FWU Journal of Social Sciences, Vol.18, No.3, Fall 2024, 87-98
DOI: http://doi.org/10.51709/19951272/Fall2024/8

From Earnings to Occupations: Understanding Intergenerational Mobility in Turkey

Sundas Iftikhar and Hasan Vergil
Ibn Haldun University, Turkey

The studies analyzing intergenerational economic mobility have been rather scarce for developing countries due to unavailability of longitudinal datasets. This study uses data from Survey of Income and Living Condition (SILC) from 2006-2021, obtained from Turkish Statistical Institute to analyze the intergenerational income and occupational mobility in Turkey. Besides measuring the dynamics of income and occupational mobility across generations, we also analyze how does the association of children socioeconomic outcome with their family background vary at different career levels of children. Our findings reveal that the association with parents income is much higher for daughters as compared to sons suggesting daughters outcomes are more explained by their family socioeconomic status. Regarding the association of children' outcome with family status at different career stage, the relationship is stronger when children are at the mid-career level. The Bayesian methodology and Pseudo-panel fixed effect model has been employed to estimate intergenerational income elasticity and for the rest of the analysis, Bayesian methodology has been utilized. Our finding also reveals higher intergenerational occupational persistence among children in higher income families while children from disadvantaged families have higher probability of switching career upon receiving good education and income perspective.

***Keywords*:** intergenerational income/occupation mobility, inequalities, household income, Bayesian modeling
JEL Classification : J62, D1, D3, C11

For the fair earning distribution, one's wage should not be determined based on family background. The studies analyzing transfers of economic outcomes across generations focuses on why inequalities exist and the extent of it. Intergenerational economic mobility is a crucial element in the fair distribution of opportunities. Many studies are available focused on intergenerational economic mobility and its various aspects for many countries mostly, developed economies. However, Turkey still lacks such studies to understand the share of inequalities caused due to the transfers of economic/social outcomes across generations.

The research targeted on the transfer of socioeconomic status across generations are to understand the dynamics and factors affecting economic mobilities, to eradicate economic inequalities, and to promote welfare and equality. Higher intergenerational immobility shows persistence of socio-economic status across generations which is caused due to unequal opportunities and disproportion family resources instead of differences in individuals' effort and diligence: higher intergenerational economic persistence could indicate poor allocation of human capital resources. The children coming from disadvantaged family backgrounds might perceive the odds of being successful/ jumping up on the ladder of socio-economic class are caused against them and that could result in the less cooperation in the society (Mogstad & Torsvik, 2023).

Intergenerational income earning elasticity (IGE) is the most frequently metric used to assess the association between children' and fathers' income and other economic opportunities. However, the studies using IGE for the analysis of IGM has mostly been done for developed countries (Solon, 2002), (Chetty, Hendren, Kline, Saez, 2014a), (Chetty, Hendren, Kline, & Saez, 2014), (Cervini-Plá, 2015), (Corak et al., 2014)). Most of this literature targeted the developed economies; developing economies have been ignored so far mainly because of the unavailability of the data required to examine intergenerational economic mobility and its dynamics.

Correspondence concerning this article should be addressed to Sundas Iftikhar ,PhD Scholar, Economics Department, Ibn Haldun University, Turkey, Email: sundas.iftikhar@stu.ihu.edu.tr

The literature on the transmission of economic/social outcomes to the next generation that exists in Turkey, is focused on intergenerational education mobility because of the unavailability of long panel data on households' income. Consequently, Turkey lacks comprehensive studies on intergenerational mobility. The studies conducted on intergenerational mobility include Mercan (2012), Mercan and Barlin (2016) and Duman (2021) which have biased results due to either use of household budget survey or insufficient data used for the analysis. However, a recent study by Demirtaş and Torul (2023) analyzes the intergenerational income mobility in Turkey using Survey of Income and Living Condition Survey (SILC) and TS2SLS methodology- the intergenerational earning elasticity is 0.51 among fathers-sons and 1 among fathers-daughters' pair according to their study which is same as like our study. The elasticity is similar to many other developing countries: between 0.44 & 0.5 in Indonesia (Adli & Sahadewo, 2023), 0.63 in China (Gong, Leigh, & Meng 2012), 0.57 in Soth Africa (Piraino, 2015).

Our paper aims to study this strand of the literature by analyzing intergenerational income and occupational mobility in Turkey, analyzing how these elasticities varies at different career levels of the children. To achieve our objectives and make the best use of the rotational panel data available for Turkey, we would use pseudo panel data (fixed effect) and Bayesian methodology to estimate intergenerational mobility. We use microdata Survey of Income and Living Conditions from the Turkish Statistical Institute (TUIK). The data is cross-sectional data covering the period of 2006-2021, consisting of four survey waves: 2006-2009, 2010-2013, 2014-2016, and 2017-2021. Intergenerational mobility studies require long panel datasets, which helps developing countries to have a comprehensive analysis of intergenerational mobility studies. We will use cross-sectional data and make a pseudo panel to estimate IGE, and make cohorts in pseudo panel settings without taking averages for Bayesian analysis. We switched to Bayesian for the analysis because averages from the pseudo panel do not represent the population well. This research is the initial attempt to analyze intergenerational earning and occupational mobility using Bayesian methodology in Turkey as per our knowledge.

