Poverty and Social Dynamics Paper Series
PSDPS : 5

Intergenerational Mobility: Evidence from Pakistan Panel Household Survey

Sajid Amin Javed

and

Mohammad Irfan

PAKISTAN INSTITUTE OF DEVELOPMENT ECONOMICS
ISLAMABAD

Pakistan Institute of Development Economics
Islamabad, Pakistan

E-mail: publications@pide.org.pk
Website: http://www.pide.org.pk
Fax: +92-51-9248065

Designed, composed, and finished at the Publications Division, PIDE.

C O N T E N T S

List of Tables

I. INTRODUCTION

Intergenerational mobility dynamics has long been bewildering social scientists. The slogan of equality of opportunity underlies the very motivation to understand intergenerational education, occupational or earning (im)mobility. In particular income mobility has remained the most explored dimension leaving educational and occupational mobility behind in terms of the empirical expeditions undertaken, documenting the extent to which the economic position of the father determines the income of the son rather than his own education and skill[1]. Improved econometric techniques have generated a volume of empirical studies.

In contrast to emphasis on the description of the shifts in ranking and positions and the descriptive aspect of intergenerational mobility not much has been done to explore the process underlying it. It needs to be kept in mind that the allocative process depicting hierarchies and positions is a by-product of the overall socio-economic and political context. It is in this sense the study of intergenerational mobility becomes complex in nature and demands a great deal of information.

It may however be noted that in this study the authors are confined to a descriptive analysis of intergenerational mobility which refers to the changes in the positions and ranking of individuals using the transition matrix as a summary measure of intergenerational mobility index. The analysis is further subjected to estimation of elasticity of intergenerational mobility by applying Ordinary Least Squares (OLS) and Two Stages Least Square (2SLS). The exercise skirts the normative aspect of the subject. The rest of the paper is structured as follows: this section is followed by section II furnishing a brief review of the literature. Section III details the empirical illustrations while results and discussion are presented in section IV. Section V concludes the study.

II. LITERATURE REVIEW

Those who are born rich are likely to remain rich since, along with other factors, a higher investment in education precludes the chances of zero intergenerational earnings correlations, as rewards/returns are higher on higher education [Solon (2004)]. Income distribution can be persistent; on the other

---

The authors are, respectively, Associate Professor and Consultant at the Pakistan Institute of Development Economics (PIDE), Islamabad.

Authors' Note: The authors would like to thank Dr G. M. Arif for suggestions and Masood Ashfaq for his support in data construction.

[1]See Bjorklund and Jantti (2009), Blanden (2009), Corak (2006), Grawe (2004), and Solon (2002) for excellent survey.

hand, because of genetic differences also, common in terms of outcome but different in terms of policy implications, where the former assigns an active role to public sector to reduce the intergenerational differentials through increased educational opportunities, whereas the latter leaves very narrow space for public policy [Black and Devereux (2010)].

Intergenerational income elasticity and correlation stand as the most widely used measures. Intergenerational elasticity, the coefficient of the father's log income in standard regressions, is preferred over correlation, being unbiased to any measurement errors in the son's income (the dependent variable). Intergenerational income elasticity is also sensitive to the data period (T) used in analysis where it is the increasing function of T [Mazumder (2005)]. Also the sensitivity of intergenerational income elasticity to the point of time at which the income of the son and the father is observed, is a revealing fact known as life cycle bias.[2] Nilsen, *et al.* (2008) also provide evidence on the life cycle bias for Norwegian data.

Coming to the empirical studies in the field with respect to time and region, Jantti, *et al.* (2006), studying six countries including USA and UK, find the highest persistence or immobility for USA for the earnings of the son. Bratsberg, *et al.* (2007) confirm the non-linearity of the son-father income nexus using data for USA, UK, Denmark, Finland and Norway. The intergenerational elasticity estimates for Italy and France are estimated to be 0.5 [Piraino (2007), Mocetti (2007)] and 0.4 [LeFranc and Trannoy (2005)] respectively. Leigh (2007), Corak and Heisz (1999) and Vogel (2008) report much lower intergenerational income elasticity for Australia, Canada and Germany. This difference in intergenerational elasticity estimates may stem, along with other factors, from public education system[3], political participation [Ichino, *et al.* (2009) and different labour market dynamics [Blanden (2009)]. Credit constraints, as proposed by Solon (2004) can determine the size of intergenerational income elasticities. Han and Mulligan (2001), Grawe and Mulligan (2002), and Grawe (2004) provide the theoretical underpinnings for the effect of credit constraints on intergenerational elasticity.[4] A bulk of the empirical literature on intergenerational income mobility, based on US data, especially so in 1970s and 80s, reports intergenerational elasticity of 0.2 [Sewell and Hauser (1975); Bielby and Hauser (1977); Behrman and Taubman (1985)].[5] The intergenerational mobility estimates, confined to USA for a certain period, can now be traced across the globe including UK [Nicoletti and Ermisch (2007);

[2]Refer to Haider and Solon (2006), Grawe (2006) for details.

[3]See Davies, Zhang, and Zeng (2005) for one theoretical exposition. Pekkarinen, *et al.* (2009) gives evidence on the issue.

[4]Grawe (2004) outlines the approaches to empirical analysis of the argument. Mulligan (1997) provides empirical evidence for budget constraint hypothesis.

[5]Solon (1992) and Zimmerman (1992) criticize these studies on account of ignoring measurement errors and sample bias.

Dearden, *et al.* (1997)]; Brazil [Dunn (2007)], Malaysia [Lillard and Kilburn (1995)], Chile [Nunez and Miranada (2010)]; Finland [Österbacka (2001)] along with many others.[6]

To conclude the section, the literature was scanned to find relevant studies on Pakistan in respect of intergenerational income mobility indicators but no such study could be found. The available studies, though not explicitly claiming exploration of intergenerational mobility, examine the role of parental characteristics on school enrolment of children in a choice theoretic framework primarily focusing on parental capacity to invest in education of children [Burney and Irfan (1991)][7] and the rate of return on education reporting also the dependence of individual wages on his/her father's wage and parental education [Shahrukh and Irfan (1985)]. A recent study by Shehzadi, *et al.* (2012), based on a small survey, provides intergenerational social mobility and child development link for Faisalabad. Havinga, *et al.* (1986) deal with intergenerational mobility and social change in Pakistan, based on a pilot survey and applying the Pearson Correlation, find upward intergenerational mobility varying across the provinces. This study is different from the above referred studies on Pakistan in nature and scope. Firstly, none of the above studies explores intergenerational income mobility explicitly. Secondly, we improve on methodology and estimation techniques as this study controls the life cycle bias and endogeneity involved in estimation of intergenerational income mobility.

III. DATA AND METHODOLOGY

Data are taken from Pakistan Panel Household Survey (PPHS) 2010; a survey administrated by Pakistan Institute of Development Economics (PIDE) since 2001.[8] The PPHS, providing rich information on socio-economic characteristics of households, covers 4246 households divided into 2746 urban and 1500 rural units respectively.[9] Separate modules for males and females were administrated to collect the information at household level [for more detail, see Nayab and Arif (2012)]. Data was extracted from the household roster and the education and employment sections of the questionnaires and merged on the basis of their common household identification codes. In the male module, the data includes the characteristics of sons and fathers respectively. All information on daughters is excluded because of smaller number of observations for working

[6]All these studies are common in sense that they reach to the conclusion that USA has severe income inequality issues compared to other countries.

[7]Shahrukh and Irfan (1985) also examines determinants of child school enrollment in Pakistan.

[8]PPHS 2010 is 3rd round of the series with 2001 and 2004 completed previously.

[9]Urban sample is covered first time in PPHS 2010 while rural panel comprises 3 crossections of 2001, 2004 and 2010.

daughters. This paper focuses on co-resident[10] sons and fathers reporting positive income falling in the age brackets of sons as (1) less than 21 years, (2) greater than 20 years, (3)25-39 years, and (4) 30-50 years for cohort analysis.[11] The detail of sample size against different filters imposed for analysis is given below:

Table 1

Sample Size Details

Sample	Numbers
Non '0' income sons	2508
Non '0' income sons of working fathers	1398
Working fathers	1398
Working fathers (Urban)	392
Working fathers (Rural)	974
Fathers having non '0' income	1367
Sons having non '0' income and less than 20 years of age	608
Sons having non '0' income and greater than 20 years of age	1900
Sons of working fathers having age less than 21 years	477
Sons of working fathers having age greater than 20 years	921
Sons of working fathers having age greater than 20 years (Urban)	227
Sons of working fathers having age greater than 20 years (Rural)	694
Sons of working fathers having age between 25-39 years	550
Sons of working fathers having age between 30-50 years	247

Methodology

This paper employs two methodologies for empirical analysis namely the construction of transition matrix and regression analysis wherein the former gives the relative position of the child as compared to the father while the latter provides the extent to which the father's economic status impacts the economic status of the son. Regression analysis in its different variants is widely applied in intergenerational mobility literature.[12] Ordinary Least Square (OLS) remains the frequently used technique along with the instrumental variable (IV) approach. This study applies both OLS and IV approach.[13] The analysis starts with the OLS analysis by regressing the son's log income on the father's log income in the first model while in the second model other socio economic characteristics of the son are introduced. OLS regression is performed on the

[10]The exclusion of sons not living with father is a major limitation of the data for this study.

