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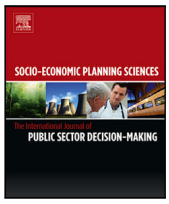

Intergenerational transmission of disadvantages in the Italian labour market

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ABSTRACT

The equity of a country is commonly assessed by examining the distribution of economic resources, access to higher education, and positions of societal influence relative to family socio-economic background. This study investigates the mechanisms perpetuating inequalities in the Italian labour market by analysing how family background influences educational attainment and subsequent labour market outcomes. Using the innovative AdSilc database, which integrates administrative and survey data on socio-economic backgrounds, we employed Generalized Path Analysis to explore complex relationships among exogenous, mediating, and endogenous variables. Incorporating the Heckman selection model addressed potential biases related to labour market participation. Additionally, we utilized generalized latent variable models for ordinal data to define family socio-economic status. Our findings underscore a pronounced intergenerational transmission of inequalities and a persistent wage gap across all cohorts analysed. Growing up in an advantaged family not only enhances educational attainment but also influences divergent labour market outcomes observed upon entry and after ten years of career progression.

1. Introduction

In absolute terms, the past few decades have seen substantial upward mobility in most OECD and emerging economies: we live better than our parents did, we benefit with higher income levels, better educational opportunities, improved housing along with enhanced quality of services. However, this progress is often accompanied by increasing levels of inequality [1,2] and reduced intergenerational social mobility [3]. Moreover, relative mobility has become a significant topic in public debate. Certain groups are advancing more slowly on the ladder of economic and social progress. Individuals born into families at the bottom of the economic ladder have limited chances to move upward, while those born into wealthier families are less likely to experience downward mobility a phenomenon often referred to as 'sticky floors' and 'glass ceilings' [4].

Therefore, it has become evident that improving intergenerational mobility is closely linked to equity in educational systems [2]. The equity of a country is commonly measured by considering how economic resources, access to higher educational levels, and apical positions in society, are related to family socio-economic background [5]. Policies based on equity aim to eliminate barriers to attaining high-level positions and rectify disparities among social groups stemming from initial advantages or disadvantages [6]. However, due to a complex system of relationships, education does not always play the role it should in a modern, democratic country. In this context, it has become relevant to assess how much promoting policies aimed at creating a more equitable educational system could provide individuals with greater opportunities in the job market in terms of occupational outcomes.

Economic and sociological literature differ in the approaches used to study intergenerational mobility. Economic literature focuses on the transmission of the position in the distribution of income from parents to children using intergenerational earnings elasticity measures, wage persistence measures, etc [7,8]. On the other hand, sociological literature concentrates on the transmission of social positions from parents to children, measuring it by educational level, social class, prestige of the occupation, and the mechanism of intergenerational transmission of socio-economic advantages/disadvantages (for an in-depth discussion on different perspectives on this issue see [9,10] and references therein). Due to the lack of databases that simultaneously include data on income, wages or earnings, and individual and parental characteristics, these two approaches rarely intersect. To the best of our knowledge, no previous research has attempted to measure in terms of occupational outcomes the intergenerational transmission of disadvantages and the wage persistence gap from parents to children over time. This is a considerable gap in knowledge. Moving from this

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framework in this study we provide an assessment of the family support to the future career and their returns not only in terms of education but also wage differences over time (after 10 years). The main aim of this work is to test the roles played by the socio-economic conditions of the family of origin in predicting children's achievement of a high level of education and subsequent outcomes in the labour market. Namely, the main research questions regard the influence of the socio-economic conditions of the family of origin on educational attainments and occupational success at different points across individuals' work history, and in particular:

- is there an effect of family socio-economic status on individual educational achievement?
- what are the short- and long-term intergenerational economic returns of family of origin on daily wage monitored at the entrance and after ten years?

To tackle such a complex system of relationships across the involved exogenous, mediators and endogenous variables, we adopt a Generalized Path Analysis which incorporates the Heckman selection model to account for the presence of selection bias due to the participation in the labour market, and we summarize the family socio-economic status using generalized latent variable models for ordinal data.

The paper has the great advantage of relying on the innovative and rich AdSilc data, starting from Silc data related to the 2011 wave, which has been merged with INPS data to follow the evolution of occupational outcomes until 2018. This unique dataset has the plus of having both quantitative information longitudinally recorded by INPS (on wage, hours of work, and type of contract, etc.), and also information on the situation of parents when the individual was 14 years old (module on the intergenerational transmission of disadvantages) coming from Silc *ad hoc*.