Our study focuses on the following questions:

- How does the association among parental and children income vary across different income groups? Is this association stronger when a father is on the higher wage distribution?
- Does educational attainment mediate the relationship between parental economic outputs and offspring's economic outputs?
- What's the trend of Occupational Persistence in Turkey among different economic groups? Is occupational persistence higher for the children whose fathers are on the higher wage distribution?

By answering these questions, we shed light on the impact education, gender and marital status has on children's earnings in Turkey, also we look at the dynamics of intergenerational income/occupational mobility.

Next section presents a literature review, followed by section 3 which outlines the data and methodology, while section 4 offers a discussion of the findings, section 5 is cohort analysis for robustness check and section 6 concludes the paper.

Literature Review

Recently, there has been a significant rise in the research on the empirics of intergenerational economic mobility. Solon (1992) addresses the biases and measurement errors present in early empirical studies in his seminal paper, proposing a standard methodology for accurately estimating intergenerational income persistence which led to methodological advances and improved data availability, comparable estimates have recently become available for several developing countries (Narayan et al., 2018). Our study is motivated by the lack of such estimates for Turkey.

Turkey lacks research on income intergenerational mobility studies and has mostly focused on education mobility rather than income due to the lack of suitable longitudinal datasets on sons & parents' income. On the literature of intergenerational education mobility, Tansel (2015) utilized TurkStat's Adult Education Survey (AES) and demonstrated that the educational background of mothers plays a more significant role compared to that of fathers, and the association between children and parent's education attainment is pronounced when parents' educational qualification is below primary level. The study by Öztunalı and Torul (2022) investigated both ordinal and cardinal metrics of intergenerational educational mobility using the Intergenerational Transmission of Disadvantages Module of SILC in 2010. Their findings show that educational mobility observed in Turkey lower than that of the developed countries. Aydemir and Yazıcı (2019) explored the difference in intergenerational educational mobility across various regions in Turkey, revealing a positive association among educational mobility and regional development.

The literature on the intergenerational income mobility for Turkey is limited. Mercan (2012) estimated intergenerational income mobility and reported the mobility elasticity in Turkey to be 0.1 which is very low as compared to other developed countries, concluding Turkey to be a very mobile country. Still this study didn't use longitudinal data thus the results could be biased. Mercan and Barlin (2016) estimated intergenerational income elasticity using the Survey of Income and Living Condition (SILC) data set and employed OLS and IV estimation techniques and found intergenerational income elasticity to be between 0.3 and 0.6, which is much higher than the previous study done for Turkey. Another study for Turkey was done by Duman (2021), using Household Budget Survey data for the period between 2003 and 2011, and found a mobility correlation in the range of (0.10, 0.51) for sons and (0.17, 1.00) for daughters. The most recent study which is done by Demirtaş and Torul (2023) for the period of 2005-2017 using TS2SLS for SILC data, found the intergenerational earning elasticity to be 0.51 among fathers-sons and 1 among fathers-daughters' pair. Our paper provides the first insights into the empirical transmission of income between generations using Bayesian approach utilizing the most recent data available, contributing to a better understanding of Turkey's intergenerational mobility. This study complements previous research on the topic.

Our finding suggest that Turkey intergenerational income mobility dynamics are similar to the ones in other developing countries. Adli & Sahadewo, (2023) analyzes intergenerational income mobility for Indonesia using Indonesian Family Survey and found the intergenerational income mobility to be between 0.44 & 0.50. The coefficient around 0.5 shows that there are barriers exist in the economy affecting children mobility, where children' outcome is dependent on their family economic background.

A key aspect of social mobility- which is required because of the innovation brought about by industrialization—is occupational mobility. New income and occupation opportunities are being created due to recent developments in education, communication, technology, and urbanization (Treiman, 1970). However, structural change can often be slow because younger generations may need to change careers (generational occupations) to find work, and their parents may not be able to provide adequate guidance due to their experience in a different working environment.

Economists and sociologists, both, have been investigating the dynamics of occupation mobility as a form of social mobility followed by the seminal contribution of Blau and Duncan (1967) and (Erikson & Goldthorpe, 1992). Andrade et al., (2003) found that borrowing constraints significantly impact intergenerational transfers. If parents are unable to access loans, their ability to invest in their children's human capital is limited, which in turn reduces intergenerational skill transfers. Removing parents' borrowing constraints leads to an increase in investment in their children's human capital, resulting in higher educational levels and abilities. According to Tyree et al., (1979), children often aspire to careers in the same occupational group as their parents and mostly end up working at the same workplace as of their parents in the start of their career.

The literature has examined various factors affecting occupational mobility. Ermisch and Francesconi (2002) investigated the impact of the social status of the parents of married couples on their socioeconomic mobility for the British Household Survey. Their findings suggest that men were influenced by their own parents with a correlation of 0.2, and by their spouses' families with a correlation ranging from 0.17 to 0.25. Women, on the other hand, were influenced by their parents with a correlation ranging from 0.17 to 0.23, and by their spouses' parents with a correlation ranging from 0.16 to 0.18. Bean and Swicegood (1979) stated that ineffective family planning leads to lower social mobility, this conclusion is supported by Corak and Piraino (2010). Hellerstein and Morrill (2011) reported that a girl's career choice is more influenced by her father's occupation than her father-in-law occupation which leads to the conclusion that there is an increase in the transmission of intergenerational occupation-specific human capital.