[11]See Appendix I and II for variable construction and data description respectively.

[12]Mulligan (1997), Solon (1992), and Zimmerman (1992) are some examples of studies using models as given in Equation (1) and its variants.

[13]The regression analysis adopted in this study is similar to I-Hsin Li (2011).

fathers' reported and estimated income.[14] To begin the analysis, the following equation is estimated:

$$\bar{Y}_{iS} = \alpha + \beta_1 \bar{Y}_{iF} + \varepsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

Where $\bar{Y}_{iS}$ and $\bar{Y}_{iF}$ are lifelong log incomes of *i*th son and father respectively and ε_i is error term assumed to be distributed as N(0,σ^2). The constant term α comprises the environment that the generation of the sons share commonly while β_1 is the measure of intergenerational persistence or immobility, conversely 1– β_1 gives intergenerational mobility. Generally β_1 takes the value between zero (0) and one (1) where a higher value indicates the higher chances that a son will hold the same socio-economic status as his father did. $\beta_1 = 0$ means perfect mobility where all sons are independent of the father's status, suggesting equality of opportunities or merit based system while $\beta_1 = 1$, indicates perfect immobility and suggests that the son, subtracting any random errors, will exactly inherit the position of the father. β_1, the elasticity measure by construction in Equation (1), indicates the percent difference in the sons' income observed for each 1 percent difference across the incomes of the fathers. A negative value for β_1 would be indicative of lower economic status of the sons in their own generation compared to the position of their fathers who were high in income distribution.

In reality, however, the lifelong incomes of the son and father are captured by the short run measure of income i.e. income measured at a certain point of time (generally past one month or year) so;

$$Y_{iS}(t) = \bar{Y}_{iS} + \beta_i A_{iS}(t) + \upsilon_{iS} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

$$Y_{iF}(t) = \bar{Y}_{iF} + +\beta_i A_{iF}(t) + \upsilon_{iF} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

Both υ_{iS} and υ_{iF} are assumed to be distributed with mean zero and homeskeasdtic. $Y_{iS}(t)$ and $Y_{iF}(t)$ are short run measures of income *i*th son and father, while $A_{iS}(t)$ and $A_{iF}(t)$ are their ages respectively. Solving Equations (2) and (3) for $\bar{Y}_{iS}$ and $\bar{Y}_{iF}$ and substituting in Equation (1) gives the standard intergenerational income mobility specification as

$$Y_{iS} = \alpha + \beta_1 Y_{iF} + \beta_2 A_{iS}(t) + \beta_3 A_{iF}(t) + \upsilon_i \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Where $\upsilon_i = \varepsilon_i + \upsilon_{iS} - \beta_1 \upsilon_{iF}$

To gauge the net effect of the father's economic status on the son's, and to avoid omitting the variable bias, we, in the second step, control Equation (1) for additional characteristics of sons and fathers as given in Equation (5) below.

$$Y_{iS} = \alpha + \beta_1 Y_{iF} + \beta_i X_i + \varepsilon_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

[14]Income of father adjusted for age, occupation and education of father as given in Equation (8) in methodology section.

Where X_i is a set of control variables specifically including the age of the son, the age of the father, the square of the ages of the father and son, the occupation and education of the son etc. What is worth mentioning, however, is that both the ages of the son and father are incorporated simultaneously to account for the life cycle bias as the income for both is not observed at the same point of age. A homogenous income growth is however to be assumed across the individuals in order to tackle the life cycle bias.

The education and occupation of the father are not included in this specification purposefully as the father's income already simulates their effect. The issue is dealt by introducing the estimated income of the father in Equations (1) and (4) giving Equations (6) and (7).

$$Y_{iS} = \alpha + \beta_1 \hat{Y}_{iF} + \mathcal{E}_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

$$Y_{iS} = \alpha + \beta_1 \hat{Y}_{iF} + \beta_i X_i + \mathcal{E}_i \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (7)$$

Where $\hat{Y}_{iF}$ is the estimated income of the *i*th father. The rest of the notations are as explained above. $\hat{Y}_{iF}$ is estimated by the following equation:

$$\hat{Y}_{iF} = \propto + \beta_1 Age_F + \beta_2 Age^2{}_F + \beta_2 Edu_F + \beta_3 Occu_F + \mathcal{E}_i \quad \ldots \quad (8)$$

Equation (8), gives the income of the father adjusted for his age, occupation and education. This estimated income is then placed in Equation (1) and (5) to calculate the intergenerational income mobility. The approach is very similar to the instrumental variable approach though it operates indirectly.

Instrumental Variable Approach

The instrumental variable approach appears to be an important tool in recent literature to tackle measurement biases. Different sets of instruments for the father's income are used in the empirical literature such as occupational status [Zimmerman (1992); Nicoletti and Ermisch (2007); Nunez and Miranada (2010), city of residence of the sons [Björklund and Jantti (1997)] and state (province) of birth [Aaronson and Mazumder (2008)].[15] OLS will produce consistent results only if both the sons' and fathers' income is distributed normally as elaborated in Equation (9).

$$\beta_{OLS} = \frac{\{cov(Y_{iS}, Y_{iF})\}}{var(Y_{iF})} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (9)$$

As we are studying some selective pairs of sons and fathers, OLS will generate inconsistent results [Fertig (2001); Nicoletti (2008)]. Further the bias in OLS estimations is induced because of short run (one year) estimate of

[15]We use education of father, occupation of father and province of residence of son as instruments.

incomes of the father resulting in downward bias in intergenerational elasticity estimates (attenuation bias) [Solon (1992); Zimmerman (1992)].

Most importantly the correlation between υ_{iF} and Y_{iF} causes endogeneity in Equation (4) referred to as the attenuation bias. The attenuation bias can be minimised by averaging the earnings over a certain period of time (generally 5 years). The alternative, and the preferred way, to reduce downward estimation of intergenerational elasticity is to use the IV approach wherein the fathers' income is instrumented by different variables of which the father's educational status and occupation remain most used.

Equation (3) can be expressed as

$$Y_{iF}(t) = \delta q_{iF} + \beta_i A_{iF}(t) + \upsilon_{\mathrm{iF}} = \theta Z_{iF} + \upsilon_{iF} \quad \ldots \qquad \ldots \qquad \ldots \quad (10)$$

Where $\mathrm{Z_{iF}} = \mathrm{q_{iF}}, \mathrm{A_{iF}(t)}$ and q_{iF} denotes instruments.

This estimation methodology is superior to the OLS, in the context of controlling the measurement error effect. The measurement errors in the instrument do not create any nuisance in results as far as these errors are uncorrelated to the error term of regression. Further, education, used as instrument for the father's life time earning, is free of transitory errors hence the IV approach gives consistent estimates for β_1 in Equations (1) and (5).

We estimate Equations (1) and (5) by applying the Two Stage Least Squares (2SLS) approach. The education and occupation of the father, along with some other variables, are used as instruments. The set of instruments, other than the father's education and occupation, varies with the specification depending upon the explanatory variables used. The 2SLS estimations are performed only for the reported income as the estimations based on estimated income are the indirect mode of 2SLS.

IV. RESULTS AND DISCUSSION

The percentage occupational and educational distribution of the fathers and sons is reported in Table 2 where, quite interestingly, 48.6 percent of the sons of working fathers reported working in elementary professions while the same was 33.3 for fathers. It is also evident from the information that 94.3 percent of the sons and 95.2 percent of the fathers work in elementary services and agriculture etc. respectively and a very small number joins blue collar professions like technicians.[16]

[16]Given the fact that all major urban centers were not covered in PPHS 2010, the occupational, educational and income distribution could be divergent from those reported in the surveys like PSLM and LFS.

