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RESEARCH ARTICLE

INTERGENERATIONAL MOBILITY IN TURKEY BASED ON EDUCATION

Y. Enes AKSU[*]
Feride DOĞANER GÖNEL[**]

Abstract

The concept of intergenerational mobility refers to the association between parents' and their children's socio-economic well-being. As an interest and policy area, understanding the three aspects of intergenerational transmission stands out, i) social welfare ii) equality of opportunity, and iii) economic efficiency. First, it is essential to know how resources are allocated across generations because this allocation process may influence overall social welfare defined over the entire income distribution of different generations. Secondly, intergenerational mobility may be seen as a measure of equality of opportunity. Moreover, it can be one of the ways to reduce socioeconomic inequality by promoting social justice and achieving a more equitable allocation of resources (D'Addio, 2007). Although the studies of intergenerational transmission go back to the mid-19th century (Galton, 1869), it has been started to analyze and interpreted, more recently. From the 1960s, some empirical studies on economic, social and political determinants of mobility mostly in developed countries, such as the UK, USA, Canada and Sweden (Solon, 1999, 2002; Zimmerman, 1992; Black and Devereux, 2010; Björklund and Salvanes, 2011), are published, but for developing countries there are few works mostly due to data constraints and structural problems such as informal and household-based economic activities (Mercan, 2012, 2020; Emran & Shilpi, 2019, Demirtaş and Torul, 2023). In this direction, this study aims to contribute scarce literature on intergenerational mobility in Turkey by using the Adult Education Survey (AES) provided by TURKSTAT. Our results indicate a strong relationship between the socioeconomic status of the family and the socioeconomic status of the child, albeit decreasing over the birth cohorts. In addition to these results, persistence in terms of intergenerational mobility is higher for females with respect to males.

Keywords: Intergenerational Mobility, Education, Human Capital
JEL Classification: J6, I2

1. Introduction

It has long been recognized that high levels of intergenerational mobility in a society have important social and economic consequences. Most importantly, low relative intergenerational mobility is likely to create a sense of fairness arising from the fact that an individual's welfare is

[*] Piri Reis University, Economics and Finance Department, E-mail: yeaksu@pirireis.edu.tr, ORCID: 0000-0001-5114-9620
[**] Yildiz Technical University, Economics Department, E-mail: gonel@yildiz.edu.tr, ORCID: 0000-0001-7946-9298

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almost entirely dependent on birth. Another point is that relatively low intergenerational mobility will hinder potential productivity gains that would exist in the economy and directly affect the welfare of society. When children's skills are neglected due to insufficient resources, society also loses out. Galton issued the first warning in this regard (1869). The relationship we call the regression line was shaped by Galton for the first time in the 19th century, with the idea that parental traits are passed on to their children. He compared children's height to their parents and found that adult children are closer to average height than their parents. We can easily relate the Galtonian approach to the extent to which generations inherit their present status from the past and to what extent they will transfer it to the future. Therefore, the concept of intergenerational mobility refers to the association between parents and their children's socioeconomic well-being. Once we acknowledge the significance of the issue, we also understand that the degree of intergenerational mobility is one of the fundamentals for the understanding of inequality in both economic and social means; in the case of low intergenerational mobility, poverty during childhood will not only undermine the health, nutrition and education prospects of children but will also increase the possibilities that the children of the next generation will grow up in low-income households (D'Addio, 2007).

In this context, understanding the three aspects of intergenerational transmission stands out as an area of interest and policy: i) social welfare ii) equality of opportunity, and iii) economic efficiency. First, it is essential to know how resources are allocated across generations because this allocation process may influence overall social welfare defined over the entire income distribution of different generations. Secondly, intergenerational mobility may be seen as a measure of equality of opportunity. Moreover, as mentioned above, it can be one of the ways to reduce socioeconomic inequality by promoting social justice and achieving a more equitable allocation of resources. For example, the likelihood of achieving social cohesion can be higher in a society where people believe that they can move up the social ladder thanks to their abilities, talents, and efforts rather than opportunities linked to their socio-economic background. Third, intergenerational mobility may also be an instrument for achieving greater economic efficiency because high mobility may imply talents of some individuals placed at the bottom of the income distribution are not wasted (D'Addio, 2007).

The literature on intergenerational mobility and its measurement is based on three "factors," namely income, occupation, and education, and addresses different aspects of social class structure with respect to the social status of the individual. As an interdisciplinary area, a large number of studies can be found in sociology literature, which tries to capture the intergenerational transmission of occupations (Erikson, Goldthorpe, & Portocarero, 1979; Torche, 2005; Goldthorpe, 2014). In addition, the sociological literature also distinguishes between absolute and relative mobility. Absolute mobility focuses on the number of individuals moving from one social class to another (D'Addio, 2007). On the other hand, relative social mobility, also known as social fluidity, is concerned with the probability of individuals from different backgrounds moving into a particular social class. It includes the proportion of individuals from two different categories who go through a given mobility transition. On the other hand, the literature on economics focuses

on the intergenerational transmission of earnings (or income) (Solon, 1992; Zimmerman, 1992; Black & Devereux, 2010). However, a growing body of research in both economics and sociology also concentrates on education due to its mediating role in an individual's prospects by using human capital theory. Vast empirical literature points out that the education level of an individual is strongly connected with his/her future earnings (Becker, 1975; Mincer, 1974; Card, 1999, 2012). Therefore, access to education and educational inequality in a country play an important role in the eventual social class structure and future income inequality. This relationship between economic inequalities and education inequalities represents a societal failure.

In this framework, this study aims to contribute scarce literature on intergenerational mobility in Turkey by using the Adult Education Survey (AES) provided by TURKSTAT. The rest of the paper is organized as follows. After this introduction section, section 2 explains intergenerational mobility and provides a literature review from the perspective of economics and sociology disciplines. Section 3 describes the data and discusses the methodology. Section 4 presents the estimation results of intergenerational mobility in Turkey. Section 5 offers conclusions and discusses our results by using the previous studies on intergenerational mobility in Turkey.

2. Overview of Literature on Intergenerational Mobility

The connection between education and social background in the literature of intergenerational mobility research is highly robust. While educational attainment plays a significant role in determining socioeconomic success, parental education also exerts a primary influence on a person's educational outcomes. Educational outcomes are more easily measured than other socioeconomic outcomes and closely related to the mechanisms underlying the intergenerational transmission of socioeconomic status. In particular, educational outcomes are considered to be important mediators for income and occupational success.