Carmichael's (2000) study on intergenerational mobility in the UK demonstrates that the success of a generation is dependent on the success of the previous generation. Farid & Abbasi (2020) study's finding for Pakistan suggest that persistence of economic class across generations is more common in children coming from high-income family because they have the resources to have more or maintain the opportunities. Motiram and Sing (2012) found a significant lack of occupational mobility in India, particularly among those in low-skilled and low-paid jobs.

Children's occupational choices and thus mobility can be explained by parents' socio-economic status, e.g., 40.5% children of university graduate parents are high skilled while only 11% of children, whose fathers

completed high school, worked in jobs that required high skills. Generally, the longer children and parents spend in school, the higher the probability of entering occupations with a higher social status (Andrade et al., 2003). Hellerstein and Morrill (2011) found that 30% of men and 20% of women followed their fathers. These findings were supported by Ermish and Francesconi (2002), Di Pietro and Urwin (2003), and Ferrie (2005). Our study also focuses on the occupational mobility, besides investigating the dynamics of income mobility for Turkey.

Method

We use survey of income and living conditions (SILC) data from 2006-2021, it is a rotational panel data which tracks individuals for maximum of four years. We use cohorts for analysis based on career level to better understand the impact of family income at different career stages of children. The cohorts are made by grouping children based on age: the 26-35 age group is considered to be at the beginning of their career level, the 36-45 age group is considered to be at the mid-career level, and the 46-55 age group is considered to be at the peak of their career level. Before the analysis, it's better to look at the descriptive statistics of the data. Table 1 shows descriptive statistics of the data. Descriptive statistics have been given for whole sample and also for children being at different career stages. The descriptive statistics has been reported for children who have non-zero wage and between the age 26-55. Fathers earning represent the household earnings, and it could represent mothers earning as well if the household is a mother.

Table 1

Descriptive Statistics

Variables	Full Sample		Beg. of Career		Mid-career-level		At peak-career level	
	Mean	Std.	Mean	Std.	Mean	Std.	Mean	Std.
Children Earnings	9.266	1.052	9.375	1.024	9.167	1.059	9.042	1.142
Father Earnings	9.915	0.887	10.022	0.868	9.717	0.892	9.642	0.897
Education	3.702	1.521	3.809	1.522	3.630	1.548	3.413	1.566
Marital Status (1=single, 0=otherwise)	0.613	0.486	0.691	0.461	0.465	0.498	0.406	0.491
Gender (1=male, 0=otherwise)	0.680	0.466	0.688	0.463	0.676	0.467	0.626	0.4838
No. of obs	11651	11651	6709	6709	3993	3993	949	949

Notes: the data has been taken from SILC.

Pseudo Panel Data

Panel data, which entails both time series and cross-section dimensions, are widely recognized to be advantageous when used for empirical research. However, due to the cost it takes to follow the same individual over time, panel data might not be available in many settings, unlike the cross-sectional data which is more commonly available where each wave observes a different set of individuals. Those individuals could be grouped in cohorts based on some common characteristics that don't change over time, such as birth year, gender, etc. Then, the mean of these cohorts is treated as if they are observations of an actual panel. Pseudo-panel has various benefits over panel data set with a smaller sample set, at the same time cross-sectional datasets are the better representative of the population e.g., household surveys, health and demographic surveys. The averaging process involved in creating pseudo-panels diminishes measurement error at an individual level, which is very common in survey data.

Many developing countries lack panel data to study intergenerational mobility where specific households are followed over time. This study uses rotational panel surveys to analyze intergenerational dynamics in Turkey using data from **TUIK,** the survey has four waves 2006-2009, 2010-2013, 2014, 2017, and 2018-2021. To find intergenerational earning elasticity, panel data is required- so we will use the available cross-sectional data under some assumptions to treat it as panel data. In a pseudo-panel setting, we will follow cohorts instead of following households. From each cohort, successive random samples will be produced via the surveys. A time series gets generated from these random samples' summary statistics which can be used to predict behavioral relationships for the cohorts, just as if the panel data was available. In the following paragraph, the construction of such a cohort and its use for the estimation of intergenerational earning elasticity has been discussed in detail.

Our primary concern about using a pseudo panel is that the sample means of each cohort might not be the actual representation of the whole cohort population means. Usually, a cell size (the number of individuals in a

cohort) of 100 might be sufficient to reduce sampling error (Verbeek & Nijman, 1992). This leads to our following methodology, which we will be using for our analysis.

