other variables into the picture. To find the impact of other variables with the educational level of a father[10] we estimate Equation (8) using multinomial logit model (MNLM). Results are in Table 4 below.

Table 4

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)	(0.006)	(0.006)	(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=Midlle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Marginal effects, calculated from multinomial logit estimates, show that the probability of a son to remain in low levels of education decreases, and his probability to attain high levels of education increases, when his father switches from lower to higher

[10]Model was estimated first by ordered logit method but assumption of parallel regression required for ordered logit was rejected by Brant test. Further, results of Hausman test given in Table-A2 of Appendix-A, support the assumption of "Independence of Irrelevant Alternatives" (IIA), which is required for the validity of MNLM. Likelihood Ratio (LR) test given at the lower panel of the Table-A2, shows that overall model fits significantly better than a model with no explanatory variable.

levels of education. [11] Overall results exhibit elements of persistence (immobility) as well as mobility in educational levels. On average, when a father moves to a higher level of education, the increase in the probability of a son in the levels of education where both fathers and sons fall are higher, showing immobility or persistence. We also observe an increase in probabilties of sons to attain higher levels of education than their fathers indicating upward mobility.

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 the findings of Girdwood and Leibbrandt (2009) for South Africa. They find relatively more mobility except at the highest level of education. We find more persistence at the highest level of education while Girdwood and Leibbrandt (2009) results show downward mobility at that highest level of education.

Results also reveal that children of affluent families have a greater chance to move to higher levels of education as indicated by the positive signs of the income and wealth variable with the middle to high level of education. Their chances to remain in the *never attend school* catergory or in the *primary school* category decrease with an increase in income and wealth of the family.

Household size confirms the resource dilution hypothesis. The negative sign for middle and higher level education shows that the probability of getting higher level education decreases with an increase in household size. Since money does not affect the primary and middle level of education as much, with the increase in the number of children, the probability of a son to attain primary and middle level of education increases, as is evident from the positive sign of the marginal effect with the variable of household size against the primary and middle levels of a son's education. Similarly, the probability of *never attend school* also increases with the increase in family size. Similar results are found by Nguyen and Getinet (2003) for the U.S.

The positive signs of marginal effects of age at matric and higher, and negative sign for below matric levels of education, show that increase in age of a son increases his probability to move to higher levels of education, reducing the chances to stay in the lower levels.

Regional variables: rural and urban areas, and provinces, are used to control for regional hetrogeniety as educational facilities, policies and priorities vary from province to province. Results also confirm that changes in probabilities vary considerably across the regions. For the sake of comparison of educational mobility in urban and rural areas, we estimate separate regressions for both areas and present the results in Table-A3 and Table-A4 of Appendix-A. Results show the following differences between urban and rural areas:

(1) Increase in probability of levels of education where both son and father fall, is higher in rural areas relative to urban areas up to the intermediate level. The

[11]for example if father switches 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 probabilities to attain primary, middle, matric, intermediate, graduate and post graduate levels increase by 2.51, 4.2, 5.23, 2.63, 1.13 and 0.48 pecentage points, respectively. Similaly, when father moves to Post Graduate the probability of a son to achieve Post Graduate level of education increases by 14.75 percentage points while his probability to remain in lowest category of education decreases by 19.02 percentage points.

same probability is higher in urban areas relative to rural areas for graduate and postgraduate levels of education.

(2) In urban areas, when a father is moving from "never attend school" to any higher level of education, the increase in probability for his son is either the maximum in levels of education where both son and father fall, or an increase in the probability that the son will fall in the higher level of education category than his father. In rural areas, the probability is at maximum that the son will fall in lower levels of education than the father will, when the father is moving from "never attend school" to intermediate, graduate or postgraduate levels of education.