The paper is organized as follows. Section 2 describes the main theoretical framework on which the study relies with particular reference to the Italian case. Sections 3 and 4 present the research strategy and the AdSilc data. Section 5 outlines the modelling approach. Section 6 provides the main empirical evidence of the analysis, while Section 7 discusses the results and offers some policy suggestions.

2. Theoretical framework

Concerning the international literature on intergenerational mobility, we see substantial upward mobility in most OECD and emerging economies. In many countries, on average, individuals live better than their parents, benefiting from higher education and income levels. On average, they enjoy better socio-economic conditions and quality of life [11]. However, this relationship varies in countries with differing levels of development [2], with inequalities also rising at the regional level [12]. Indeed, as countries reach high levels of development, progress continues but necessarily slows down, because improvements in education, like those in health, cannot continue indefinitely.

The issue of relative mobility is gaining more and more relevance in the public debate, where the terms "sticky floor" and "glass ceilings" are now commonly employed to illustrate how mobility functions akin to a set of escalators, albeit with varying speeds [4]: individuals born into families at the bottom in terms of socio-economic status have little chance to move upward [13], while those from wealthier families face a low risk of moving downward. Consequently, the final relative positions of individuals within the population are not balanced. The literature agrees in recognizing that disadvantages faced by parents adversely affect their children's chances of success. Children from disadvantaged backgrounds struggle to advance, in many crucial aspects of life. On the contrary some studies suggest that upper-class families can leverage their social and economic resources to either compensate for their children's lower performances or to secure advantages in cases of equal performance [14].

In Italy, the level of education achieved by individuals is strongly affected by their parent's educational level [15]. Specifically, when examining using Silc 2019 data the proportion of individuals with tertiary education from highly educated and less educated families (where education is determined by the highest level achieved between the two parents) across three cohorts (1960–1970, 1970–1979, 1980–1989), a consistent pattern emerges suggesting stagnant social mobility within the country. The education persistence gap, defined as the difference in tertiary degree attainment between individuals from highly educated families and those from less educated backgrounds, varied over three decades. Specifically, for cohorts from 1960–1969, it was 57%, while for cohorts from 1980–1989, it decreased only very slightly to 55%. This data highlights that the percentage of individuals with a tertiary degree was constantly higher for individuals coming from highly educated families.

An important gap is also observed between individuals coming from highly educated families and those coming from middle-educated families, who register a percentage of individuals with tertiary education about 31%–32% points lower than the former. The first consequence of the differential opportunities in the labour market related to the achievement of higher education levels is well depicted by the difference observed in the employment rates of young people (20–34 years old) with tertiary and secondary education, with an advantage in 2021 of about +17.6% for those with tertiary education. Istat [16] has shown that even the hourly wage is considerably affected by the level of education achieved, with a difference in 2018 of about 7 euros per hour between people with secondary and a tertiary level education.

The reasons behind the observed inequalities are strictly linked to the inefficiency of the education system to guarantee equal opportunities behind families' socio-economic status [15].

The variability across geographical macro areas in access to preschool education, the differences in the time schools between institutions and the allocation of pupils in schools and classes according to parents' socioeconomic status since the early stages of their educational track are only some of the many shortcomings of the system. The Italian school system, therefore, seems to have the responsibility of not triggering school practices that prevent entry imbalances at school and ensure equal opportunities in the early stage of education, determining the establishment of mechanisms which, therefore, tend to guarantee the reproducing of intergenerational disparities, with the worst drawbacks in the most vulnerable areas of the country.

Educational data from Italy indicate that mechanisms of inequality transmission operate through multiple channels, closely tied to the influence exerted by the family of origin. This influence extends from entry into the education system to the selection of high schools, the attainment of competitive tertiary education qualifications, and the recognition these qualifications receive in the labour market in terms of institutional prestige. Additionally, family social networks, particularly in more vulnerable geographical areas, play a crucial role in supporting individuals during the early stages of their careers.

3. Research strategy

Numerous mechanisms are involved in the study of the intergenerational transmission of disadvantages. In this field many studies focus on the association between social origins and individuals' educational attainments (OE), others on the association between individuals' education and their occupational outcomes (EO) over time [17–19], and others on intergenerational transmission of socio-economic advantages/disadvantages (OD). In order to assess the complex system of hypothesized relationships across the exogenous and endogenous outcome variables involved, we depart from the so-called social origin–education–destination (OED) triangle that represents the basic processes underlying the intergenerational reproduction of inequality [10, 20].