Bayesian Estimation:

The Bayesian approach has the following form for the general panel data model, which has been used by Carrington and Zaman (1994).

$$Y_{it} = X_{it}\beta_{it} + \varepsilon_{it} \tag{1}$$

Where Y is dependent variable representing children of different age groups 26-35 shows children at being the early career level, 36-45 shows children being at the mid-career level and 46-55 is for the children being at the peak of their career level. In our study X is independent variable, t number of time period and t=1, 2, ----, T, i is the number of age groups i.e. i=1, 2 and 3 in our study: 26-35, 36-45 and 46-55. β is the coefficient of each age group. Equation (1) can be explained as

$$Y_i = \begin{bmatrix} y_{i1} \\ y_{i2} \\ . \\ . \\ . \\ y_{it} \end{bmatrix}_{t\times 1}, \; X_{it} = \begin{bmatrix} x_{i1} \\ x_{i2} \\ . \\ . \\ . \\ x_{it} \end{bmatrix}_{t\times k}, \; \varepsilon_{it} = \begin{bmatrix} \varepsilon_{i1} \\ \varepsilon_{i2} \\ . \\ . \\ . \\ \varepsilon_{it} \end{bmatrix}_{t\times 1} \text{ and where } X_{it} = \begin{bmatrix} X_{it}^1 & X_{it}^2 & ..... & X_{it}^k \end{bmatrix}_{k-Regressors}$$

$\varepsilon_{it} \sim N(0, \delta_i^2)$

δ_i^2 is the variance of error term of each age group.

The data density is ${}^{\beta^\wedge}/_{\beta} \sim N(\beta, \Omega_i)$ (2)

and the prior density is $\beta \sim N(\mu, \Lambda)$ (3)

so, then posterior density will become as ${}^{\beta}/_{\beta^\wedge_i} \sim N(m_i, \mathrm{V}_i)$ (4)

Where the values of Equation (4) are as

$$m_i = V_i\left(\Omega_i^{-1}\hat{\beta}_i + \Lambda^{-1}\mu\right) \; and \; V_i = \left(\Omega_i^{-1} + \Lambda^{-1}\right)^{-1} \tag{5}$$

{The details of the Analytical solutions of posterior density can be found in (Zaman, 1996)}. As the Classical Bayes estimator is the mean of posterior. So

$$\hat{\beta}_{i(CB)} = V_i\left(\Omega_i^{-1}\hat{\beta}_i + \Lambda^{-1}\mu\right) \text{ and its variance-covariance matrix is } V_i = \left(\Omega_i^{-1} + \Lambda^{-1}\right)^{-1} \tag{6}$$

The two hyper parameters, μ and Λ are unknown. If these two are estimated from the data, then $\hat{\beta}_{i(CB)}$ will be termed as Empirical Bayes estimator and equation (6) becomes as

$$\hat{\beta}_{i(EB)} = \hat{V}_i\left(\hat{\Omega}_i^{-1}\hat{\beta}_i + \hat{\Lambda}^{-1}\hat{\mu}\right) \tag{7}$$

Where the values of equation (7) are as

$$\hat{\Lambda} = \left(\sum_{i=1}^{n}\Omega_i^{-1}\right)^{-1} \text{ and } \hat{\mu} = \hat{\Lambda}\left(\sum_{i=1}^{n}\hat{\Omega}_i^{-1}\hat{\beta}_i\right)$$

The advantage of Empirical Bayes technique is that it considers heterogeneity with great care and Empirical Bayes has much lesser standard errors as compared to other techniques in the literature (Zaman, 1996). Moreover, in our case as it is pooled panel, therefore the heterogeneity matters a lot and the simple estimators like OLS with robust standard errors or GLS do not perform well {(Zaman, 1996) and Carrington and Zaman (1994)}.

The Empirical Bayes Estimator is the precision weighted average of the first level estimates of each cohort. Intuitively, it makes sense as it takes the first regressions from each cohort and all the issues relating to

regression models (heteroskedasticity, autocorrelation and endogeneity) are addresses at first level regressions. The other advantage is that it takes the variation of each cohort into account at the second level of estimation (prior estimation). After that when it goes back to each cohort estimation, it considers two types of variation (first level and second level(prior)). The empirical Bayes Estimator is more efficient than GMM and traditional estimators (OLS, 2SLS, GLS etc.), therefore it may be preferred. On the intuitive side, Empirical Bayes is better than rest of all above as it takes into account two types of variations {(Zaman, 1996) and Carrington and Zaman (1994)}. For detailed discussion on Empirical Bayes and other estimators, see (Zaman, 1996).

This paper applies two methodologies namely fixed effect on pseudo panel data and Empirical Bayesian modelling in pseudo panel data setting.

The Measurement of Intergenerational Earning Mobility

We are starting this section by estimating intergenerational elasticity using individuals' earning data taken from SILC surveys from 2006-2021. We have converted nominal earnings into real earnings using the consumer price index. Following Becker & Tomes (1986), we will estimate IGE to estimate the relationship between children's and fathers' income using the following equation:

$$y_i^c = \alpha + \beta y_i^f + \varepsilon_i^c \quad (8)$$

Where y_i^c is children income, β is the slope coefficient which measures the impact of the family's income status on the children income, ε_i^c is a white noise error term. The value of β $closer$ to 1 shows immobility, while estimates of β closer to zero show rapid regression to the mean, indicating higher mobility. The coefficient of β would further be decomposed into its causal components to take into account the other factors such as genetic and cultural endowments that transmit from parents to children: education of children, gender of children, and marital status of children.

$$y_i^c = \alpha + \beta_1 \text{Income}^f + \beta_2 \text{Education}^c + \beta_3 \text{Gender}^c + \beta_4 \text{marital status}^c + \varepsilon_i^c \quad (9)$$

The second goal of the paper is to estimate the occupational mobility dynamics in Turkey. As the dependent variable is a dichotomous variable, where 1 is assigned when parents & children are in the same occupation and the value of 0 is assigned otherwise. The logit model has been regressed to estimate the trend of Occupational Persistence in Turkey among different economic groups; we will estimate the following model:

$$\text{Occupation}^c = \alpha + \beta_1 \text{Income}^c + \beta_2 \text{Education}^c + \beta_3 \text{Gender}^c + \beta_4 \text{marital status}^c + \varepsilon_i^c \quad (10)$$

Where β_1 accounts for the impact of children income on the decision of whether to follow the father's occupation or not, β_2 is the coefficient on the impact of children education which has on the income, the slope coefficient β_3 estimates the role of gender on children's earnings and the coefficient β_4 measures the impact of marital status on the dynamics of children following their fathers' occupation.