Table 2

Percentage Distribution of Respondents with Respect to Occupation and Education

Indicators Occupation	All Sons	Sons of Working Fathers	All Fathers	Working Fathers Only
Elementary[a]	46.8	48.6	33.3	In occupational distribution, working fathers are unit of the analysis so "all fathers" is exactly "working fathers only"
Services/Agriculture[17]	47.1	45.7	61.9	
Technicians/Associate professionals	3.6	3.7	2.4	
Mangers/Professionals	2.5	2.1	2.3	
Total	***2494***	***1391***	***1398***	
EDUCATION				
Never Attended School	33.9	33.9	65.9	56.3
Up-to Primary	18.1	20.5	15.6	20.5
Middle	15.9	16.3	7.4	8.7
Matriculation	18.1	17.1	7.4	9.6
Graduation	12.1	10.7	3	3.9
Post Graduate	1.8	1.4	0.6	0.6
Others	0.2	0.1	0.2	0.4
Total	***2508***	***1398***	***2508***	***1398***

[a] Elementary category includes armed forces also in which 2.9 percent sons and 0.2 percent fathers are employed respectively.

As regards education, the situation seems somewhat relaxing with the fact that only 33.9 percent of the sons (though a big number in absolute terms) never attended school as compared to 56.3 percent[18] from the father's generation suggesting improved status of school enrolments. The sons who completed the matriculation were 17.1 percent compared to 9.6 percent fathers; while 10.7 percent of the sons completed graduation (14 years of education in Pakistan) as against only 3.9 percent of the fathers. Table 2, in general, indicates a better education attainment for the sons' generation as compared to that of the fathers.

Transition Matrix

Educational Mobility

This section improves on the previous one as it provides results based on the son-father (son of the same father) relationship. The transition matrix details the "*chance opportunity open to each dynasty in the passage from one generation to the following*". The intergenerational educational, occupational and income mobility is reported in Tables 3, 4 and 5 respectively. The order of ranking is from 1st (lowest) to the last (highest).

[17] Clerks, Services, Skilled Agriculture Workers, Crafts and related and Operators.

[18] The number is 65.9 percent for over sample of fathers when no condition of working status is imposed. This figure may be an indicator of lower enrolments for the old generation of fathers as the fathers of age 89-105 years gets excluded under this condition.

Table 3

Son's Education against their Father's Education (%)

Full Sample	Education of Sons						
Education of Fathers	Never Attended School	Upto Primary	Middle	Matric	Graduation	Post Graduation	% (N)
Never Attended School	42.4	17.3	14.6	16.5	8.2	0.8	100 (1650)
Upto Primary	23.6	31.3	15.9	16.7	12.3	0.3	100 (390)
Middle	14.1	14.6	27.0	26.5	14.6	3.2	100 (185)
Matriculation	9.2	9.2	21.1	25.9	31.4	3.2	100 (185)
Graduation	12.0	2.7	6.7	24.0	36.0	18.7	100 (75)
Post Graduation	7.1	0.0	0.0	14.3	42.9	35.7	100 (14)
URBAN							
Never Attended School	42.2	19.3	13.3	14.7	9.1	1.4	100 (353)
Upto Primary	29.0	26.2	13.1	16.8	14.0	0.9	100 (107)
Middle	15.1	6.8	30.1	24.7	17.8	5.5	100 (73)
Matriculation	10.4	5.2	24.7	27.3	27.3	5.2	100 (77)
Graduation	13.3	4.4	8.9	28.9	22.2	22.2	100 (45)
Post Graduation[19]	33.3	0.0	0.0	0.0	33.3	33.3	100 (3)
RURAL							
Never Attended School	42.6	16.8	15.0	17.0	8.0	0.8	100 (1287)
Upto Primary	21.6	33.2	17.0	16.6	11.7	0.0	100 (283)
Middle	13.4	19.6	25.0	27.7	12.5	1.8	100 (112)
Matriculation	8.3	12.0	18.5	25.0	34.3	1.9	100 (108)
Graduation	10.0	0.0	3.3	16.7	56.7	13.3	100 (30)
Post Graduation	0.0	0.0	0.0	18.2	45.5	36.4	100 (11)

Table 3 (a)

Son's Education against their Father's Education by Cohort

Full Sample		*Education of Son (Less than 31 Years Aged Sons) (%)*						
Education of Fathers		Never Attended School	Upto Primary	Middle	Matric	Graduation	Post Graduation	% (N)
Never Attended School	<31	43.20	19.90	15.10	14.50	6.70	0.50	100 (1157)
	>31	40.80	11.40	13.60	21.10	11.80	1.40	100 (493)
Upto Primary	<31	26.10	30.30	17.30	14.70	11.40	0.30	100 (307)
	>31	14.50	34.90	10.80	24.10	15.70	0	100 (83)
Middle	<31	15.60	16.30	27.20	26.50	12.20	2	100 (147)
	>31	7.90	7.90	26.30	26.30	23.70	7.90	100 (38)
Matriculation	<31	7.90	9.30	24.50	22.50	31.80	4	100 (151)
	>31	14.70	8.80	5.90	41.20	29.40	0	100 (34)
Graduation	<31	13.30	3.30	6.70	25	35	16.70	100 (60)
	>31	6.70	0	6.70	20	40	26.70	100 (15)
Post	<31	0	0	0	9.10	54.50	36.40	100 (11)
Graduation	>31	33.30	0	0	33.30	0	33.30	100 (3)
URBAN								
Never Attended School		44.70	21.80	13.80	14.20	4.70	0.70	275
Upto Primary		31.20	26.90	12.90	16.10	11.80	1.10	93
RURAL								
Never Attended School		42.70	19.30	15.50	14.60	7.40	0.50	882
Upto Primary		23.80	31.80	19.20	14	11.20	0	214

[19]The results should be interpreted carefully because of extremely short sample size i.e. 3.

Table 4

Son's Occupation against their Father's Occupation (%)

Full Sample	Occupation of Sons				
Occupation of Fathers	Elementary	Services/ Agriculture	Technicians/ Associate Professionals	Mangers/ Professionals	**%** (N)
Elementary	71.6	25.8	1.1	1.5	100 (465)
Services/Agriculture	37.4	56.9	3.7	2.0	100 (860)
Technicians/Associate Professionals	47.1	38.2	14.7	0.0	100 (34)
Mangers/Professionals	15.6	40.6	28.1	15.6	100 (32)
		URBAN			
Elementary	64.8	31.0	2.1	2.1	100 (142)
Services/agriculture	26.8	65.9	5.0	2.3	100 (220)
Technicians/Associate Professionals	62.5	31.3	6.3	0.0	100 (16)
Mangers/Professionals	25.0	31.3	25.0	18.8	100 (16)
		RURAL			
Elementary	74.6	23.5	0.6	1.2	100 (323)
Services/Agriculture	41.1	53.8	3.3	1.9	100 (640)
Technicians/Associate Professionals	33.3	44.4	22.2	0.0	100 (18)
Mangers/Professionals	6.3	50.0	31.3	12.5	100 (16)

Table 4(a)

Son's Occupation against their Father's Occupation—
Less than 31 Years Aged Sons (%)

	Occupation of Sons				
Occupation of Fathers	Elementary	Services/ Agriculture	Technicians/ Associate professionals	Mangers/ Professionals	**% (N)**
Elementary	72.3	25.4	1.2	1.2	100 (422)
Services/Agriculture	38.8	55.8	3.3	2.1	100 (724)
Technicians/Associate Professionals	48.4	38.7	12.9	0.0	100 (31)
Mangers/Professionals	17.2	37.9	27.6	17.2	100 (29)
Elementary	64.9	31.3	2.2	1.5	100 (134)
Services/Agriculture	27.6	65.0	4.9	2.5	100 (203)
Technicians/Associate Professionals	66.7	33.3	0.0	0.0	100 (15)
Mangers/Professionals	26.7	33.3	20.0	20.0	100 (15)
Elementary	75.7	22.6	0.7	1.0	100 (288)
Services/Agriculture	43.2	52.2	2.7	1.9	100 (521)
Technicians/Associate Professionals	31.3	43.8	25.0	0.0	100 (16)
Mangers/Professionals	7.1	42.9	35.7	14.3	100 (14)

Table 4(b)

Son's Occupation against their Father's Occupation— Greater than 30 Years Aged Sons

	Occupation of Sons				
Occupation of Fathers	Elementary	Services/ Agriculture	Technicians/ Associate Professionals	Mangers/ Professionals	**% (N)[20]**
Elementary	72.3	25.4	1.2	1.2	100 (422)
Services/Agriculture	38.8	55.8	3.3	2.1	100 (724)
Technicians/Associate Professionals	48.4	38.7	12.9	0.0	100 (31)
Mangers/Professionals	17.2	37.9	27.6	17.2	100 (29)

Elementary category includes armed forces also in which 2.9 percent sons and 0.2 percent fathers are employed respectively.