The mediating role of education in intergenerational mobility role has been formalized by Solon (2004). According to Solon, in generation *t*, labor market earnings *W* are a function of human capital *H*,

$$W_t = \gamma_1 H_1 + v_t \quad (1)$$

where u_t stands for a random error term and γ_1 represent returns to the human capital investment of an individual in generation *t*. If a descendant's human capital accumulation process is related to the earnings of parents. Then the human capital level of the descendant can be written as,

$$H_t = \delta_1 W_{t-1} + \epsilon_t \quad (2)$$

where ϵ_t is a random error term and δ_1 shows the sensitivity of the descendant's human capital level to parental earnings. Thus, combining equation (1) with (2) yields an intergenerational mobility function which is,

$$W_t = \gamma_1 \delta_1 W_{t-1} + u_t \tag{3}$$

where $u_t = \gamma_1 \epsilon_t + v_t$. Thus, intergenerational mobility will be higher where the returns of human capital γ_1 are lower and/or sensitivity of human capital accumulation to parental earnings lower. In this respect, in a country where there is a market-oriented educational system, it is expected that educational attainment will be strongly related to the income level of the family (because of credit constraints), and access to education will be difficult for the kids of households that placed at the bottom of the income distribution. Hence, the elimination of credit constraints and increasing public provision in education is expected to decrease educational inequality.

In economics, educational attainment is often expressed in terms of the number of years of schooling required to achieve a particular degree. The relationship between parent and child years of schooling can then be analyzed using a single regression or correlation coefficient. In other disciplines, educational outcomes are more commonly ranked, for example, by ranking degrees. The choice of approach relies on several factors, such as the focus of the study and whether the relationship between parent and child years of schooling can be accurately described using a linear function.

One significant limitation in the interpretation of educational outcomes is that they can be coded in separate ways, which can create challenges when attempting to compare them. For example, the meaning of "twice as much" education is not as clear or objective as it is for income. Educational degrees may not be comparable across countries or over time, and this issue is not resolved when educational degrees are converted into years of schooling. In addition to this issue, education is generally easier to measure than income and is more frequently reported in intergenerational data. Most people complete their education in their twenties, which enables it to be accurately captured through a single measurement early in life, regardless of their current employment status.

Therefore, even in countries where income data is available, educational outcomes are often used in settings. For example, combining educational and income information can provide a more current assessment of socio-economic mobility for young generations (Chetty et al., 2014). Educational statistics are also used to extend the scope of cross-country comparisons (Hertz et al. 2007). One limitation of historical or trend analysis is that there may be limited variation in educational outcomes in earlier generations, in which only a small proportion of the population may have received more than basic schooling. This can affect the comparability and precision of estimates.

In this context, the first studies on intergenerational educational mobility reveal the fact that there is a strong association between parental education level and a child's educational attainment (Dearden et al., 1997; Checchi et al., 1999, 2008; Behrman & Rosenzweig, 2002; Black et al., 2005; Björklund & Salvanes, 2011). On the other hand, recent studies on intergenerational educational mobility concentrate on explaining how much of the high association between education levels of parent and child is attributable to the genetic transmission of ability (nature) and environmental factors provided by parents such as non-cognitive abilities, income, social networks, and neighborhood (nurture).

To identify this causal relationship, three different strategies stand out in the literature. The first one is using samples of twins to capture children's abilities (Behrman & Rosenzweig, 2002, Holmlund et al., 2008, Bingley et al., 2009), secondly using the samples of families with adopted children to differentiate of parent's ability (Plug, 2004, Björklund et al., 2006, Haegeland et al., 2010), thirdly using various reforms of the education system as a source of exogenous variation in parental education (Chevalier, 2004, Oreopoulos et al., 2006, Maurin & McNally, 2008). According to the results of these studies, at most half of the educational outcome correlations between parents and descendants can be considered as causal effects, more specifically, common family factors. From the nature vs. nurture perspective, it is difficult to find support for the view that one is particularly more important than the other and the common result from both strategies is that both nature and nurture are effective in children's educational outcomes (Björklund & Salvanes , 2011).

From another perspective, starting with Hertz et al. (2007), another branch of the literature aims to analyze and understand the variation of intergenerational educational mobility across countries (Chevalier et al., 2009; Narayan et al., 2018; Emran & Shilpi, 2019; Leone, 2019; van der Weide et al, 2021). According to Hertz et al. (2007), on average, Scandinavian countries have the highest level of intergenerational mobility, and Latin American countries are the least. Studies by Narayan et al. (2018) and Leone (2019) verify this finding and underline two significant mechanisms contributing to variation among countries. First, in rich countries, success in educational attainment is higher than in poor countries. Second, in poor countries, once an individual reaches the tertiary educational level the transmission of privileges is higher than in rich countries.

On the other hand, using education as a measure of intergenerational mobility has a critical weakness in both within a country and between country comparisons, due to the different educational qualities (Leone, 2019). Moreover, there has been increasing interest in the field of study and institutional quality of educational careers, especially in terms of how these factors can impact lifetime earnings. Kim et al. (2015) have shown that the earnings gap between college graduates with different majors in the United States can be larger than that between high school graduates and college graduates. Additionally, there are significant differences in the quality of institutions within each field, leading researchers to study the impact of attending elite or prestigious institutions versus less prestigious ones on social mobility and outcomes (Attanas io & Kaufmann 2009; Torche, 2011; Chetty et al. 2017; Monsen, 2018; Thompson, 2019). Accordingly,

two important results stand out in Chetty's (2017) study. First, the likelihood of attending the most prestigious universities varies significantly by family income, with children whose parents are in the top 1% of the income distribution being 77 times more likely to attend an Ivy League university than children whose parents are in the bottom 1% of the income distribution. However, top-tail mobility rates (from the bottom 1% to the top 1%) are highest at elite universities such as Ivy League universities.

In this respect, intergenerational educational mobility literature in Turkey has recently started with Tansel (2015). Using the Adult Education Survey conducted by TURKSTAT in 2007, the study states that the intergenerational education correlation coefficient between the years of education completed by the descendants and the fathers did not decrease significantly over time. Moreover, according to the results, the probability of the descendants having a university degree was positively and significantly related to the educational level of the fathers' educational level, and the daughters face worse educational expectations than sons in achieving both high school and college degrees. Like Tansel (2015), Bakış (2017), using European Social Survey data, calculates intergenerational educational mobility in Turkey and compares his results with European Union countries. According to his results, intergenerational educational mobility in Turkey proves to be relatively low, yet this gap between Turkey and EU countries closes for younger generations. Akarçay-Gürbüz and Polat (2017) is another study that deals with intergenerational mobility models in Turkey. By employing census data from 1990 and 2000, they perform two-stage IV-probit and two-stage residual inclusion regressions (2SRIs) to address the possible problem of neglected variable bias that could affect the estimated marginal impact of parental education on a child's education. Comparing the results obtained with an intergenerational probit regression with those obtained by IV-probit means that the marginal effect of paternal education on a child's educational outcome is exaggerated in the usual probit regression due to neglected variable bias. When the authors define educational attainment as a categorical variable and rely on the 2SRI methodology, they find that the usual probit regression underestimates the marginal effect of maternal education and exaggerates the effect of paternal education.

Aydemir and Yazıcı (2019) by using microdata from their own field research, estimate the intergenerational education correlation and regression coefficients for various subregions of Turkey and examine how regional development and regional educational inequality affect intergenerational educational persistence between parent and child. Aydemir and Yazıcı (2019) argue that when compared to developed countries, the degree of intergenerational education mobility is relatively low in Turkey and the size of the relationship between parents and child's education is inversely related to the regional development level. The authors also find a negative and significant relationship between the degree of intergenerational mobility and the educational inequality of parents across regions. Öztunalı and Torul (2019), in addition to the evolution of intergenerational educational persistence across generations, analyze the relationship between within-cohort educational inequality and intergenerational educational mobility, by using the wave 2011 of Survey of Income and Living Conditions dataset of TURKSTAT. Their findings indicate that intergenerational educational persistence decreases, and educational inequality

decreases over younger birth cohorts, which implies it is accurate to show a time series analog of the Great Gatsby Curve relationship between inequality and mobility.