Results

Table ***2*** presents estimates of intergenerational elasticity between children and fathers, first row results have been estimated using Bayesian methodology while second-row results have been calculated using the pseudo panel fixed effect model.

Table 2

Intergenerational Earning Elasticity (IGE)

	IGE-Male	IGE-Female	IGE-Full Sample
Bayesian	0.523	0.528	0.526
	(0.008)	(0.007)	(0.010)
Pseudo Panel	-	-	0.948
			(0.085)
No. of obs	7916	3735	11651

Author's own calculation. The data has been taken from SILC.

The first and second column report results of male and female separately to see how the elasticity differs for both genders, and the last column report results for the whole sample. The association between fathers' and daughters' earnings is slightly higher than the association between sons' and fathers' income. This shows that mobility is lower for daughters in Turkey, and this could be due to cultural and institutional factors such as sons can find a job more easily and daughters' education and economic outcomes are more dependent on their family income The IGE coefficient is 0.526 for the overall sample which is close to the recent study done by Demirtaş & Torul (2023) for Turkey.

Table 3
IGE at Different Career-Level

	Child Income	Child Income	Child Income
VARIABLES	**26-35**	**36-45**	**46-55**
Father Income	0.505*	0.543*	0.480*
	(0.011)	(0.015)	(0.035)
Constant	4.370*	3.981*	4.519*
	(0.112)	(0.147)	(0.342)
Observations	6709	3993	949
R-squared	0.188	0.210	0.137

Notes: Standard errors in parentheses: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***3*** shows the result of the IGE coefficient for the three cohorts which have been made based on individuals age. The first columns report the result of IGE between fathers' income and children' income when children are between the ages of 26 and 35, the second columns report the IGE between fathers and children' income when children are between the age of 36 and 45, and the last columns represents the association between fathers' income and children' income when children are between the age of 46-55. These three age groups have been formed to represent the different career levels of children: 26-35 age shows when children are at the beginning of their career level, 36-45 when they are in the middle of their career journey, and 46-55 age groups represents children being at the peak-age of their career. All the coefficients are positive and highly significant; however, the IGE coefficient is highest when children are between the age of 36-45, representing children' income is highly explained by their father's income when they are at the mid of their career level.

Table 4
IGE for Different Quantiles

	1st quantile	2nd quantile	3rd quantile	4th quantile
VARIABLES				
Father Income	0.483*	0.525*	0.516*	0.521*
	(0.008)	(0.008)	(0.009)	(0.008)
Constant	4.474*	4.041*	4.127*	4.111*
	(0.081)	(0.088)	(0.094)	(0.083)
No. of obs	1150	2486	3040	4975

The table presents results of IGE estimates for children whose fathers belong to different economic backgrounds. 25% (1st quantile) represents the IGE estimate when children come from the lowest-income family background and 100% (4th quantile) represents the richest economic family status.

Table 4 shows the result of the association between fathers' and children' income when fathers are divided into different income quantiles. The first column shows the result of the IGE coefficient for children when their fathers are in the first quantile, which shows the poor class of the sample, similarly 2nd, 3rd and 4th quantiles are representing middle, upper middle class and rich fathers in the sample- all the IGE coefficients are significant at 1% level, the coefficient of association among fathers' income and children' income is the highest when fathers are in 2nd quantile and 4th quantile. The results from the table 4 shows that the association between fathers' income and sons' income in the low-income families. On the other hand, sons' income dependence on fathers' income gets stronger for high-income families, the association is strongest for the middle income followed by families on the fourth quantile (richest income group).

Table 5
Determinants of Sons' Income

	Child Income	Child Income	Child Income
VARIABLES	Beginning of Career	Mid-Career	At Peak of Career
Father Income	0.513*	0.512*	0.510*
	(0.007)	(0.008)	(0.009)
Education	0.020*	0.019*	0.020*
	(0.004)	(0.004)	(0.005)

Gender	0.068* (0.014)	0.077* (0.016)	0.075* (0.018)
Marital Status	0.154* (0.014)	0.171* (0.015)	0.161* (0.017)
Constant	3.987* (0.078)	3.987* (0.084)	4.001* (0.084)
No of obs	6709	3993	949

Notes: Standard errors in parentheses: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***5*** has results from Bayesian regression when fathers' income, education, marital status, and gender of children on different career levels are regressed on children's income. The first column entails results of the initial career stage regression, the second column is for when children are at mid-career level and the third column is for when children are at the peak of their career level: children income is explained 51.3% by the father income when he is at the initial and 51.2% when he is at the mid-stage of his career and 51% when he is at the peak of his career level representing children' income is less affected by the fathers' income when children are at the peak of their career level as compared to when they are at the beginning or mid-career level. Income is affected by the education level at all career levels, it's the highest for children at their peak career level, which is 2.09% followed by the children at their initial career level, 2.04%. Gender is a dummy variable, 1 for male and 0 for female; all the coefficients for gender are significant and positive, showing being male has a positive effect on personal income- the highest coefficient is for sons at the of their career level, followed by sons at the peak of their career level. Marital status is also a dichotomous variable, 1 show being single and 0 is otherwise. Being single has the highest positive impact when you are at the middle of your career level, followed by when you are at the peak of your career level.