Table 5

Income Quintile Transition Matrix (%)

Full Sample	Quintiles of Annual Incomes of Sons					
Quintiles of Annual Incomes of Fathers	1st Quintile	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile	% (N)
1st Quintile	43.5	25.3	16.6	8.1	6.5	100 (308)
2nd Quintile	31.3	33.8	17.9	11.7	5.4	100 (240)
3rd Quintile	20.7	30.4	22.1	16.7	10.1	100 (276)
4th Quintile	21.3	24.5	23.1	20.2	10.8	100 (277)
5th Quintile	18.5	14.0	18.5	26.0	23.0	100 (265)
RURAL						
1st Quintile	53.7	27.8	9.3	7.4	1.9	100 (54)
2nd Quintile	30.4	32.9	24.1	8.9	3.8	100 (79)
3rd Quintile	22.9	28.1	21.9	17.7	9.4	100 (96)
4th Quintile	22.4	37.8	21.4	16.3	2.0	100 (98)
5th Quintile	18.5	15.4	20.0	21.5	24.6	100 (65)
URBAN						
1st Quintile	41.3	24.8	18.1	8.3	7.5	100 (254)
2nd Quintile	31.7	34.2	14.9	13.0	6.2	100 (161)
3rd Quintile	19.4	31.7	22.2	16.1	10.6	100 (180)
4th Quintile	20.7	17.3	24.0	22.3	15.6	100 (179)
5th Quintile	18.5	13.5	18.0	27.5	22.5	100 (200)

Tables 3 and 3(a) provide information on the educational mobility from the fathers' generation to the sons'. A "Vicious circle trap" is very much visible from the table and there is high probability that the educational status of the father will pass on to the sons' generation. "Inheritance" seems to be playing an important role in determining the final educational attainment outcome. Those whose fathers never went to school have a 42.40 percent probability of never getting enrolled in their own generation. The probability of reaching to primary level for the sons of fathers

[20]The smaller sample size against occupation 3 and 4 (Table 4(b)) leaves us unable to undertake rural-urban analysis.

who never attended school is 17.3 percent while the probability of earning a post graduate degree is only 0.8 percent. The chances of the sons of remaining under primary and middle fade away as the father's education reaches to post graduation and the probability of earning at least graduation or higher degree is 78.6 percent. Interestingly, 7.10 percent of the sons of the post graduate fathers are likely to remain un-enrolled in school. This could be a data problem besides the smaller number of observations. The probability of acquiring the highest degree increases along with the increase in inherited educational status of the father as is evident from the 2nd last column of table 3. Similar results were observed when the sample was split into rural-urban stratum. These results show the intergenerational persistence of educational attainment and lack of equal opportunities in education. This may, partly, be an outcome of different educational systems prevailing in Pakistan. Another probable reason might be poverty driven "earning hand" concept leaving the majority of sons of uneducated fathers uneducated or unable to reach higher levels of education.

Table 3(a) furnishes the educational transition matrix for the cohort of sons with ages <31 and ≥31 years respectively. The results are indicative that ultimately the probability of the sons meeting the same fate as that of their fathers is higher for cohorts in age ≥ 31 years. The probability of attaining the highest degree for a son, having a father who never attended school, is as low as 0.5 percent. A son, older than 31 years of age, whose father has primary education has a 30.30 percent probability of reaching to the primary level while the probability that he remains un-enrolled in school is 26.1 percent; while the sons in cohort <31 years of age, with the fathers having primary education, are 34.90 percent likely to reach to the same level of education; their chances of never attending school are 14.50 percent however, which is much lower for the son with the same background but falling in cohort ≥31 years of age, indicating higher enrollment for children born after 1980.[21] Similar patterns of persistence are observed for both cohorts for all categories of education. It may be added that inferences regarding the vintage effect are difficult to be traced from a one-year cross-sectional data. This study however suggests that despite the rise in educational enrollments, a father in the poverty ridden elementary occupation could not get his son to have a perceptible upward mobility in education.

Occupational Mobility

Occupational mobility, which is classified somewhat differently than Labour Force Survey (LFS), from one generation to the following is depicted in Tables 4 and 4(a) respectively where the latter provides the transition probabilities against different cohorts of sons with the same back ground. The number 1-4, in column and rows, ranks the occupations in increasing order and

[21]Any child of 30 years of age or younger in 2010 must be born 1980 or thereafter.

4 is preferred over 1.[22] The "In the name of father" situation is evident from the results and there is 71.60 percent probability that sons of fathers working in elementary occupation will end up with the same fate while the probability of their reaching to higher professions declines with the order of the occupation and falls to 1.5 percent for the highest ranked occupations, indicating that a son born to a father working in elementary sector has only 1.5 percent probability to be a manager or a professional.

The sons of fathers working in the services or agriculture sector (occupation ranked as 2) have a probability of 56.9 percent to fall in the same occupation. But more importantly, these sons have a probability of 37.4 percent of falling into a profession lower than their fathers. A similar situation is observed for the sons whose fathers were technicians and associate professionals (occupation 3) where the probability for these sons to reach to the same occupational status is only 14.7 percent, while the probability that these sons end up joining occupations lower than their fathers' is 85.30 percent.

Floor and ceiling effects, a potential disadvantage of the transition matrix, suggest that the movement below and above the bottom and top groups respectively are not possible so the middle groups portray a good picture of the intergenerational mobility. For the sons of the fathers who are managers and professional (the highest ranked occupation, 4), the probability to reach to the same profession is only 15.6 percent while the probabilities of their falling in occupation 1, 2 and 3 (lower than their father's occupational status) are 15.60 percent, 40.60 percent and 20.10 percent respectively. These figures suggest an alarming situation of regression in occupational status where thesons' generation is falling behind their fathers. This may be a reflection partly of the ceiling effect but seems to be primarily emerging from the ongoing meltdown in the labour market of the country characterised by excessive labour supply due to high level of population growth and poor performance of the economy on the labour demand side. Similar patterns are observed for rural and urban samples and the cohort of sons with ages <30 and >30 years respectively.

Income Mobility

Table 5, based on income quintiles, draws the information about probability of moving from one income group to the other group where 1 stands for the lowest income group (poorest) while 5 indicates the highest income group (richest).[23] The probability for a son to move to the highest quintile from

[22]This classification, though not common in Pakistan, is adopted purposefully to get somewhat concise picture of intergenerational occupational mobility where the reader can make easy comparisons.

[23]Pakistan Demographic and Health Survey (PDHS) 2006-07, though based on wealth rather than income, titles these quintiles as poorest, poor, middle, rich and richest ranked from 1-5 respectively.

the lowest one is only 6.5 percent while the probability of retaining the economic status equal to that of the father's is 43.5 percent, given that the father falls in the 1st quintile. The sons born to fathers belonging to the middle income group (quintile 3) have a 10.1 percent probability to reach to the top quintile. As is obvious from the 2nd last column of Table 5, the probability of reaching to higher income groups for a son is a positive function of the economic status of his father.

Born to fathers at the tail end of income distribution sons are more likely to be at the tail end of income distribution of their own generation. In the rural sample the persistence is high with the probability of 53.7 percent sons falling in the lowest income quintile, given the fact that their fathers were in the same quintile. More importantly, the probability of reaching to the highest quintile from the lowest is 1.9 percent for a son born in rural Pakistan as compared to 7.5 percent to the son born in an urban area, which is suggestive of comparatively better opportunities available in urban areas.

Regression Analysis

The vulnerability of the transition matrix analysis of intergenerational mobility to floor and ceiling effect has led to regression analysis. Starting from a simple linear regression, we incorporate non-linearity involved in the analysis. Further, the instrumental variable approach is employed to tackle the potential endogeneity stemming from correlation between the father's income and the error term[24]. Sensitivity analysis is adopted wherein the base model is run by regressing the sons' log income on the log income of their father only and then, in the second step, the nexus is controlled for other characteristics of the son and the father. Regression analysis is also undertaken for rural and urban samples and for different cohorts of sons separately and the results are reported in Tables 6 and 7.[25]

Table 6 details the Ordinary Least Square (OLS) regression estimates against the fathers' reported and estimated income.[26] The first column of Table 6, reporting the estimates against the fathers reported income, shows that the father's income, without any other controls, has a positive and statistically significant impact on the son's income. The results are suggestive that, in Pakistan, slightly more than one quarter (0.269) of economic advantage of the fathers passes on to the sons. The pass on ratio falls down to one-fifth (0.207) when the relation is controlled for the sons' own education, age and age square.