According to this theoretical model, parental socio-economic status can impact their children's future in two primary ways: firstly, by affecting their labour productivity and attachment to the labour market, and secondly, by facilitating their success through the transmission of social norms such as work ethic or social networks.

The complex system of relationships across the exogenous, endogenous and mediator variables involved in the OED model can be easily represented using a Path Analysis Model. This model describes the role played by socio-economic conditions of the family of origin (O) on the achieved education level (E) and on the subsequent occupational outcome (D), allowing us to assess the extent of the intergenerational transmission of inequalities in the Italian context and how this process is mediated by the achievement of different educational levels.

To address the mediating role of education in the intergenerational reproduction of inequalities, we estimate the following: (a) the impact of social origin, monitored through parents' educational level and the economic conditions of the family, on respondents' level of education achieved (educational inequality); (b) the effect of education on individual work history (occupational returns to education); and (c) the influence of social origin on individual career paths, considering individuals' differences in the achieved education (social background on occupation).

The influence of socio-economic conditions of a family of origin on occupational success is analysed throughout various stages of individuals' work history patterns [21]. Specifically, we aim to estimate the intergenerational transmission of disadvantages and their long-term effects within the Italian context. This objective will be achieved by examining occupational income at two distinct points in individuals' lifetimes.

4. Data

Our analysis is based on AdSilc data, which is constructed by matching longitudinal information from administrative archives held by the Italian National Institute of Social Security (INPS) with survey data collected by the Italian National Institute of Statistics (ISTAT).

We use data from the 2011 ITSilc survey to leverage the special module on intergenerational transmission of disadvantages. Thus far, our analysis has encompassed comprehensive information regarding the family background when the interviewee was 14 years old, including the parents' educational attainment, their occupational status, and the family's economic hardships. We have integrated this data with the socio-economic circumstances of the offspring interviewed in Silc. Furthermore, we have incorporated their employment trajectory driven by the INPS administrative records, which include their entire careers from their entry into the labour market, occurring at any moment in the past until 2018 (the last update of the data).[1]

To focus our analysis on the outcome in the labour market, we excluded the youngest cohort (aged 25–29 years) because some of them may not have completed their education yet (and the information has been retrieved in the Silc waves, thus observable only retrospectively). Moreover, in our sample, over 95% of individuals began their first job experience after completing their studies before age 30, with an average age of 21.3 (standard deviation 4.8). Thus far, our attention has been limited on four cohorts of individuals, identified in 2011 in the following age classes: 30–34 years, 35–39 years, 40–44 years, and 45–49 years. Our sample consists of 7,986 individuals corresponding to the 4 cohorts (30–49 years old): 1962–66 (#2,187), 1967–71 (#2,317), 1972–76 (#2,153), 1977–81 (#1,329)

For each worker, we examine their individual work history at two points: during their initial job upon entering the labour market (which occurred every year in the past, and it has been observed after the achievement of the highest degree) and their contracted employment after 10 years from entry. As part of a sensitivity analysis, we also evaluated the situation after 9 and 11 years, and the results are stable enough to lead us to believe that we are observing a trend rather than a result linked to a particular moment in the career.

We are interested in modelling three independent variables: the level of educational attainment, evaluated in years of completed education (Y); the occupational outcome at the entrance into the labour market (W); and after 10 years (Z). We focus on the comparison between those individuals who never worked and those who have worked for at least 10 years.

We move from the hypothesis that the three independent variables are influenced by social origin, which encompasses the socio-economic status of both parents. This influence is manifested through the educational levels of both parents, their occupational status and the family's ability to face financial problems. This approach offers a distinct advantage owing to the enduring nature of education compared to the fluctuating nature of wages along the career. Previous studies have demonstrated a robust correlation between educational attainment and income levels across diverse nations [3], but the complex interrelation of the two over time, considering both direct and indirect effects, has rarely been considered.

The measurement of occupational outcomes W and Z involves the total gross salary paid to the worker by the employer, which is registered for social security purposes. We divided the individual total gross salary received by the working time to assess the gross hourly wages. This aspect, which we term as the offspring's income, is what we denote as *wages*.