Table 6

Occupational Mobility

	1st and 2nd quantile	3rd and 4th quantile
VARIABLES	**Poor-Lower Middle**	**Upper Middle-Rich**
Income	-.221*	-.052*
	(.033)	(.064)
Education	-.064*	-.035*
	(.016)	(.020)
Gender	.039*	.207*
	(.054)	(.068)
Marriage	-.015*	.002*
	(.039)	(.044)
Constant	1.131*	.676*
	(.3105)	(.65554)
No. of obs	3636	8016

Notes: Standard errors in parentheses: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***6*** shows the results for occupational mobility trends in Turkey. The dependent variable, occupational persistence, which is a binary variable, 1 when sons are in same occupation as of their fathers and 0 when otherwise. Income is the most crucial factor affecting the occupational mobility of the children: higher income is negatively related to occupational persistence- meaning that with increase in income, the probability of occupational persistence decreases which leads to an increase in probability of occupational mobility. This relationship is higher for children whose fathers have low-income, showing given the higher income, the tendency to follow a different occupation than of their father is more elevated in low-income families as compared to wealthy families- which confirms our hypothesis that occupational mobility is lower in rich families. Being highly educated is negatively related to occupational persistence as well, however, this relationship just like income, is stronger for children belonging to low-income families: being highly educated would reduce the likelihood of sons following their fathers' occupation. This suggest that educational institution play a significant role in individuals career's trajectories (Khan et al.,2020). The gender coefficient shows the impact of being male on occupational mobility: being male in rich families has a higher probability of following the father's occupation than being female, and the relationship is more robust in rich families. The coefficient of marriage shows the impact of being single on the probability of child following their father's occupation- being single reduces the likelihood of

children following their father's occupation in low-income families, at the same time this relationship is positive for rich families. Being single in rich families would have a chance of children following their father's occupation.

Cohort Analysis for Robustness Check:

To test the robustness of our model, by utilizing one wave of our rotational panel data of survey income of living condition from 2014-2017 we have used empirical Bayesian methodology along with the methodology which is usually used in intergenerational mobility studies when panel data is available, OLS. The analysis has only been done on the 1,251 individuals whose data was available for at least consecutive 3 years-for SILC data, the maximum data available for an individual is 4 years. The results from Bayesian methodology and OLS both have the same signs on the coefficients, and most of the coefficients are very close to each other. For instance, the coefficients for father's income are closely aligned in both methodologies, indicating that the relationship between father and son incomes remains consistent regardless of the estimation method used. Bayesian and OLS coefficients are of almost similar magnitude across different age groups, quantiles, and career stages confirming the effectiveness of methodology used to capture the core dynamics of IGM.

Table 7

IGE at Different Career-Level

	26-35		36-45		46-55	
	OLS	**Bayesian**	**OLS**	**Bayesian**	**OLS**	**Bayesian**
Father Income	0.331***	0.345***	0.321***	0.347***	0.557***	0.363***
Constant	6.20***	6.094***	6.496***	6.125***	4.032**	5.934***
N	710		389		89	

Note: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table 7 provides result of intergenerational mobility of sons divided in 3 age groups, from OLS estimation and Bayesian methodology. The direction of the association between sons' income and fathers income from both methodologies is same. The estimates shows that fathers' income have significant and positive impact on sons' income. If the coefficient is close to 1, it shows immobility, coefficients closer to 0 represent mobility.

Table 8

IGE for Different Quantiles

	1st quantile		2nd quantile		3rd quantile		4th quantile	
	OLS	**Bayesian**	**OLS**	**Bayesian**	**OLS**	**Bayesian**	**OLS**	**Bayesian**
Father Income	0.0369***	0.235***	0.940***	0.284***	0.370	0.283***	0.485***	0.336***
Constant	8.918***	7.152***	0.194***	6.665***	5.834	6.693***	4.644**	6.183***
N	273		402		337		238	

Note: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***8*** reports the result of OLS and Bayesian regression estimates of IGM based on fathers' income, e.g., fathers are being divided based on their income. So, 1st quantile father's income group refers to children belong to low-income group and 4th quantile is the richest-income group. Fathers' income has positive impact on sons' income irrespective of the family status.