3. Data and Methodology

3.1. Data

In this study, we use micro-data from the Adult Education Survey (AES)'s 2007, 2012, and 2016 waves provided by the TURKSTAT. The Adult Education Survey (AES) covers adults' participation in education and training. AES provides rich information on respondents' participation in formal education, non-formal education, and training, informal learning, the volume of instruction hours, characteristics of the learning activities, reasons for participating, obstacles to participation, access to information on learning possibilities and guidance, employer financing and costs of learning, self-reported language skills. Besides, it provides information about the educational outcomes of respondents' parents through a questionnaire conducted in a retrospective fashion. Thus, it allows the estimation of intergenerational transmission without co-residency bias. The first wave of AES includes information on individuals who were born between 1943 and 1982 (Ages 25-64), but the second and third waves include the 18-25 age group and individuals above age 65. In this work, we exclude the 18-24 age group from the 2012 and 2016 waves. Thus, this age group can be considered the one in which the education phase has been completed.

Locations with a population over 20,000 are defined as urban and locations with a population of 20,000 or less are defined as rural locations in the survey as defined by State Planning Organization in 1982. However, due to legal modification that took place in March 2014, 30 provinces in Turkey have become metropolitan municipalities and rural areas of these provinces become neighborhoods within urban areas by definition. Consequently, the rural population in these cities has decreased by 21% to 3%. To ensure representativeness, TURKSTAT no longer provides information about rural-urban breakdown as of the 2016 wave. Therefore, the data set published in 2016 is not used in the context of intergenerational mobility across the urban-rural divide in the following section of the study. As a result, the total number of observations for three waves of AES is 71,705 and for first two waves of AES is 55,348.

Although the education level of respondents was given with ISCED (International Standard Classification of Education) classification, the educational level of parents provided as a categorical variable in AES which was described as i) low education level (at most lower secondary), ii) intermediate education level (upper secondary) and iii) high education level (tertiary). As a result of this discordance, we are obliged to redefine the education variable of a child in accordance with parental education. Hence, for the ISCED categories of 1 – primary school, 2 – general lower secondary, vocational or technical lower secondary, primary education with addition of no formal education defined as "at most lower secondary". For the ISCED category of 3 – general upper secondary, vocational or technical upper secondary defined as "upper secondary". Finally,

for the ISCED categories of 5 – associate degree (2 or 3 years), 6 – bwachelor's programmes, 7 – master's programmes, 8 – doctorate defined as "tertiary".

Table 1. Share of Educational Levels of Child and Parents

Education (Obs. = 71,705)							
Birth Cohorts	**Share in Sample**	**At Most Lower Secondary**		**Upper Secondary**		**Tertiary**	
		Child	Parent	Child	Parent	Child	Parent
1943-1947	2.65	87.89	97.05	5.69	1.69	6.42	1.26
1948-1952	6.93	85.02	95.71	7.37	2.50	7.61	1.79
1953-1957	10.41	81.26	95.55	9.77	2.88	8.97	1.57
1958-1962	11.92	77.31	95.06	13.77	3.00	8.92	1.94
1963-1967	13.31	76.73	94.81	13.70	3.27	9.56	1.92
1968-1972	13.81	74.26	92.93	14.01	4.21	11.73	2.86
1973-1977	14.98	66.33	89.84	19.06	5.86	14.6	4.29
1978-1982	15.94	58.07	85.84	23.33	8.40	18.60	5.77
1982-1987	7.73	51.45	81.03	22.92	11.93	25.63	7.04
1988-1991	2.33	41.78	77.94	25.52	13.51	32.7	8.55

Table 1 delineates educational trends across distinct birth cohorts spanning from 1943 to 1991. Notably, there is a discernible progression in educational attainment over time. For instance, in the earliest cohort (1943-1947), 97.05% of parents had education up to lower secondary levels, but this figure diminishes in subsequent generations. Conversely, the percentage of parents with tertiary education increases steadily from 1.26% in the earliest cohort to 8.55% in the latest (1988-1991). Intergenerational shifts are evident, with educational levels for children surpassing those of their parents in later cohorts. This data suggests a positive trend in educational advancements across generations, indicative of societal progress and evolving educational opportunities.

3.2. Methodology

First, we start our educational mobility analysis with Markov Transition Matrices. There are three summary mobility indicators commonly used in literature. The first one is Prais/Shorrocks mobility index, and it captures the average probability across all educational outcomes that an individual will leave his/her initial class in the next period and defined as,

$$M_1 = \frac{m - tr(P)}{m - 1} \tag{4}$$

where m is number of educational outcomes and $tr(P)$ is the trace of transition matrix P

Second summary index is, Bartholomew index and gives the average number of educational classes crossed by all individuals and characterized as,

$$M_2 = \frac{m}{m-1}\left(\sum_i^m \sum_{j=1}^m p_{ij}|i-j|\right) \quad (5)$$

where p_{ij} is the probability of the child who educational background *i* moves to educational outcome *j* and $|i-j|$ is the distance between educational outcomes *i* and *j*.

Thirdly, Eigenvalue index measures the speed at which a child escapes their parent's educational level status (Richey & Rosburg, 2015).

$$M_3 = 1 - |\lambda_2| \quad (6)$$

where λ_2 is the second largest eigenvalue of transition matrix *P*. For all these summary mobility measures value of 1 implies perfect mobility and the value of 0 implies perfect immobility (Formby et al., 2004).

In the second part of the empirical analysis, similar to Öztunalı and Torul (2019), we employed ordered logit regressions to estimate the conditional educational intergenerational transition probabilities and persistence for each birth cohort. The econometric specification with the OLS methodology of previous intergenerational educational mobility literature (such as Tansel, 2015, Aydemir & Yazıcı, 2019), adapted directly from the income mobility literature, is based on strong modeling assumptions such as linearity, symmetry, cardinality, and monotony in the relationship between the years of education of children and their parents, moreover, it necessitates information provided as years of schooling continuously. These constraints implicitly assume that a year in higher education, a freshman year, or a year of non-graduation has the same marginal effects as other years of education, contrasting the well-known sheepskin effect in education (Öztunalı & Torul, 2019). Since AES provided education information as a categorical variable, using the conventional methodology of the income mobility literature is infeasible for this study.

In this sense, the general form of our model for intergenerational educational mobility is characterized as;

$$C_{it} = \alpha_1 P_{it} + \alpha_2 G_{it} + \alpha_3 U_{it} + \sum_{z=b.cohort}^{b.cohort} \alpha_z Y_{zit} + +\epsilon_{it} \quad (7)$$

where C_{it} is the educational attainment level of child *i* born in year *t*, P_{it} stand for educational attainment level of parent which defined as most educated parents' attainment level achieved by parents. For examining of gender differences, we also add dummy variable G_{it}, which takes value of 0 for daughters and 1 for sons. In addition, we also try to explore urban-rural variation by adding U_{it}, which takes the value 1 if the respondent living in an urban area and 0 for rural area.