The sets of predictors that we expect to be correlated with the three outcome variables (i.e., educational achievement and short- and long-term occupational attainment) are the following:

- factors related to the socio-economic status of the family of origin when the respondent was 14 years old are summarized in a Family of Origin Socio-Economic Status (SES). This index, developed using a Graded Response Model [22], synthesizes various family background characteristics [15] that are educational level of both parents, their ability to make ends meet, and Family Social Class.[2] The SES of the parents when the individuals were 14 years old is the main interesting independent variables in our models.
- individual characteristics (such as cohort of birth, gender, and geographical area).
- control variables such as reproductive behaviour (the number of children over the course of the career, interacted with gender for explaining differences in the participation in the labour market) and information related to the job at the time of entry into the labour market (see Table 1).

5. Modelling approach

The Path Analysis Model is a system of concatenated equations that allows us to simultaneously include the effect of family socio-economic conditions on children's educational achievement (Y) and on the consequent work history pattern. The classical path analysis model has been used to test intergenerational reproduction of inequalities [10,23]. The hypothesis tested is that exogenous variables, such as individual socio-demographic and family characteristics, influence educational attainment (Y), which in turn influences the probability

[1] The database has been created as a part of a Mospi research project, sponsored by the European Commission, with the purpose a function of the Treasury Dynamic Microsimulation Model (T-DYMM) owned by the Department of Treasury of the Italian Ministry of Economy and Finance, within the suite of models of Directorate I - Economic and Financial Analysis. We are very grateful to the Ministry of Economy and Finance for usage of the data.

[2] The Family Social Class is determined from the occupational status of the two parents, categorized using the International Standard Classification of Occupations (ISCO), as proposed in [15].

Table 1
Descriptive statistics.

Individual characteristics	%	Family of origin	%
Macroarea		*Educ(father)*	
North	51.0	Low secondary	76.7
Center	24.7	Upper secondary	18.3
South & Islands	24.3	Tertiary	5.0
Gender		*Educ(mother)*	
Male	52.0	Low secondary	80.9
Cohort		Upper secondary	16.0
1962–66	27.4	Tertiary	3.0
1967–71	29.0	*Ability to make ends meet*	
1972–76	27.0	With difficulty	12.5
1977–81	16.6	Some difficulty	31.4
Educ		Fairly easily	38.6
Low secondary	32.5	Easily	17.5
Upper secondary	47.6	*Family Social Class*	
Tertiary	19.9	Low	20.4
	mean (sd)	Medium Low	33.0
Years of education	11.9 (3.1)	Medium	19.0
		Medium High	11.2
		High	16.4

of entering or not entering the labour market and subsequent career paths. Thus, the model involves variables that are both exogenous and endogenous, as well as an endogenous mediator.

Considering that individuals may or may not enter the labour market, this classical path analysis model has been extended to address issues related to selection bias associated with the absence of wage (censoring) for individuals who do not participate in the labour market [24,25]. Thus, we first observe whether individuals entered the labour market and then examine their subsequent career paths, using daily wage at entry and after 10 years.

In Fig. 1 it is possible to see that X and M are both exogenous variables. X identifies the set of predictors related to demographic and socio-economic characteristics of individuals and their families of origin, whereas M is the set of moderator variables related to job information and the presence of children. The latter variables are involved only in explaining differences in the occupational outcomes at the entrance and after 10 years. Three endogenous outcome variables are observed in the modelling approach: the level of education achieved (Y), the labour market outcome in terms of wage at entrance W_1, and after 10 years, W_2. Y and W_1 are, in turn, mediating variables in subsequent equations.

In depicting the relationship between the socio-economic status of the family of origin, the level of education attained, and the outcomes in the labour market in terms of wages, the three equations in the path analysis model are interconnected in chronological order within the OED model.

The endogenous mediator outcome variable utilized to gauge education at the individual level is the average number of years required in Italy to attain the level of education expressed in the EUSilc survey through the International Standard Classification of Education (ISCED) code.

As anticipated the socio-economic status index (SES) has been building up by conducting a Graded Response Model which uses the following variables: the educational attainment of both the father and mother, their occupations in the International Standard Classification of Occupations (ISCO), and also include their capability to make ends meet. Based on the results, individuals have been classified into quartiles with low, medium-low, medium-high, and high socio-economic backgrounds.

The coefficients representing the relationships between individual and family origin characteristics (X) with education (Y) and wages ($W1$ and $W2$) enable us to examine the hypothesis of education as a significant equalizer across diverse backgrounds concerning occupational outcomes. The signs and magnitudes of these coefficients unveil the presence of unequal effects stemming from varying family backgrounds on occupational outcomes.