Table 9

Determinants of Sons' Income

Variables	**Child Income Beginning of Career**		**Child Income Mid-Career**		**Child Income At Peak of Career**	
	OLS	Bayesian	OLS	Bayesian	OLS	Bayesian
Father Income	0.254***	0.230***	0.125*	0.194***	0.182	0.211***
Education	0.160***	0.175***	0.191***	0.187***	0.248***	0.190***
Gender	-0.181**	-0.182***	-0.0805	-0.167***	-0.372	-0.195***
Marital Status	0.118*	0.118***	-0.0253	0.080***	0.211	0.136***
Constant	6.408***	6.617***	7.832***	7.010***	7.135***	6.766***

N	710	389	89

Note: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***9*** reports results of OLS regression and Bayesian on the impact of various variables on sons' income at different career level. Fathers' income has significant positive impact on sons' income at all career stages. Besides fathers' income, education and being single has positive impact on sons at all career stages. The gender (1=male) coefficient is negative representing being male is negatively related to income, the sign of the gender coefficient is same for both methodologies for all career level.

Table 10

Occupational Mobility

Variables	1st and 2nd Quantile		3rd and 4th Quantile	
	OLS	**Bayesian**	**OLS**	**Bayesian**
Income	0.0878	0.178***	0.397**	0.006***
Education	-0.0282	-0.044***	-0.137	0.001***
Gender	-0.0492	-0.095***	-0.127	0.015***
Marriage	0.292*	0.142***	-0.157	0.007
Constant	-2.369	-2.806***	-3.900**	0.557***
N	675		575	

Note: *** p<0.1, ** p<0.05, * p<0.01. The data has been taken from SILC.

Table ***10*** shows the result of occupational mobility regression using OLS and Bayesian, both yielding coefficients with same sign for 1st and 2nd quantile income-group.

Conclusion

Intergenerational mobility leads to a rise in individuals' well-being and higher economic equality. This paper sheds light on intergenerational income and occupational mobility in Turkey using microdata from Turkstat on the Survey of Income and Living Conditions (SILC) from 2006-2021, using pseudo-panel (fixed effect) and Bayesian methodology.

We estimate intergenerational earning elasticities using individuals' earnings for parents-son and parents-daughter pair. Our paper also contributes to the literature by estimating the intergenerational earning elasticity and occupational mobility for children at different career levels, using their age as a proxy variable: 26-35 (beginning career level), 26-45 (mid-career level), and 46-55 (peak of the career level). We have considered the association among education, gender, marital status, and intergenerational mobility throughout our analysis. Our results offer detailed insights that are significant and robust.

The intergeneration earning elasticity for males in Turkey is slightly higher for the parents-son pair than for the parents-daughter pair. The intergenerational elasticity for the whole sample is 0.52, which is very close to the IGE found by Demirtaş and Torul (2023). Our results show intergenerational mobility is lower when parents are in the 2nd and 4th quantile of the income distribution. On estimating the impact of family income on children income at different stages of career levels, we found a higher association of parents' income when children are at the middle of their career level.

Our paper also analyses how the different variables affect the intergenerational occupational mobility dynamics from different socio-economic backgrounds in Turkey. Our findings show that income is the strong incentive for children to break the cycle of intergenerational occupational persistence. This relationship is strong when children are in poor families- the coefficient for children coming from richer families is much smaller, which shows that given the higher income incentive, intergenerational occupational mobility is higher in poor families as compared to the children coming from rich families: intergenerational occupational persistence is higher in wealthier families.

Overall, the finding of our study suggests that high persistence in rich families indicate a barrier to children coming from low-income family background in breaking the cycle of generational poverty. Education is a key factor in breaking this cycle, and policies amid at providing quality education to all children, regardless the social class they belong to, is essential to increase mobility in the country.

Funding: This research was supported by Ibn Haldun University Scientific Research Project (BAP) under grant number 23027902.

References

Adli, M. I., & Sahadewo, G. A. (2023). Estimating Intergenerational Income Mobility in Indonesia: Estimating Intergenerational Income Mobility in Indonesia. *Jurnal Ekonomi dan Pembangunan, 31(1*), 43-58.

Andrade, E. Veloso, F. Madalozzo, R., Ferreira, S.G. 2003. *Do Borrowing Constraints Decrease Intergenerational Mobility in Brazil? A Test Using Quantile Regression*. Insper Working Paper WPE: 045/2003.

Aydemir, A. B., & Yazici, H. (2019). Intergenerational education mobility and the level of development. *European Economic Review, Vol.116,* pp. 160-185.

Bean, F. D., & Swicegood, G. (1979). Intergenerational occupational mobility and fertility: A reassessment. *American Sociological Review, Vol. 44 No*. 4, pp. 608-619.

Becker, G. S., & Tomes, N. (1986). Human Capital and the Rise and Fall of Families. *Journal of Labor Economics, Vol. 4* No. 3, pp. S1–S39.

Blau, P. M., & Duncan, O. D. (1967). The American Occupational Structure. *John Wiley & Sons*, Inc.

Carmichael, F. (2000). Intergenerational mobility and occupational status in Britain. *Applied Economics Letters, Vol. 7* No. 6, pp. 391-396.