(3) When the father is advancing from "never attend school" to college or university levels of education, the increase in probability that the son will also attain college or higher levels of education is higher in urban than in rural areas. These results indicate that although there is strong persistence in educational level, upward mobility is also observed. This mobility is stronger in urban areas as compared to rural areas. In rural areas, downward mobility can be observed at college and university levels of education.

Affluent families in urban areas are more likely to get a higher level of education as compared to the families in rural areas, as indicated by the larger increases in probabilities of college and university education, due to an increase in income and wealth in urban areas. In both urban and rural areas, the chance of a son going forward to higher education decreases with an increase in family size. Magnitudes of the marginal effects of age variables indicate that sons in urban areas are more likely to complete various levels of education earlier than sons in rural areas. Finally, province dummies show significant differences in educational mobility across the provinces.

7. CONCLUSION AND POLICY IMPLICATIONS

Intergenerational mobility in socioeconomic status represents the equality of opportunities available to individuals in a country. It affects productivity of individuals and thereby overall inequality and economic growth of a country. As the level of education determines the income and other socioeconomic outcomes, we used it as a proxy to calculate the overall socioeconomic status of an individual. We examined intergenerational educational mobility in Pakistan, comparing the differences in urban and rural areas as well.

We used data of PSLM survey of 2012-13. Our results reveal that percentages of both father and son generations are high in primary education in Pakistan overall, as well as in urban and rural data. However, percentages of sons having higher education are higher than the percentages of fathers. Further, results of contingency tables and MNLM revealed strong rigidity. Fathers are more likely to transmit the same level of education to their sons. Sons of less educated fathers are more likely to remain less educated and the sons of highly educated fathers are more likely to get higher levels of education. While persistence in education is strong at the lower levels in urban areas, there is more persistence at higher education levels in urban areas.

Our research showed upward mobility due to educational attainment, with urban areas showing higher upward mobility than rural areas. We also found that higher education positively affected increase in income and wealth of households. However, a

larger family was found to hinder mobility. Further, the chance to get college and university education was higher for sons in urban areas, with them more likely to reach educational levels earlier than sons in the rural areas were.

Although overall results suggest an upward mobility trend, Pakistan still lags behind the developed world with an average schooling of 4.7 years only. There is an urgent need for further increase in educational mobility. Government programmes to provide funding for higher education to underprivileged students will go a long way towards improving mobility and raising the educational levels of Pakistan's work force.

Some policies that would help achieve the above stated objective:

- Government should require mandatory enrolment of children in primary school at a specific age. This will ensure that schooling starts at an early age.
- Financial constraints of families tend to have less of an effect on the education of children once they are enrolled in school (Bauer and Riphahn, 2009). Early enrolment should specially be ensured in rural areas where students tend to complete their schooling later than their counterparts in urban areas.
- A carefully thought out policy of family planning to limit family size is required. Limiting family size would affect middle-income groups only. Since low-income families have a lack of resources to begin with, having more children will not have the negative effect of resource dilution on this section of the population (Steelman et al., 2002; Van Bavel, 2011).

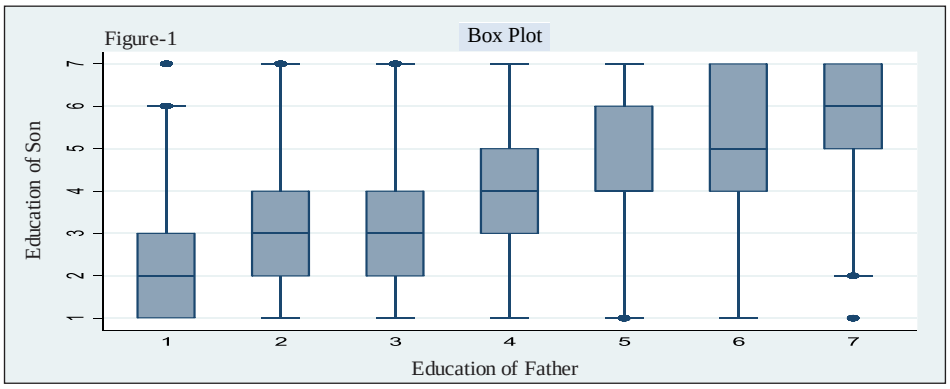
Finally, opportunities for children stem from family support and ideology, so reliance upon the education system solely to increase mobility may be an overly optimistic strategy. Institutional reforms and behavioural changes are required to improve educational mobility and thereby the socioeconomic status of the current generation.