The Generalized path model analysis [26,27] involves three consecutive regression equations and incorporates a selection equation (Fig. 1). Namely, the first path aims to model the attained educational levels (Y). The second path has as dependent variable the daily wage at entrance (W_1) and it is affected by the latent variable L to incorporate the Heckman selection model. The latter allows to condition the daily wage upon entry into the labour market (W_1). Lastly, the third path models the daily wage after a span of ten years (W_2). The censored equation related to the outcome variables W (considered at both times) has been specified by jointly modelling the wage level (W specified in logarithmic terms) and the probability of working or not as a function of two external sets of predictors.

In Fig. 1, X represents the set of socio-demographic covariates (i.e., the family's socio-economic status, geographical area, cohort, and gender) which influence the level of education (Y). Wage levels (W_1) are specified as a function of the individual's level of education (Y), the family's socio-economic status (X), the individual's characteristics related to professional and reproductive choices (e.g., work experience, gender, marital status) (M), and the latent variable (L). The latter influences the probability of being in the labour market, modelled with a probit model.

The latent variable L is constrained to 1, as the value of its variance. The error terms are normally distributed: $\epsilon_1 \sim N(0, \sigma_1^2)$, $\epsilon_2 \sim N(0, \sigma_2^2)$, and $\epsilon_3 \sim N(0,1)$. ϵ_2 and ϵ_3 are allowed to be correlated with $cor(\epsilon_2, \epsilon_3) = \rho$, to account for censored information regarding wages, as the propensity to work or not influences the observed wage.

Both outcome variables related to the labour market outcomes (Selected and Daily wage) are correlated since both depend on the latent variable (L). The latter captures the association related to a common factor affecting the propensity to work and the wage, which needs to be taken into account to have unbiased estimates of the effect of education and family of origin's socio-economic status on daily wage.

Parameters related to the wage of the Generalized Path Model can be transformed into the Heckman metric

$$\beta_H = \beta \tag{1}$$

$$\sigma^2_{\epsilon_2^H} = \sigma^2_{\epsilon_2} + \eta^2 \tag{2}$$

$$\gamma^H = \gamma / \sqrt{\sigma^2_{\epsilon_2} + 1} \tag{3}$$

$$\rho_H = \eta / \sqrt{(\sigma^2_{\epsilon_2} + 1)(\sigma^2_{\epsilon_2} + \eta^2)} \tag{4}$$

where η denotes the coefficient of L in the equation of wage and γ are the coefficients of the selection equation. We included and fitted Heckman's selection model within the structural equation modelling framework, which supposes a bivariate normal distribution to model relationships within L and W using fully maximum likelihood estimation [28]. As described in [29], Heckman's model is a limited marginal maximum likelihood two step approach whose performance is influenced by the correlation between the error terms in the two equations: the higher the correlation, the greater the accuracy of using a full maximum likelihood information approach instead that a limited one. In case of solid departure from modelling assumptions methods, which relay on non parametric or semiparametric approaches would provide more reliable estimates.

6. Results

The results presented in Table 2 show the direct effect of covariates on each equation. Looking at the effect of macro geographical area the main findings show that higher educational attainment is less likely to be achieved in Southern Italy, where lower levels of wages are also