Carrington, W. J., & Zaman, A. (1994). Interindustry Variation in the Costs of Job Displacement. *Journal of Labor Economics, Vol. 12* No. 2, pp. 243–275. https://doi.org/10.1086/298357

Cervini-Plá, M. (2015). Intergenerational Earnings and Income Mobility in Spain. *Review of Income and Wealth, Vol. 61* No. 4, pp. 812–828. https://doi.org/10.1111/roiw.12130

Chetty, R., Hendren, N., Kline, P., & Saez, E. (2014a). Where is the land of Opportunity? The Geography of Intergenerational Mobility in the United States *. *The Quarterly Journal of Economics, Vol. 129 No. 4*, pp. 1553–1623. https://doi.org/10.1093/qje/qju022

Chetty, R., Hendren, N., Kline, P., Saez, E., & Turner, N. (2014). Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility. *American Economic Review, Vol. 104 No. 5,* pp. 141–147. https://doi.org/10.1257/aer.104.5.141

Corak, M., Lindquist, M. J., & Mazumder, B. (2014). A comparison of upward and downward intergenerational mobility in Canada, Sweden and the United States. *Labour Economics, Vol. 30*, pp. 185–200. https://doi.org/10.1016/j.labeco.2014.03.013

Corak, M., Piraino, P., 2010. The intergenerational transmission of employers. *J. Labor Econ, Vol, 29 No,* 1, pp. 37–68.

Demirtaş, N. M., & Torul, O. (2023). Intergenerational income mobility in Turkey. *The Journal of Economic Inequality, pp. 1-25*.

Di Pietro, G., & Urwin, P. (2003). Intergenerational mobility and occupational status in Italy. *Applied Economics Letters, Vol. 10 No. 12*, pp. 793-797.

Duman, E. (2021). Intergenerational Income Mobility in Turkey. *Optimum Ekonomi ve Yönetim Bilimleri Dergisi, Vol. 8 No.* 2, pp. 223–238. https://doi.org/10.17541/optimum.836632

Erikson, R., & Goldthorpe, J. H. (1992). Individual or Family? Results from Two Approaches to Class Assignment. *Acta Sociologica, Vol. 35 No. 2*, pp. 95–105.

Ermisch, J., Francesconi, M. 2002. I*ntergenerational Social Mobility and Assortative Mating in Britain.* Institute for Social and Economic Research ISER Working Papers Number 2002–2006.

Farid, S., Abbasi, S. U. R. S., & Akram, M. B. (2020). An Assessment of Class Reproduction Theory in Southern Punjab, Pakistan. *FWU Journal of Social Sciences, 14(1).*

Ferrie, J. P. (2005). History lessons: The end of American exceptionalism? Mobility in the United States since 1850. *Journal of Economic Perspectives, Vol. 19 No. 3,* pp. 199-215.

Gong, H., Leigh, A., & Meng, X. (2012). Intergenerational income mobility in urban China. *Review of Income and Wealth, 58(3*), 481-503.

Hellerstein, J. K., & Morrill, M. S. (2011). Dads and Daughters: The Changing Impact of Fathers on Women's Occupational Choices. *The Journal of Human Resources, Vol. 46 No. 2*, pp. 333–372.

Khan, I. U., Idris, M., & Khan, A. U. (2020). An Investigation of the Factors Affecting Institutional Performance: Evidence from Higher Education Institutions. *FWU Journal of Social Sciences, 14(3).*

Mercan, M. A. (2012). Intergenerational Income Mobility in Turkey. *Iktisat Isletme ve Finans, Vol. 27 No. 318, pp. 83–94.*

Mercan, M. A., & Barlin, H. (2016). Intergenerational Income Elasticity in Turkey: A New Estimate. I*nternational Journal of Research in Business and Social Science (2147-4478*), Vol. 5 No. 3, pp. 30-37.

Mogstad, M., & Torsvik, G. (2023). Family background, neighborhoods, and intergenerational mobility. *Handbook of the Economics of the Family, Vol. 1 No. 1,* pp. 327-387

Motiram, S., & Singh, A. (2012). How close does the apple fall to the tree? Some evidence from India on intergenerational occupational mobility. E*conomic and Political Weekly, pp. 56*-65.

Narayan, A., Van der Weide, R., Cojocaru, A., Lakner, C., Redaelli, S., Mahler, D. G., ... & Thewissen, S. (2018). Fair progress?: *Economic mobility across generations around the world.* World Bank Publications.

Öztunalı, O., & Torul, O. (2022). The evolution of intergenerational educational mobility in turkey. *Emerging Markets Finance and Trade, Vol. 58 No. 14,* pp. 4033-4049.

Piraino, P. (2015). Intergenerational earnings mobility and equality of opportunity in South Africa. *World development, 67,* 396-405.

Solon, G. (1992). Intergenerational income mobility in the United States. The American Economic Review, 393-408.

Solon, G. (2002). Cross-Country Differences in Intergenerational Earnings Mobility. *Journal of Economic Perspectives, Vol. 16 No. 3*, pp. 59–66.

Tansel, A. (2015). Intergenerational educational mobility in Turkey. *IZA Discussion Paper No. 9590*

Treiman, D. J. (1970). Industrialization and social stratification. *Sociological inquiry,*

Tyree, A., Semyonov, M., & Hodge, R. W. (1979). Gaps and glissandos: inequality, economic development, and social mobility in 24 countries. *American Sociological Review, pp. 410-424.*

Verbeek, M., & Nijman, T. (1992). Can cohort data be treated as genuine panel data? pp. 9-23. *Physica-Verlag HD.*

VOL. 40 No. 2, pp. 207-234.

Zaman, A. (1996). S*tatistical foundations for econometric techniques.* Academic Press.