---

[24]As discussed in section on methodology.

[25]Smaller sample for provinces, especially Balochistan limits the analysis only to rural-urban clusters.

[26]Income of father adjusted for age, occupation and education of father as given in Equation (8) in methodology section.

Table 6

Table 6

Ordinary Least Square Estimates of Son's Income

	Reported Income						Estimated Income[+]					
	Full Sample		Urban		Rural		Full Sample		Urban		Rural	
Indicators	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2
Father's log income	0.269 ***	0.207 ***	0.393 ***	0.257 ***	0.244 ***	0.199 ***	0.330 ***	0.166	0.293 *	–0.172	0.378 ***	0.310 **
	(0.029)	(0.027)	(0.062)	(0.058)	(0.034)	(0.031)	(0.105)	(0.103)	(0.171)	(0.187)	(0.134)	(0.131)
Age of son		0.238 ***		0.265 ***		0.245 ***		0.239 ***		0.266 ***		0.243 ***
		(0.018)		(0.038)		(0.021)		(0.018)		(0.039)		(0.021)
Age square of son		–0.003 ***		–0.004 ***		–0.003 ***		–0.003 ***		–0.004 ***		–0.003 ***
		(0.000)		(0.001)		(0.000)		(0.000)		(0.001)		(0.000)
Education of son		0.010 *		0.017 *		0.006		0.015 **		0.030 ***		0.008
		(0.006)		(0.010)		(0.007)		(0.006)		(0.010)		(0.007)
Occupation of son		0.070 *		0.087		0.058		0.078 **		0.126 **		0.052
		(0.038)		(0.061)		(0.048)		(0.039)		(0.063)		(0.049)
Province		0.087 ***		0.130 ***		0.073 **		0.135 ***		0.165 ***		0.124 ***
		(0.026)		(0.042)		(0.032)		(0.025)		(0.043)		(0.031)
Age of father		0.007 **		0.007		0.006 *						
		(0.003)		(0.005)		(0.004)						
Constant	7.899 ***	4.341 ***	6.460 ***	3.537 ***	8.194	4.365 ***	7.221 ***	4.971 ***	7.586 ***	8.456 ***	6.702 ***	3.306 **
Prob.(F-statistics)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.087	0.000	0.005	0.000
Adjusted R-Square	0.058	0.296	0.092	0.316	0.050	0.292	0.006	0.269	0.005	0.282	0.007	0.271
Total	***1366***	***1358***	***392***	***392***	***974***	***966***	***1393***	***1385***	***392***	***392***	***1001***	***993***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.

In parenthesis are reported standard errors.

[+]Estimated Income of Father = Constant +Father's Age+Father's Education+Father's Age^2 +Father's Occupation.

The results, after decomposing the estimation into rural (N=974) and urban (N=392) samples are suggestive of the higher persistence in urban areas (column 2 Table 6) where 40 percent (0.394) of the earnings are determined by the economic status of the father when no controls are added in the regression while this share declines to 25 percent after adding the control variables. The coefficient of the father's log income in the rural sample is somewhat similar to that of the full sample.

The last half of Table 6 reports regression estimates against estimated log income of the father which is adjusted for his age, occupation and education. Broadly speaking, the reported income of the father indicates the economic status while the estimated income is a combined indicator of the socio-economic status of the father. The β in reported income is different from that against estimated income as the latter explains the variation in the son's income adjusted for age, education and father's occupation. The results are indicative that against one unit increase in the father's estimated income, the son's income increases by 0.33 percent as compared to 0.269 in case of reported income which is suggestive that the intergenerational mobility also depends, to some extent, on the age, occupation and educational status of the fathers' generation, which may connote the social status of the father too. Interestingly, however, the pass on ratio of the fathers' status to the son's income, falls by a half when the son's own age, education and occupation are introduced, implying that the extent of intergenerational mobility estimates is also sensitive to the education and cohort of the sons' generation.[27] The coefficient for the father's log estimated income is higher (0.378) for the rural sample (0.293 for urban sample) indicating relatively lower intergenerational income mobility in rural areas when both the social and economic status of the father is accounted for. Sons born in rural areas will inherit most of their economic status from their fathers and their own characteristics have not much to add as is evident from a very marginal decline in the coefficient of the father's log estimated income in the rural sample when controls are added (from 0.378 to 0.310). The negative sign on the coefficient of the fathers' log income, though insignificant statistically, indicates that the sons, in their own generation, are lower in economic status than their fathers were in their generation.

The age of sons has statistical significance in all regressions and the value of the coefficient varies between 0.239-0.266 indicating that age is a significant determinant of the intergenerational mobility estimates.[28] The square of the age of the son carries a negative sign across the specifications and is significant at 1 percent level suggesting the non-linear nature of

[27]It may however be kept in mind that education of son itself is an outcome of fathers economic and educational position.

[28]Suggesting cohort analysis of intergenerational mobility.

income-age relationship, implying a fall in income against increased age after a certain limit. The son's education and occupation register mixed result across the specifications but retain positive value with smaller coefficients leading us to conclude that in Pakistan a bulk of income of the son's generation depends on the economic position of the previous generation which means lower mobility. The results confirm and highlight the ground situation of the country where the poor are poor because they were born poor. The provincial background determines the income of the son's generation significantly pointing towards different dynamics embodied in the social set up of the respondents. The adjusted R^2 for specifications with controls included the ranges between 0.269-0.316 across the specifications given in Table 6. Further the probability of F-statistic in all cases is <0.001 across the regression models as reported in the bottom row of Table 6.

Cohort Analysis

Life earnings are sensitive to the point of time (age of father and son) at which these earnings are observed. This presumed heterogeneity of earnings' growth across the age groups may lead to different levels of intergenerational mobility trends. The intergenerational mobility estimates are conceived to be downward biased for young sons and old fathers [Grawe (2006); Reville (1995)]. This work, building on the life cycle bias hypothesis, undertakes cohort analysis and performs regressions analysis for all sons (greater than 21 years of age), sons of age 25-39 and 30-50 years of age. Cohort analysis based on the results from Table 6 is undertaken. Table 7 reports the OLS estimates for sons who are older than 20 years, 25-39, and 30-50 years of age. The cutoff point of 20 years is imposed to preclude the potential inclusion of sons who are involved in studies. Also the income reported at lower ages is not truly repetitive of lifelong earnings.

A continuous decline for the coefficient of log income of fathers is observed along the cohort and the higher the age of the son at which income is observed, the lower the persistence. Conversely, higher intergenerational income mobility is recorded when the earnings are observed at the later stages of life confirming the life cycle bias. Slightly more than one tenth (0.113) of the economic status of fathers is passed on to the sons when income is observed at the age between 30-50 years (later stages of life) as compared to one-fifth when the lower age limit is relaxed to 21 years, suggesting that immobility is higher for sons observed in early stages of life. For a cohort of sons at least 21 years old, the persistence is higher (0.381) in urban areas as compared to those born in rural areas (0.179). Model 2 in Table 7, reports the OLS estimates when the controls are added to control the son-father income status nexus exhibiting similar patterns, but with lower values of the coefficient for the fathers' log income.

Table 7

Models 3 and 4 in Table 7 detail the regression estimates for intergenerational mobility when the reported income of the father is replaced with his estimated income for the cohorts as mentioned above. The father's socio-economic status (income of father adjusted for age, education and occupation) becomes an insignificant predictor of the son's income when the earnings are observed at a point of time when the son's age is between 30-50 years (column 4 Table 9). Opposite patterns of mobility are observed for rural and urban samples with and without age restrictions on the son. Excluding sons younger than 21 years of age, a higher immobility (0.391) is observed for sons residing in urban areas, while it is the other way round when no age brackets are imposed. In this case immobility is higher (0.378) in the rural sample as compared to 0.239 for sons residing in urban areas. When the son-father income nexus is controlled for the characteristics of the son, lower values of pass on ratio of the father's economic status are observed.

Instrumental Variable Estimations

To tackle the perceived endogeneity of the variables, the intergenerational income mobility was estimated by employing Two Stages Least Square (2SLS). Its results are reported in Table 8.[30] The father's education and occupation are used as instruments for the father's income. The 2SLS estimates are undertaken only for the reported income of the father as instrumenting the fathers income by education and occupation is very much similar to the OLS estimates based on the estimated income of the father. The results confirm the argument that OLS estimates of intergenerational mobility, by construction, are downward biased as is evident from Table 8.