As a last regressor set, we also control for cohort fixed effects via dummy variables Y_{zit} which takes the value 1 if the individual *i* is born in year z, and 0 otherwise.

After the estimation of regression coefficients and odds ratios, we construct intergenerational persistence variable as follows,

$$Persistence_t = \frac{\sum_{j=1}^{3} Pr_t(C = j|P = j)xN_t(P = j)}{\sum_{j=1}^{3} N_t(P = j)} \quad (8)$$

where $\Pr(C = j)$ and $\Pr(P = j)$ is probability of child and his/her parents' educational outcome *J* and $N_t(P = j)$ is the number of children in birth cohort *t* whose educational outcome of parent equal to *J*.

4. Results of Analysis

This section reports empirical results with the methodology defined in light of the above explanation. Firstly, we start with mobility measures which are calculated from Markov transitional mobility matrices. Next, we explore the evolution of the intergenerational educational persistence between parents and their offspring among cohorts. Finally, we will present and discuss the differences in intergenerational persistence over birth cohorts in gender and urbanization breakdown for both dimensions.

4.1. Transition Matrices

Prais/Shorrocks (M_1), Bartholomew (M_2), and Eigenvalue (M_3) mobility index results based on Markov Transition Matrix (P) presented in Table 2. According to the results, M_1 calculated as 0.59, these findings indicate lower mobility estimation with respect to Bakış's (2017) estimation of 0.8 based on the European Social Survey dataset.

Table 2. Intergenerational Educational Mobility Based on Markov Transition Matrix Indices

Type of Indices	General	Gender		Birth Cohorts				
		Sons	Daughters	1943-1952	1953-1962	1963-1972	1973-1982	1983-1991
M_1 – Prais/Shorrocks	0.595	0.623	0.572	0.580	0.597	0.588	0.624	0.661
M_2 – Bartholomew	0.226	0.239	0.215	0.222	0.228	0.224	0.237	0.261
M_3 – Eigenvalue	0.331	0.381	0.291	0.278	0.322	0.324	0.379	0.456

However, in line with previous empirical studies, intergenerational educational mobility is increasing across younger birth cohorts, Prais/Shorrocks index calculated as 0.58 for the oldest birth cohorts' group with respect to 0.66 for 25-34 age group. This result verified with

the Bartholomew index, the average jump in educational outcomes is higher for younger generations. It is calculated as 0.26 for the youngest birth cohort against 0.22 for the individuals born between 1943-1952. Additionally, the Eigenvalue index, which captures the speed of escape from the parental educatiownal background is higher for the 1983-1991 birth cohorts relative to the 1943-1952 birth cohort. It is calculated as 0.46 for the youngest birth cohort versus 0.28 for the oldest.

Another similar result to previous studies (Bakış, 2017; Tansel, 2015; Öztunalı & Torul, 2020), there is a gender differential in intergenerational educational mobility. Male descendants have higher educational prospects with respect to females. It is calculated as 0.62 for sons corresponding to 0.57 for daughters. The Bartholomew index results are 0.24 for sons with respect to 0.21 for daughters. As a last measure, the Eigenvalue index was calculated as 0.38 for sons relative to 0.29 for daughters.

4.2. Intergenerational Educational Mobility Dynamics

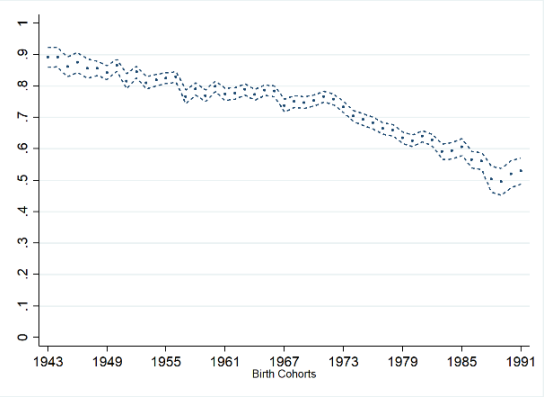
Odds ratios calculated from generalized ordered logit regression results are presented in Table 3. Based on the findings of the parental educational level of a child affects educational attainment positively, as expected. More openly, for an individual wo has a high parental educational background, the odds of higher educational attainment are approximately 5.39 times greater than with respect to low and intermediate educational attainment. This result is more excessive for the probability of high and intermediate educational attainment level. The odds are 8.02 times greater with respect to probability of low educational attainment.

Figure 1 panel (a) shows the intergenerational educational persistence across birth cohorts, which can be interpreted as the measure of intergenerational immobility. It captures the probability of a randomly selected child from a particular birth cohort having the same educational outcome as his/her parent, which is calculated from equation (5). According to findings, persistence decreases over the younger generations. Specifically, it decreased to 53% for the cohort born in 1991 from %89 for the cohort born in 1943. On the other hand, the share of low parental educational level families in Turkey is very high in the older birth cohorts and this share tends to decrease over time. More precisely, 96% on the average for the cohorts born between 1943-1953 to %51 for the cohorts born between 1981-1991 (panel (b)). Thus, the decreasing trend of intergenerational educational persistence stems from this change in the family types over birth cohorts. For this reason, in panel (c) of Figure 1, we distinguish the persistence types over the birth cohorts. According to the findings, the predicted probability of staying low educational level conditional low parental educational level decreases to 56% for the cohort born in 1991 from 90% for the cohort born in 1943. The probability of remaining intermediate educational levels for the descendants having an intermediate parental educational background is almost constant over the birth cohorts. In addition, the probability of keeping the same status for children with high parental educational backgrounds substantially increases across birth cohorts.

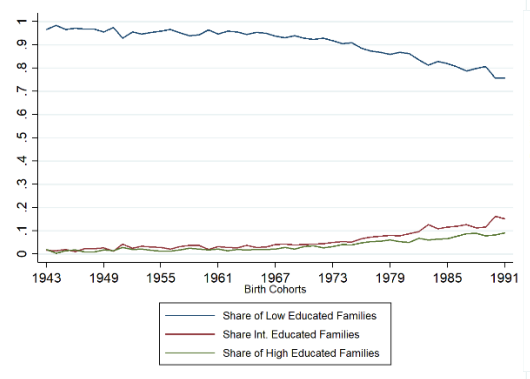
Table 3. Intergenerational Educational Mobility Generalized Ordered Logit Regression Estimation