APPENDIX

Table A1

Educational Mobility: Summary of Transition Matrices

Region	Downward Mobility	Immobility	Upward Mobility
Pakistan Overall	12	36	52
Urban Overall	16	29	55
Rural Overall	10	39	51



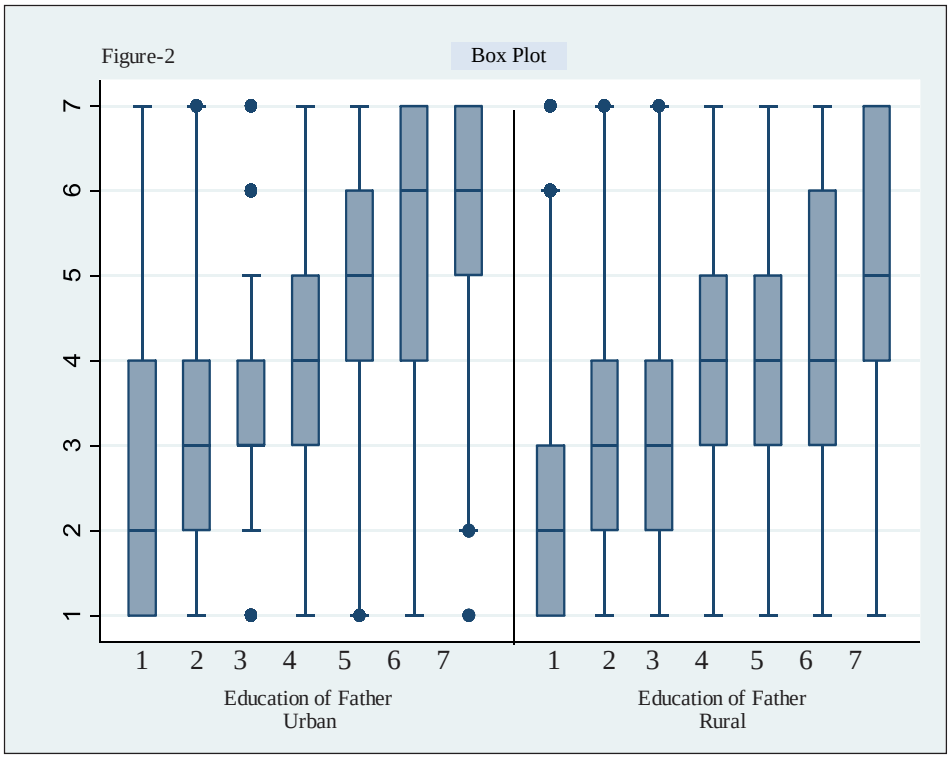


Table A2

Statistical Tests for Testing Validity of Multinomial Logit Model

	Hausman Test of IIA		
Education of Son	chi2	d.f.	P>chi2
NAS	49	75	0.99
Primary	80	74	0.31
Middle	60	75	0.90
Matric	–24	74	–
Intimidate	61	74	0.87
Graduate	–38	74	–
Post Graduate	28	74	1.00
	LR chi2(84)	=	22512.31
	Prob> chi2	=	0.00
	Pseudo R2	=	0.1604

Table A3

Marginal Effects of Educational Mobility (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=Midlle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son.

Table A4

Marginal Effects of Educational Mobility (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=Midlle, MTC = Matric, INT = Intermediate, GRD = Graduate, PGR= Post Graduate, _F= father, _S= son

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