Table 8

Two Stage Least Square Regression Estimates

			Cohort Analysis			>20 Years	
Models	Independent Variables		>20	25-39	30-50	Urban	Rural
1	Father's Log	β	0.438 ***	0.408 ***	0.383	0.404 **	0.459 ***
	Income	(S.E)	(0.108)	(0.125)	(0.237)	(0.202)	(0.128)
		Prob (F)	0.000	0.001	0.107	0.000	0.000
		N	***921***	***550***	***247***	***227***	***694***
2	Fathers Log	β	0.467 ***	0.418	0.531 ***	0.508 **	0.461 ***
	income,	(S.E)	(0.126)	(0.298)	(0.168)	(0.219)	(0.160)
	education of	Prob (F)	0.000	0.126	0.000	0.004	0.000
	son, age of son	*N*	***921***	***247***	***550***	***227***	***694***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.
In parenthesis are reported standard errors.

[30]Detailed results are available in Appendix V. and VI.

The coefficients for the father's log income are consistently higher for all cohorts of the sons both with and without controls. Interestingly, when controls are added, the highest of the coefficients turn out for the father's log income as is obvious from model 2 of Table 10 where, at least, nearly half of the economic status of the son is governed by the economic position of the father. The highest value is observed when the son's income is observed at the later stages of life (30-50 years). These results confirm the downward bias of OLS estimates and suggest that the complexities of the intergenerational mobility, if ignored, can give erroneous estimates by producing lower elasticity estimates of intergenerational mobility.

V. CONCLUDING REMARKS

Drawing inference from intergenerational mobility, involving a complex interaction of processes, based on estimates generated from a single cross-section of data, can be misleading. Nonetheless, some findings emerge from this study. First and foremost, despite all controls, the father's socio-economic status remains the most crucial determinant of the economic position of the son[31]. The rich are rich because they are born rich while the fate of the poor by birth is to stay poor. The inheritance burden is not easy to get rid of.. A plausible explanation can be the lower investment in education on the one hand while, on the other hand, the poor father seems unable to buy good quality education available to the rich in private sector schools and failure of the public sector to provide quality education. In addition, job allocation, to the extent it is driven by considerations emanating from constituency built up could be a major impediment to intergenerational mobility because the poor have no influence. Further, the mounting population pressure generating mass labour supply and resultant unemployment poses a major challenge to a economically stagnating country like Pakistan. The regression analysis of this study, to some extent, seems to indicate that the situation in Pakistan is very similar to Latin American countries wherein a high intergenerational persistence is documented. It is worth reminding, however, that the analysis of this study is confined only to wage earners wherein unavailability of data precludes the inclusion of the self employed segment of the working class. It is imperative to highlight that data limitations as discussed in the paper must be kept in view while interpreting the results.

[31]Saima and Sajid (2011) provides evidence on non-inclusiveness of economic growth and inequalities of opportunities in education and employment sector of Pakistan over a period of 1990-2008.

APPENDIX-I

Variables

Annual Income: Annual income, the continuous variable, is constructed by information reported in Section 3 (employment) and is a sum of all types of income. The log income of the son is used as a dependent variable in regression analysis.

Age: The completed years of age as reported by the respondents at the time of interview makes the variable "age". **The** age of the sons and fathers is categorised separately into different categories based on minimum and maximum values and the frequency distribution against each category. The son's age is recoded into 9 categories, as those having 14 years fall at the most in the less than 15 years' category. Those who are older than 14 years are grouped together in to 8 distinct groups of 5 years' interval. Similarly, the fathers having the age of up to 34 years are categorised into less than 35, and those having more than 34 are grouped together into 8 distinct groups of 5 years interval.

Education: The completed years of education**,** excluding all information on school going individuals, originally consisting of 16 discrete and 6 nominal categories, is recoded into 6 categories. Those who have no education are defined as *never attended school*; those who have availed 1 to 5 years of schooling as *up-to primary*, 6 to 8 as *middle*, 9 to 10 years as *matriculation*, up to 14 as *graduation* and those who have education equivalent to at least 15 years of schooling are categorised as *post graduates*.

Occupation: The respondent was asked about the type of profession he/she is employed at the time of interview. Initially, occupation of respondent is coded into 10 different categories according to the nature and type of profession and then it is further recoded into 4 major categories to be used in descriptive analysis and transition matrices.

These variables along with their categorical coding are illustrated below

Variable	Coding Categories
Age (Son)	(1)Less than 15, (2)15-19, (3)20-24, (4)25-29, (5)30-34, (6)35-39, (7)40-44, (8)45-49 & (9)50 and above.
Age (Father)	(1) Less than 35, (2)35-40, (3)41-45, (4)46-50, (5)51-55, (6)56-60, (7)61-65, (8)66-70 & (9)71 and above.
Education	(0)Never attended school, (1)Up-to Primary, (2)Middle, (3)Matriculation, (4)Graduation *, (5)Post-Graduation**
Occupation (original coding)	(1)Armed Forces, (2)Professionals, (3)Managers, (4)Technical and Associate Professionals, (5)Clerks, (6)Services, (7)Skilled Agri-Workers, (8)Crafts and Related, (9)Operators & (10)Elementary
Occupation-2 (recoded)	(1)Armed Forces/Elementary, (2) Clerks/Services/Skilled Agri-workers/ Crafts and Related/ Operators, (3)Technical and Associate Professionals & (4)Managers/ Professionals

** Also includes poly-technique, FA, CT, BA and B.Ed; ** including Post graduate MA, M.Sc., M.Ed., Engineering, Medical and Degree in Law.*

APPENDEX-II

DESCRIPTIVE ANALYSIS

This appendix details the information on age, education and income of fathers and sons. The unit of analysis is working fathers and sons reporting positive income. The age limit (> 20 years) for sons' sample was put to exclude sons who were still studying. The mean age of the fathers is 54.81 years while that of the sons is 30.07 years. The minimum age for the fathers was observed to be 25 years while the maximum age of 88 and 80 years were registered for father and sons respectively.

DESCRIPTIVE STATISTICS

Working Fathers Reporting Positive Income					
Fathers	Mean	Min	Max	St.dev	N
Full Sample					
Age	54.81	25.00	88.00	9.71	1367.00
Education	3.07	0.00	16.00	4.02	1362.00
Annual Income	116881.45	11.00	3070000.00	175955.00	1367.00
Urban Sample					
Age	53.19	27.00	76.00	8.71	393.00
Education	4.19	0.00	16.00	4.39	391.00
Annual Income	104098.73	11.00	967152.00	105101.00	393.00
Rural Sample					
Age	55.46	25.00	88.00	10.02	974.00
Education	2.61	0.00	16.00	3.77	971.00
Annual Income	122039.16	132.00	3070000.00	197287.00	974.00
Punjab					
Age	54.27	28.00	88.00	9.53	659.00
Education	3.24	0.00	16.00	4.02	655.00
Annual Income	101561.16	11.00	3070000.00	180782.00	659.00
Sindh					
Age	54.27	25.00	79.00	10.11	388.00
Education	2.90	0.00	16.00	3.58	388.00
Annual Income	104048.53	132.00	1872500.00	165343.00	388.00
KPK					
Age	56.46	34.00	81.00	9.00	211.00
Education	3.69	0.00	16.00	4.73	211.00
Annual Income	167763.03	7000.00	1000000.00	145365.00	211.00
Balochistan					
Age	56.75	38.00	82.00	10.26	109.00
Education	1.41	0.00	16.00	3.59	108.00
Annual Income	156690.86	10000.00	1296000.00	211513.00	109.00
Sons>21 Years Reporting Positive Income					
Full Sample					
Age	30.07	21.00	80.00	7.72	1900.00
Education	6.28	0.00	16.00	4.85	1896.00
Annual Income	134943.60	5.00	4200000.00	210265.00	1900.00

Continued—

Appendix-II—(*Continued*)

Urban Sample					
Age	28.66	21.00	62.00	6.77	460.00
Education	7.11	0.00	16.00	5.03	457.00
Annual Income	126564.61	5.00	4200000.00	247584.00	460.00
Rural Sample					
Age	30.52	21.00	80.00	7.95	1440.00
Education	6.02	0.00	16.00	4.76	1439.00
Annual Income	137620.23	2000.00	2200000.00	196882.00	1440.00
Punjab					
Age	29.92	21.00	64.00	8.07	722.00
Education	6.27	0.00	16.00	4.45	719.00
Annual Income	128885.22	5.00	2200000.00	205599.00	722.00
Sindh					
Age	30.01	21.00	80.00	7.74	500.00
Education	5.07	0.00	16.00	4.87	500.00
Annual Income	111179.38	2400.00	4200000.00	254622.00	500.00
KPK					
Age	30.42	21.00	59.00	7.44	525.00
Education	8.08	0.00	16.00	4.64	524.00
Annual Income	161022.04	6000.00	1560000.00	147971.00	525.00
Balochistan					
Age	29.74	21.00	57.00	6.91	153.00
Education	4.20	0.00	16.00	5.23	153.00
Annual Income	151708.87	10000.00	2400000.00	242613.00	153.00

It is important to note that the maximum age reported for the father was 105 years under no restriction but limiting the sample to fathers who are currently working gave 88 years as the maximum age for fathers. The condition of "working fathers' was set as the reported income was to be used in analysis for which both fathers and sons must be working at the time of survey. No major differences were observed for the mean age of the father across the provinces of Pakistan, but the minimum age of fathers varied across the provinces and was 38 years for fathers residing in Balochistan. Similar variations for maximum age were observed for sons across the sample.