Education Level of Child	Variables	Coef.	Odds Ratio	Rob. Std. Err.	z	P>|z|
High Educ. Level vs. (Low Educ. Level & Intermediate Educ. Level)	Educational Level of Parent	1.685	5.397	0.138	65.89	0.000
	Gender	-0.670	0.512	0.015	– 23.03	0.000
	Urban	-1.098	0.334	0.009	– 40.66	0.000
	Constant	-1.488	0.226	0.017	– 19.45	0.000
(High Educ. Level & Intermediate Educ. Level) vs. Low Educ. Level	Educational Level of Parent	2.083	8.030	0.286	58.56	0.000
	Gender	-0.749	0.473	0.010	– 35.92	0.000
	Urban	-1.098	0.334	0.009	– 40.66	0.000
	Constant	-3.827	0.022	0.002	– 35.54	0.000
	LR Chi-Square	10,832.0				
	Pseudo R-Square	0.1258				
	Obs.	55,348				

(a) Persistence



(b) Share of Family Types



c) Types of Persistence

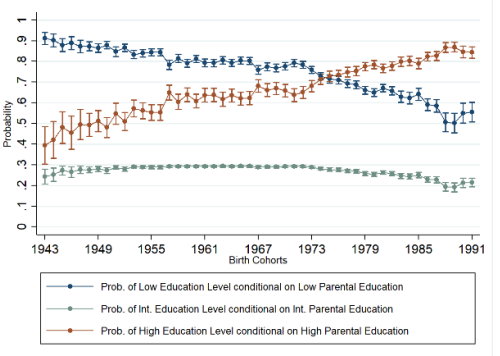
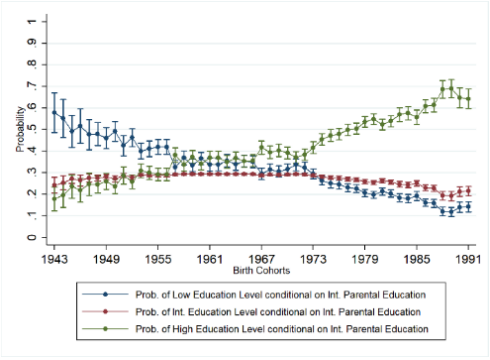


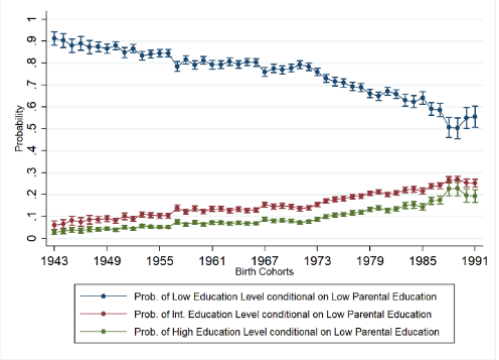
Figure 1. Intergenerational Educational Persistence

From another perspective, predicted probabilities of descendants' educational outcomes conditional on parental education are presented in Figure 2. According to panel (a), as mentioned above, the probability of low educational outcomes for the descendant's conditional on low parental education declines over younger generations. Following this finding, the probability of an intermediate educational outcome for the child who has a lower educational background increases to %25 for the 1991 cohort from 8% for the 1943 cohort. Similarly, the probability of an individual reaching high educational attainment who has a low parental educational background increases from 5% to %20 over the same birth cohorts. Panel (b) shows the predicted probabilities conditional on intermediate parental education. In this regard, the probability of low educational outcomes for the descendants shrinks across birth cohorts from 62% to 22%. In line with this, the probability of high educational outcomes increases over younger generations from 10% to 40%. Thirdly, panel (c) demonstrates the predicted probabilities of a child's educational outcomes conditional on a high parental education level. The probability of a low and intermediate educational outcome for the descendants who have a high parental educational background declines across birth cohorts. Particularly, for the cohorts born after 1985, results indicate that once an individual reaches the top educational outcome, the next generation maintains the same educational attainment.

(a) Conditional on Low Parental Education



(b) Conditional Int. Parental Education



(c)Conditional on High Parental Education

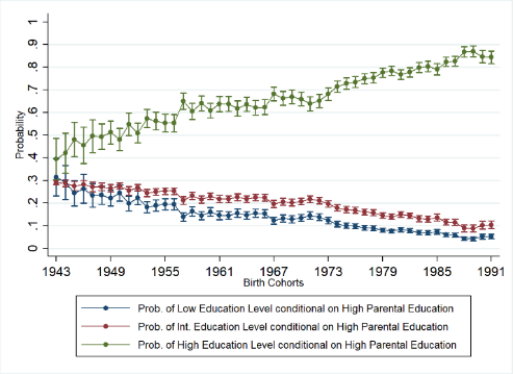


Figure 2. Conditional Intergenerational Educational Transition Probabilities

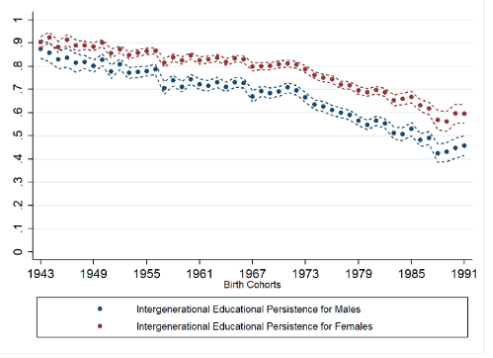
4.2.1. Intergenerational Educational Mobility and Gender

In this section, we focus on intergenerational educational persistence differences between male and female descendants. According to the results of Table 3, females are disadvantaged with respect to males. Specifically, the probability of higher educational attainment versus low and intermediate educational attainment for females are 0.51 times lower with respect to males given that all the other variables in the model are held constant.

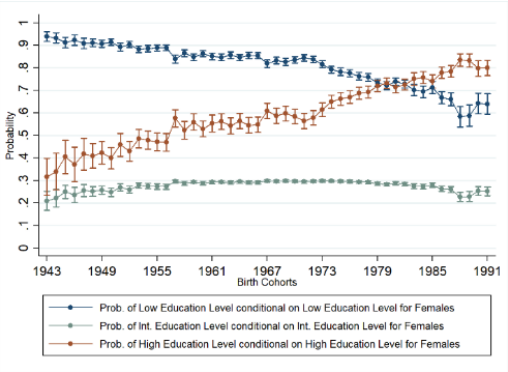
Figure 3 panel (a) presents the intergenerational educational persistence across birth cohorts for males and females. As mentioned above, persistence between child and parents declines across birth cohorts for both males and females. However, the persistence level is substantially higher for females compared to males. More openly, the persistence decreases from 86% to 47% for males from the 1943 birth cohort to the 1991 birth cohort in contrast to %92 to 58% for the same birth cohorts. Additionally, there is an increasing gap between females and males in persistence over time. This divergence between males and females arises from the distinction between persistence types. The probability of remaining in the low educational level who has a low educational background decreases around 50% for the 1991 birth cohort of males from 90% for the 1943 birth cohort in contrast to around 80% from 95% for females. This result implies that there is still large immobility for females from low educational backgrounds even younger generations. Additionally, the probability of high educational outcomes conditional on the high parental educational background is 90% for males with respect to 80% for females in the 1991 birth cohort.