The minimum average education of 1.41 years is observed for fathers residing in Balochistan. A clear divide is visible in rural and urban areas where fathers have an average education of 2.61 and 4.19 years respectively. Following the fathers, sons residing in Balochistan recorded a minimum (4.21) average educational years while the situation is, though surprisingly, much better in KPK where the sons' generation has, on average, 8.08 years education. The rural urban divide, in the son's generation, seems to be minimised and no major differences in educational years are observed. Sons earn, on average, more than the father as is evident from the mean incomes. But interestingly, the sons' generation in KPK and Balochistan, though the difference is negligible, earns less than the earnings of the fathers. Fathers belonging to Punjab and sons belonging to Sindh reported the highest amount of annual earnings respectively. A detailed analysis of earnings will be offered in the next section of this paper.

APPENDIX-III

Ordinary Least Square Estimates of Son's Log Income

	Reported						Estimated					
	Full Sample		Urban		Rural		Full Sample		Urban		Rural	
Indicators	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2
Father's Log Income	0.209 ***	0.180 ***	0.381 ***	0.288 ***	0.179 ***	0.163 ***	0.298 ***	0.271 **	0.391 ***	0.048	0.276 ***	0.347 ***
	(0.028)	(0.029)	(0.064)	(0.068)	(0.031)	(0.033)	(0.098)	(0.111)	(0.183)	(0.211)	(0.119)	(0.134)
Age of Son		0.062 *		–0.007		0.081 **		0.057 *		0.001		0.073
		(0.032)		(0.083)		(0.036)		(0.032)		(0.088)		(0.036)
Age Square of Son		–0.001		0.0001		–0.001 *		–0.001		0.0001		–0.001
		(0.000)		(0.001)		(0.001)		(0.000)		(0.001)		(0.001)
Education of Son		0.019 ***		0.025 **		0.015 **		0.0991 ***		0.033 **		0.015 **
		(0.006)		(0.011)		(0.007)		(0.007)		(0.013)		(0.008)
Occupation of Son		0.090 **		0.193 ***		0.047		0.088 **		0.224 ***		0.033
		(0.040)		(0.069)		(0.050)		(0.042)		(0.073)		(0.051)
Province		0.070 **		0.043		0.076 **		0.123 ***		0.103 *		0.129 ***
		(0.028)		(0.051)		(0.034)		(0.028)		(0.053)		(0.033)
Age of Father		0.005		0.009		0.003						
		(0.003)		(0.007)		(0.004)						
Constant	8.826 ***	7.325 ***	6.869 ***	6.932 ***	9.175 ***	7.334 ***	6.884 ***	6.478 ***	6.767 ***	9.726	8.009 ***	5.426 ***
Prob (F-statistics)	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.033	0.000	0.021	0.000
Adjusted R-Square	0.058	0.111	0.134	0.195	0.045	0.092	0.009	0.078	0.016	0.122	0.006	0.070
N	***892***	***884***	***225***	***225***	***667***	***659***	***917***	***909***	***225***	***225***	***692***	***684***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.

In parenthesis are reported standard errors.

Estimated Income of Father = Constant +Father's Age+Father's Education+Father's Age^2 +Father's Occupation.

APPENDEX-IV

Ordinary Least Square Estimates of Son's Log Income

	Reported				Indicators			
	25–39		30–50		25–39		30–50	
Indicators	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2
Father's Log Income	0.178 ***	0.133 ***	0.113 **	0.100 *	0.089 ***	0.282 **	0.155	–0.009
	(0.033)	(0.035)	(0.052)	(0.052)	(0.011)	(0.141)	(0.182)	(0.197)
Age of Son		–0.174		0.066		–0.180		–0.019
		(0.157)		(0.178)		(0.153)		(0.171)
Age Square of Son		0.003		–0.001		0.003		0.001
		(0.003)		(0.002)		(0.003)		(0.002)
Education of Son		0.024 ***		0.027 **		0.022 ***		0.028 **
		(0.008)		(0.012)		(0.008)		(0.012)
Occupation of Son		0.094 *		0.265 ***		0.089 *		0.286 ***
		(0.051)		(0.086)		(0.053)		(0.088)
Province		0.098 ***		0.081		0.138 ***		0.104 **
		(0.037)		(0.058)		(0.036)		(0.056)
Age of Father		0.003		0.011				
		(0.005)		(0.007)				
Constant	9.262 ***	11.658 ***	10.030 ***	7.349 **	10.223 ***	10.136 ***	9.575 ***	10.507 ***
Prob(F-statistics)	0.000	0.000	0.030	0.000	0.000	0.000	0.394	0.000
Adjusted R-Square		0.086		0.097		0.064		0.086
N	***533***	***529***	***236***	***234***	***530***	***543***	***245***	***243***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.

In parenthesis are reported standard errors.

Estimated Income of Father = Constant +Father's Age+Father's Education+Father's Age^2 +Father's Occupation.

APPENDEX-V

Two Stage Least Square Estimates of Son's Log Income

	No Age Restrictions						Greater Than 20 Years Old Sons					
	Full Sample		Urban		Rural		Full Sample		Urban		Rural	
Indicators	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2	M-1	M-2
Father's Log Income	0.575 ***	0.699 ***	0.394	0.890 ***	0.672 ***	0.632 ***	0.438 ***	0.467 ***	0.404 **	0.508 **	0.459 ***	0.461 ***
	(0.123)	(0.137)	(0.255)	(0.287)	(0.144)	(0.158)	(0.108)	(0.126)	(0.202)	(0.219)	(0.128)	(0.16)
Age of Son		0.085***		0.080 ***		0.084 ***		0.045 ***		0.034		0.047 ***
		(0.01)		(0.02)		(0.013)		(0.012)		(0.023)		(0.015)
Education of Son		–0.040 *		–0.070 **		–0.026		0.005		–0.005		0.007
		(0.024)		(0.034)		(0.033)		(0.021)		(0.028)		(0.03)
Constant	4.470	1.262	6.443	–0.548	3.407	1.923	6.245 ***	4.661 ***	6.608 ***	4.582 *	0.017 ***	4.641 **
Prob(F-statistics)	0.000	0.000	0.122	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000
R-Square	0.016	0.085	0.006	0.076	0.022	0.093	0.018	0.044	0.018	0.058	0.019	0.041
N	***1398***	***1398***	***394***	***394***	***1004***	***1004***	***921***	***921***	***227***	***227***	***694***	***694***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.

In parenthesis are reported standard errors.

APPENDEX-VI

Two Stage Least Square Estimates of Son's Log Income

Indicators		Cohort Analysis		
		30–50	25–39	
Father's Log Income	0.383	0.418	0.408 ***	0.531 ***
	(0.237)	(0.298)	(0.125)	(0.168)
Age of Son		0.105 *		0.075
		(0.053)		(0.051)
Education of Son		0.024		–0.004
		(0.063)		(0.026)
Constant	7.012 ***	2.841	6.669 ***	3.136
Prob(F-statistics)	0.107	0.126	0.001	0.000
R-Square	0.011	0.024	0.020	0.039
N	***247***	***247***	***550***	***550***

*; **; *** stand for significant at 10 percent, 5 percent and 1 percent respectively.

In parenthesis are reported standard errors.

REFERENCES

Aronson, Daniel and Bhashkar Mazumder (2008) Intergenerational Economic Mobility in the United States, 1940 to 2000. *Journal of Human Resources* 43:1,139–172.

Asghar, Saima and Sajid Amin Javed (2011) On Measuring Inclusiveness of Growth in Pakistan. *The Pakistan Development Review* (forthcoming)

Behrman, Jere and Paul Taubman (1985) Intergenerational Earnings Mobility in the United States: Some Estimates and a Test of Becker's Intergenerational Endowments Model. *Review of Economics and Statistics* 67:1, 144–151.