Figure 4 demonstrates predicted probabilities of descendants' educational outcomes conditional on parental educational background for males and females. According to panel (a) of Figure 4, the probability of reaching intermediate and high educational levels for the descendants of low educational backgrounds raises 5% and 3% to 25% respectively for males over the younger birth cohorts. On the other hand, for females, the same probability raises %18 for intermediate education level and %10 for high education level from 3% and %2 respectively. Although the probability of high educational outcome conditional on the intermediate educational attainment of parents increases from 20% to 65% for males in 1943 birth cohorts to 1991 birth cohorts, the same probability for females raises 10% to %40.

(a) Persistence



b) Persistence Types for Males



(c) Persistence Types for Females

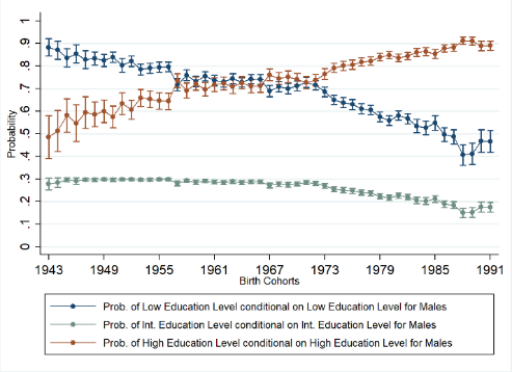
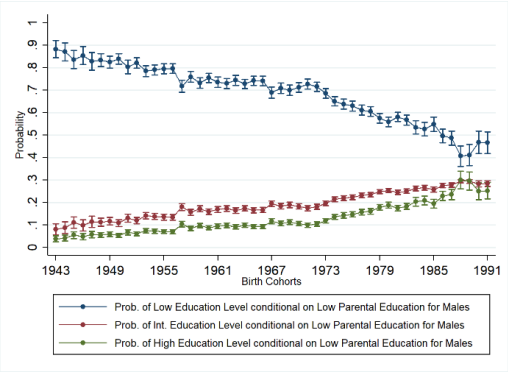
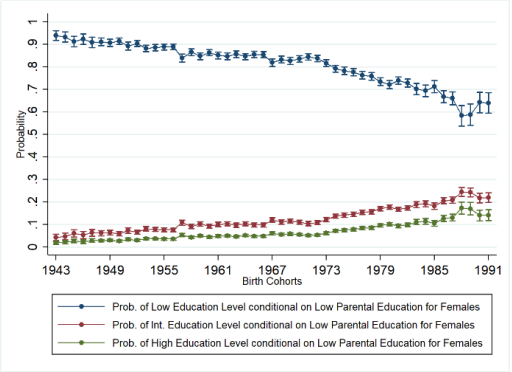


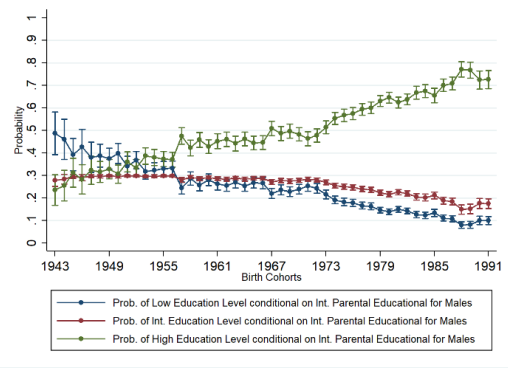
Figure 3. Intergenerational Educational Persistence by Gender Breakdown

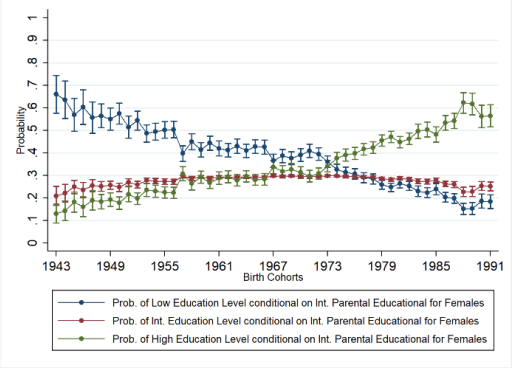
(a) Conditional on Low Parental Education





(b) Conditional on Intermediate Parental Education





(c) Conditional on High Parental Education

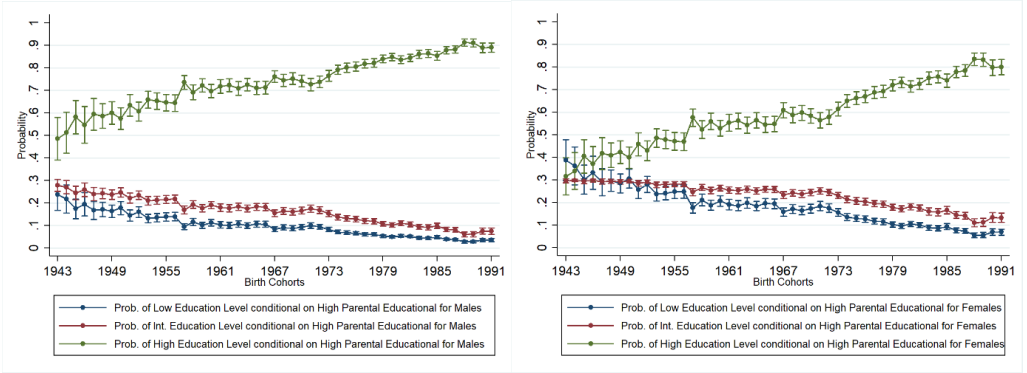


Figure 4. Conditional Intergenerational Educational Transition Probabilities by Gender

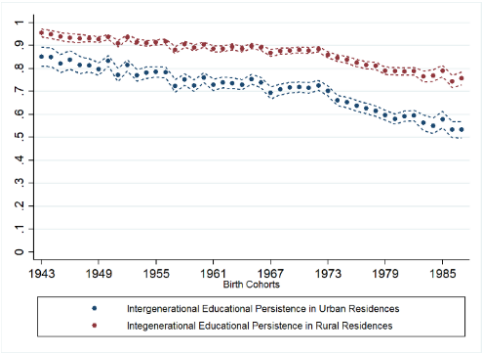
4.2.2. Intergenerational Educational Mobility and Urbanization

As a last step of intergenerational educational mobility, we focus on intergenerational educational persistence differences between urban and rural residencies in this section. According to Table 3, persistence is higher in rural residences relative to urban areas as expected. The odds of higher educational attainment with respect to low and intermediate educational attainment for rural residences are approximately 0.33 lower in rural residencies given that all the other variables in the model are held constant.