Bielby, W. T. and R. M. Hauser (1977) Response Error in Earnings Functions for Nonblack Males. *Sociological Methods and Research* 6, 241–280.

Björklund, Anders and Jäntti, Markus (1997) Intergenerational Income Mobility in Sweden Compared to the United States. *American Economic Review* 87:5, 1009–1018.

Björklund, Anders and Markus Jäntti (2009) Intergenerational Income Mobility and the Role of Family Background. In Wiemer Salverda, Brian Nolan, and Tim Smeeding (eds) *Handbook of Economic Inequality*. Oxford: Oxford University Press.

Black, Sandra E. and Paul J. Devereux (2010) Recent Developments in Intergenerational Mobility. (Discussion Paper Series // Forschungsinstitut zur Zukunft der Arbeit, No. 4866, (http://hdl.handle.net/10419/36911).

Blanden, Jo (2009) How Much can we Learn from International Comparisons of Intergenerational Mobility? Paper No. CEEDP0111 (Centre for the Economics of Education, LSE).

Bratsberg, Bernt, Knut Røed, Oddbjorn Raaum, Robin. A. Naylor, Jäntti Markus, Eriksson and Eva Österbacka (2007) Nonlinearities in Intergenerational Earnings Mobility: Consequences for Cross-country Comparisons. *Economic Journal* 117, C72-92.

Burney, A. Nadeem and Mohammad Irfan (1991) Parental Characteristics, Supply of Schools, and Child School-enrolment in Pakistan. *The Pakistan Development Review* 30:1, 21–62.

Corak, Miles (2006) Do Poor Children become Poor Adults? Lessons from a Cross Country Comparison of Generational Earnings Mobility. In John Creedy and Guyonne Kalb (ed.) *Research on Economic Inequality*. Vol. XIII (Amsterdam) pp. 143–188.

Corak, Miles and Andrew Heisz (1999) The Intergenerational Earnings and Income Mobility of Canadian Men. *Journal of Human Resources* 34, 504–533.

Davies, James, Jie Zhang, and Jinli Zeng (2005) Intergenerational Mobility under Private vs. Public Education. *Scandinavian Journal of Economics* 107, 399–417.

Dearden, Lorraine, Stephen Machin, and Howard Reed (1997) Intergenerational Mobility in Britain. *Economic Journal* 107:440, 47–66.

Dunn, Christopher E. (2007) The Intergenerational Transmission of Lifetime Earnings: Evidence from Brazil. *The B.E. Journal of Economic Analysis and Policy* 7:2 (Contributions) Art. 2.

Grawe, Nathan D. (2004) Reconsidering the Use of Nonlinearities in Intergenerational Earnings Mobility as a Test for Credit Constraints. *Journal of Human Resources* 39, 813–827.

Grawe, Nathan D. (2006) The Extent of Lifecycle Bias in Estimates of Intergenerational Earnings Persistence. *Labour Economics* 13, 551–570.

Grawe, Nathan D. and Casey Mulligan (2002) Economic Interpretations of Intergenerational Correlations. *Journal of Economic Perspectives* 6, 45–58.

Haider, Steven J. and Gary Solon (2006) Life-cycle Variation in the Association between Current and Lifetime Earnings. *American Economic Review* 96, 1308–1320.

Han, Song and Casey Mulligan (2001) Human Capital, Heterogeneity, and Estimated Degrees of Intergenerational Mobility. *Economic Journal* 111, 207–243.

Havinga, Ivo C., Faiz Mohammad and Suleman I. Cohen (1986) Intergenerational Mobility and Long Term Socio-economic Change in Pakistan. *The Pakistan Development Review* 25:4.

Ichino, Andrea, Loukas Karabarbounis, and Enrico Moretti (2009) The Political Economy of Intergenerational Income Mobility. (Institute for the Study of Labour (IZA), Bonn). (Discussion Paper No. 4767).

I-Hsin Li (2011) Intergenerational Income Mobility in Taiwan. [www.wise.xmu.edu.cn/ labor2011 /papers/I-Hsin%20Li.pdf].

Jäntti, Markus, Bernt Bratsberg, Knut Røed, Oddbjørn Raaum, Robin Naylor, Österbacka, Eva, Björklund Anders and Tor Eriksson (2006) American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States. (Institute for the Study of Labour (IZA), Bonn). (Discussion Paper No. 1938)

Khan, Shahrukh Rafi and Muhammad Irfan (1985) Rate of Return to Education and the Determinants of Earnings in Paksiatn. *The Pakistan Development Review* 24: 3 &4, 671–683.

Lefranc, Arnaud and Alain Trannoy (2005) Intergenerational Earnings Mobility in France: Is France more Mobile than the US? Annales d'Economie et de Statistique 78, 57–77.

Leigh, Andrew (2007) Intergenerational Mobility in Australia. *The B.E. Journal of Economic Analysis and Policy* 7, Article 6.

Lillard, Lee A. and M. Rebecca Kilburn (1995) Intergenerational Earnings Links: Sons and Daughters. Unpublished.

Mazumder, Bhashkar (2005) Fortunate Sons: New Estimates of Intergenerational Mobility in the U.S. Using Social Security Earnings Data. *Review of Economics and Statistics* 87, 235–255.

Mocetti, Sauro (2007) Intergenerational Earnings Mobility in Italy. *The B.E. Journal of Economic Analysis and Policy* 7, Article 5.

Mulligan, Casey B. (1997) *Parental Priorities and Economic Inequality*. Chicago: University of Chicago Press.

Nayab and G. M. Arif (2012) Pakistan Panel Household Survey: Sample Size, Attrition and Socio-demographic Dynamics. Pakistan Institute of Development Economics, Islamabad. (*Poverty and Social Dynamics Paper Series*, PSDPS-1).

Nicoletti, Cheti and John Ermisch (2007) Intergenerational Earnings Mobility: Changes across Cohorts in Britain. *The B.E. Journal of Economic Analysis and Policy* 7, Article 9.

Nilsen, Oivind A., Kjell Vaage, Arild Arkvik and Karl Jacobsen (2008) Estimates of Intergenerational Elasticities based on Lifetime Earnings. (Institute for the Study of Labour (IZA), Bonn). (Discussion Paper No. 3709).

Nunez, Javier I. and Leslie Miranda (2010) Intergenerational Income Mobility in a Less-Developed, High-Inequality Context: The Case of Chile. *The B.E. Journal of Economic Analysis and Policy* 10:1 (Contributions), Art. 33.

Österbacka, Eva (2001) Family Background and Economic Status in Finland. *Scandinavian Journal of Economics* 103, 467–484.

Pakistan Demographic and Health Survey 2006-07 is available at http://www.measuredhs.com/pubs/pdf/FR200/FR200.pdf

Pekkarinen, Tuomas, Roope Uusitalo and Sari Kerr (2009) School Tracking and Intergenerational Income Mobility: Evidence from the Finnish Comprehensive School Reform. *Journal of Public Economics* 93, 965–973.

Piraino, Patrizio (2007) Comparable Estimates of Intergenerational Income Mobility in Italy. *The B.E. Journal of Economic Analysis and Policy* 7, Article 1.

Sewell, W. H. and R. M. Hauser (1975) *Education, Occupation and Earnings:Achievements in the Early Career.* New York: Academic Press.

Shehzadi, Nelum, Sair-ur-Rehman, Razia Sultana, and Zaib-un-Nisa (2006) Intergenerational Mobility and Its Impact on Child Development—A Case Study of Faisalabad (Pakistan). *Journal of Agriculture and Social Sciences* 1813–2235/2006/02–2–72–74 9. [http://www.fspublishers.org].

Solon, Gary (1992) Intergenerational Income Mobility in the United States. *American Economic Review* 82, 393–408.

Solon, Gary (2002) Cross-country Differences in Intergenerational Earnings Mobility. *Journal of Economic Perspectives* 16, 59–66.

Solon, Gary (2004) A Model of Intergenerational Mobility Variation Over Time and Place. In Miles Corak (ed.) *Generational Income Mobility in North America and Europe.* Cambridge: Cambridge University Press

Vogel, Thorsten (2008) Reassessing Intergenerational Mobility in Germany and the United States: The Impact of Differences in Lifecycle Earnings Patterns. (Sonderforschungsbereich 649, Berlin). (Discussion Paper No. SFB649DP2006-055).

Zimmerman, David J. (1992) Regression Toward Mediocrity in Economic Stature. *American Economic Review* 82, 409–429.