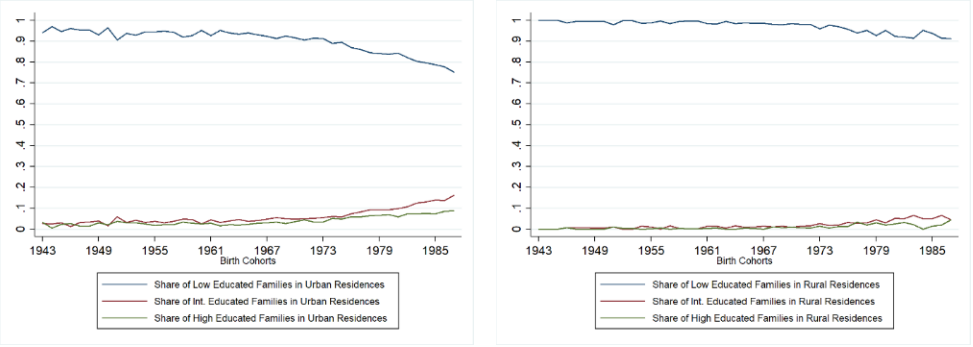
According to the results in Figure 5 panel (a), the intergenerational educational persistence across birth cohorts for urban and rural residencies declines across birth cohorts. However, the persistence level is still high for rural areas with respect to urban areas. More clearly, persistence decreases from 87% to 60% in urban areas from the 1943 birth cohort to the 1991 birth cohort in contrast to %92 to 72% for the same birth cohorts. Additionally, there is an increasing gap between urban and rural residencies in persistence over time. This divergence between urban and rural areas stems from the distinction between the share of family types of these residencies. The share of families that have low educational attainment is 100% for the individuals born in 1943 and this share decreases to 91% in 1991. In contrast to this result, the same share decreased by %75 in 1991 from %94. In this regard, the probability of remaining in the low educational level who has a low parental educational background decreases by around 60% for the 1991 birth cohort in urban residencies from 90% for the 1943 birth cohort in contrast to around 82% from the 95% for rural residencies. Similar to the distinction between genders, this result implies major immobility for rural residences even for younger generations. However, in urban residencies probability of high educational outcome conditional on high parental educational background increases 50% to 85% for 1943 to 1991 birth cohorts. The same probability for rural areas is more excessive which is an increase from 25% to 75%. Figure 6 demonstrates predicted probabilities of a child's educational outcomes conditional on parental educational background in urban and rural residencies. According to panel (a) of Figure 6, the probability of reaching intermediate and high educational levels for the descendants of low

educational backgrounds increases by 5% and 3% to 25% and 18% respectively in urban residencies over the younger birth cohorts. However, in rural residencies, the same probability raises %18 for intermediate education level and %8 for high education level from 2% and %1 respectively. Although the probability of high educational outcomes conditional on the intermediate educational attainment of parents increases by 18% to 60% in urban residencies for the 1943 birth cohort to 1991 birth cohort, the same probability in rural areas raises 8% to %35.

(a) Persistence



(b) Share of Family Types of Urban and Rural Residences



(c) Types of Persistence

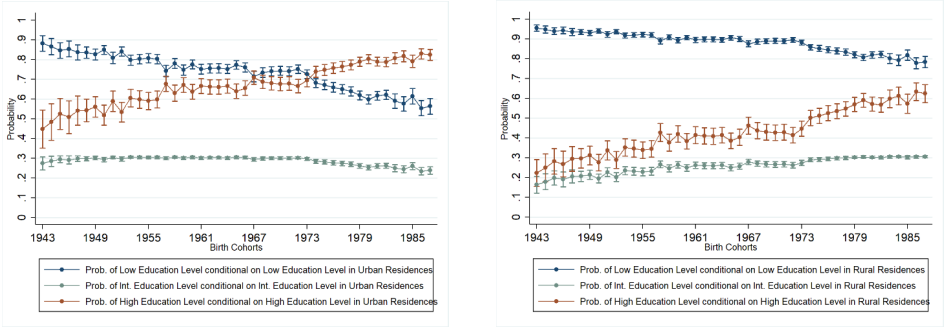
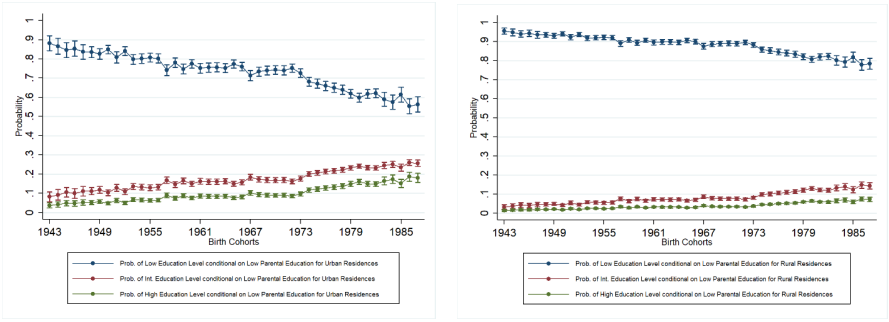
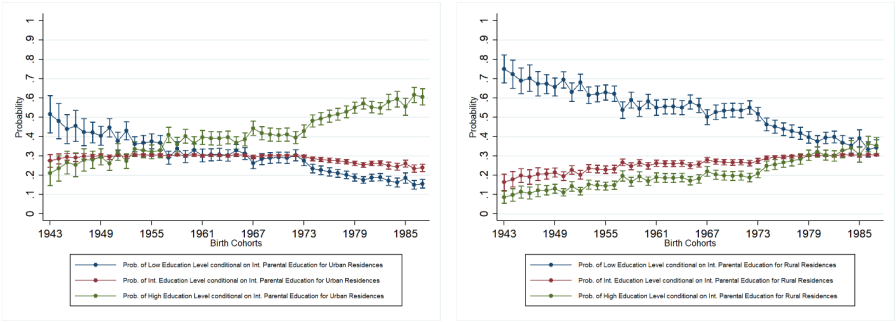


Figure 5. Intergenerational Educational Persistence of Urban and Rural Residences

(a) Conditional on Low Parental Education



(b) Conditional on Intermediate Parental Education



(c) Conditional on High Parental Education

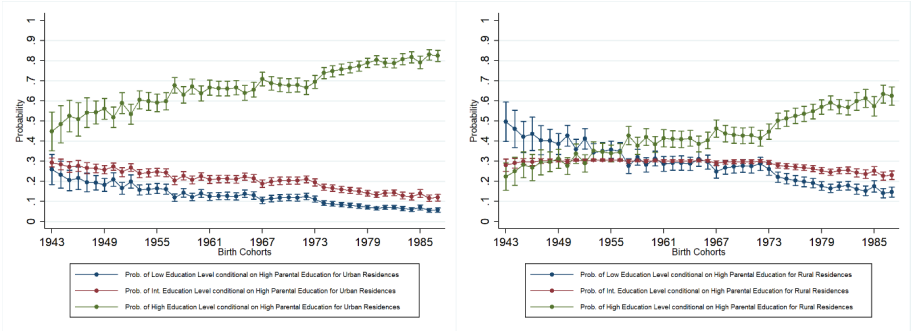


Figure 6. Conditional Intergenerational Educational Transition Probabilities of Urban and Rural Residences

5. Conclusion and Discussion

In conclusion, this study contributes to the emerging literature on intergenerational mobility in Turkey, utilizing data from the Adult Education Survey (AES) provided by TURKSTAT. Our examination of the complex dynamics governing the transmission of socio-economic status across generations underscores the profound implications for societal welfare, economic efficiency, and the realization of equal opportunities.

Since the establishment of the Turkish Republic in 1923, the modernization of the education system took place with the Law on Unification of Education (1924) and free five-year primary education has been compulsory for all citizens in public schools consequently. Undoubtedly, it can be asserted that this initial step serves as the primary trigger of intergenerational mobility. Prior to 1997, the educational system was organized as five years of primary school, three years of middle school, three years of high school, and tertiary education. With the passage of reform legislation in 1997, compulsory primary education was extended to 8 years, and secondary education was restructured as general, vocational, and technical high schools. In 2012, the latest major reform took place, and compulsory education extended to 12 years and divided into three levels of four years each (4+4+4). In accordance with the reforms in compulsory education, educational development statistics and schooling rates have improved since the establishment of the country. As a result of this, Turkey has experienced one of the fastest increases in educational participation among OECD countries. By 2010, primary and secondary school enrolment had reached the OECD average and by 2015 it was universally accessible, a remarkable achievement given the continued increase in the school-age population. The most significant increase was among 15 – to 19-year-olds (high school students), with enrolment rates increasing by 70% between 2005 and 2015. While Turkey's high school enrolment rate remains relatively low among OECD countries (83% compared to an average of 90% in 2020), it is relatively high compared to other upper middle-income countries (60%) (UIS, 2023). As of 2021, 34% of individuals aged 15-19 attend general secondary education, while 25% are enrolled in vocational secondary education in Turkey. In addition, 1% attend lower secondary education programs and 11% attend higher education. In contrast, the OECD average shows that 37% of students are enrolled in general upper secondary programs, 23% in vocational upper secondary programs, 12% in lower secondary programs and 12% in higher education programs (OECD, 2023). This significant enrollment growth has resulted from proactive policies aimed at expanding educational resources, reducing barriers to access, and improving efficiency in the education system. Notable initiatives include significant investments in school infrastructure, the introduction of an electronic student management system in the early 2000s, and the implementation of cash transfer programs and awareness campaigns to increase the participation of girls and socio-economically disadvantaged groups (Şaşmaz, 2015). Mean years of schooling reached 7.87 and 9.41 years in 2019 for females and males with respect to 1.32 and 3.03 years in 1975. The adult illiterate rate decreased by 2.5% in 2019 from 38.9% in 1975 (UIS, 2023). As of 2021, there are 204 universities, 1,828 faculties, and 1,332 vocational schools in Turkey. In this sense, the gross enrollment ratio in tertiary education increased to 115% in 2019 from 5.1% in 1971 (UIS, 2021) [1].

The significant educational expansion that Turkey has experienced since its founding requires emphasizing the distinction between absolute and relative in the literature on intergenerational mobility. Absolute mobility assesses the overall progress of all children relative to their parents, closely linked to structural changes and overall economic growth (e.g. changes in compulsory

1 Gross enrollment ratio may exceed 100% as it includes students who are older or younger than their grade level due to early or late entry and grade repetition (UIS, 2021).

education, changes in occupational or class structure). This can be measured by examining the proportion of children who achieve higher living standards than their parents as adults. In contrast, relative mobility, often referred to in sociology as "social fluidity", measures the extent to which an individual's economic status is related to the economic status of their parents. This approach abstracts from overall economic development and structural changes. In this study, the concept of intergenerational persistence is related to absolute mobility figures due to data limitations.

In this context, the research results underline three points. Firstly, for an individual with a higher parental educational background, higher educational attainment is greater than for an individual with a low and intermediate parental educational background. In addition, the probability of having the same level of education as the education level of the family, in other words, persistence declines over birth cohorts. To illustrate, the persistence rate dropped from 89% for those born in 1943 to 53% for those born in 1991. This is driven by the educational expansion that has taken place in the country, the prevalence of families with low parental education is notably high in older birth cohorts in Turkey, but this trend appears to decrease over time. To elaborate, the average percentage decreased from 96% for cohorts born between 1943-1953 to 51% for cohorts born between 1981-1991.

Secondly, the level of persistence is notably high among females compared to males. Specifically, for males, persistence drops from 86% to 47% between the 1943 and 1991 birth cohorts, while for females, it decreases from 92% to 58% over the same periods. Moreover, a growing disparity in persistence between females and males is observed over time. This divergence is attributed to differences in persistence types. The likelihood of remaining in a low educational level for males with a low educational background decreases by approximately 50% for the 1991 birth cohort, compared to a decline from 90% to around 80% for females from the 1943 to 1991 birth cohorts. This finding suggests substantial immobility for females with low educational backgrounds, even among younger generations. Additionally, in the 1991 birth cohort, the probability of achieving high educational outcomes, given a high parental educational background, is 90% for males, contrasting with 80% for females.

Thirdly, the intergenerational educational persistence in both urban and rural areas shows a decline across different birth cohorts. However, the persistence remains notably higher in rural regions compared to urban areas. To elaborate, in urban settings, persistence decreases from 87% to 60% from the 1943 birth cohort to the 1991 birth cohort, while in rural areas, it decreases from 92% to 72% over the same periods. Moreover, there is a growing disparity in persistence between urban and rural residences over time. This divergence is attributed to differences in the distribution of family types in these areas. The percentage of families with low educational attainment is 100% for individuals born in 1943, decreasing to 91% in 1991 in urban areas. In contrast, the same percentage decreases by 75% in rural areas from 94% to 1991. Consequently, the likelihood of remaining in a low educational level for individuals with low parental educational

backgrounds decreases by around 60% for the 1991 birth cohort in urban areas, contrasting with a decrease from 90% to around 82% for rural areas between the 1943 and 1991 birth cohorts.

Assuming that parents aim to maximize their children's incomes alongside their own consumption, it is generally anticipated that private investments in children's human capital will increase with both parental income and parental human capital (Becker & Tomes, 1979, 1986; Loury, 1981). Consequently, offspring born to highly educated parents are expected to enjoy a twofold advantage. They not only benefit from exposure to their parents' elevated human capital but also from the higher monetary investments made by their parents in their human capital (Guryan et al., 2008; Ramey & Ramey, 2010; Duncan & Murnane, 2011). When children born to educated parents and parental investments in their human capital complement each other meaning the efficiency of investments in children's human capital increases alongside income they experience even greater advantages. This assumption appears reasonable, as indicated by various studies (Lareau, 2011; Heckman & Mosso, 2014). They may reside in neighborhoods with superior schools, facilitating interaction between their children and similarly advantaged peers. Additionally, they can provide support with homework, introduce them to books, engage in educational games, arrange private lessons, and more. This situation implies that the persistence of human capital across generations will strengthen as incomes increase. Credit market imperfections may further exacerbate the intergenerational transfer of human capital, potentially reducing intergenerational mobility, particularly for families at the lowest end of the income distribution. Limited access to credit for low-income parents investing in their children may lead to the transmission of lower levels of human capital from one generation to the next. Restuccia and Urrutia (2004) discovered that around 50% of intergenerational earnings continuity could be explained by parents' investments in their children's education. Therefore, recognition of societal investments in the educational sphere wields substantial influence not only on economic prosperity but also on the cultivation of a more equitable distribution of opportunities, thereby advancing principles of social justice. Consequently, our study advocates for targeted policies aimed at mitigating educational inequalities, with a view towards fostering a society where individuals are empowered to transcend the circumstances of their birth.

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