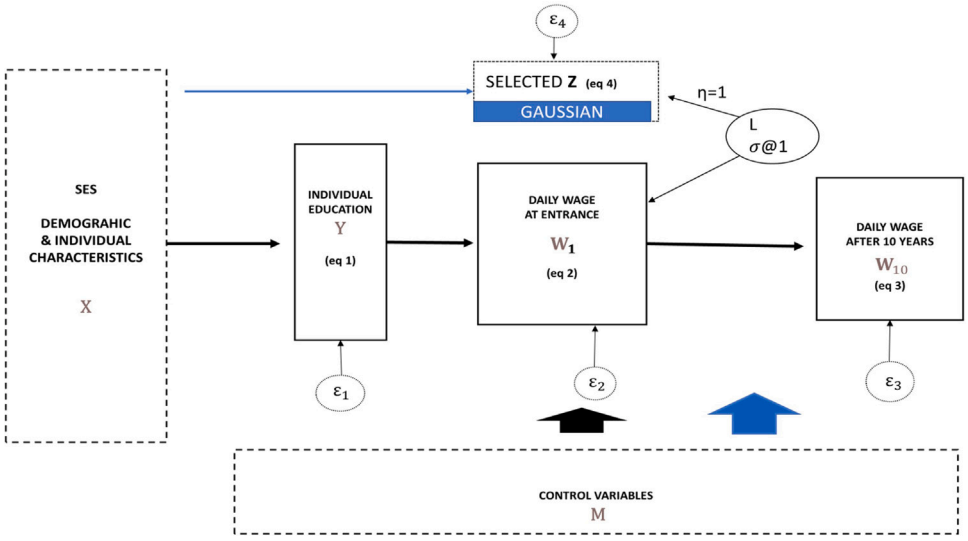

Fig. 1. Path analysis with Heckman model correction for intergenerational reproduction of inequality. The latent variable (L) influences the permanent participation in the labour market -modelled with a probit model ($Z = 1$ for those who work permanently, $Z = 0$ for those who have never worked)— and the daily wage along the career (log W_1 and log W_2). In the probit equation, the coefficient of the latent variable L is constrained to be equal to 1, thus, only its effect on W_1 is estimated.

observed. No significant differences arise from Center and North Italy. Findings from the first equation clearly show that the family of origin's socioeconomic status (SES) has a strong effect on the level of education achieved, which is, in general, higher in the last cohorts for female students from North and Central. Coefficients related to Eq. (2) show that in the short term, there are no differences in wages related to the family of origin's socioeconomic status, but there is a positive influence of the level of education achieved, as shown by the increase of about 3% in wage for any unit increase in years of education. However, the influence of the family of origin affects in a non-trivial way the long term differences in wages 10 years after they enter the job market. When examining gender differences, the model indicates that men, on average, achieve lower educational levels than women.

The selection equation, which models the probability of working, shows that the latent variable L negatively affects both the initial wage and the probability of working. This allows us to account for the effect of selection bias on the predictors and to identify the impact on wages, taking into account the presence of censored information. The probability of working, evaluated as a function of geographical area, level of education, gender and reproductive choices before entering the labour market, suggests that individuals residing in the South and women with at least one child have a lower probability of getting a job.

Over the long term, individuals from high SES families, on average, enjoy higher wages (+11.8%) compared to those from low SES backgrounds, confirming the presence of returns of SES in the job market and also controlling for the differences between individuals at the entrance. This result provides evidence of the presence of a wage persistence gap among individuals who have attained the same level of education.

Regarding gender differences, men, on average, attain lower educational levels than women but have higher wages on entry (8.7%). Furthermore, this wage disparity between genders widens over time, reaching +32.4% in the long term.

With respect to the indirect effect of Eq. (1) predictors on Eq. (2) dependent variables and of Eqs. (1) and (2) predictors on Eq. (3) outcome variables, we focus on the analysis of the partial indirect effect of family of origin SES on short and long-term wages. Findings provide evidence that individuals whose families are located in the highest quartile of the SES Index benefit from a further increase of about 11% in the short term and 13% in the long term in the daily wage with respect to those coming from the 1st quartile of the distribution of family of origin SES. This result suggests that the indirect effect of coming from a wealthy family is the strongest observed in terms of magnitude and does not change significantly between entry and the following ten years.

In summary, our results demonstrate a significant effect of the family of origin, not only on the education of offspring, as widely documented in existing literature, but also on their labour market outcomes. The family can exert a notable influence on career paths, facilitating access to higher-paying jobs, as evidenced by the magnitude of the coefficient describing the impact of family background on wages. Over a ten-year period, individuals from families with higher socio-economic status typically earn higher wages on average, indicating the existence of a wage persistence gap among individuals who attain similar levels of education but originate from families with varying socio-economic statuses. The negative and significant sign of the correlation coefficient highlights that unobserved factors that make permanent participation more likely determine selection bias (they tend to be associated with lower wages) (see Table 3).

7. Discussion

In this study, we have investigated how the process of reproducing inequalities in the labour market operates in Italy, focusing on the influence of family background on individuals' educational achievements and subsequent career outcomes. Utilizing the AdSilc database, a comprehensive source of administrative and socio-economic data, we have employed innovative methodologies to analyse the complex interplay of exogenous, mediator, and endogenous variables.

We have explored the role of family socio-economic status by using the Generalised Path Analysis and incorporating the Heckman selection model to address potential biases in labour market participation. Our findings reveal significant intergenerational transmission of inequalities and a persistent wage gap across all cohorts studied. Specifically, our results demonstrate a strong effect of family background not only on offspring's education, as extensively documented in the literature [20,30], but also on their outcomes at the entrance in the labour market. This effect not only persists over time but is amplified after ten years, with wider disparities observed between men and women.

This long-term impact of family socio-economic status on labour market performance seems to confirm the compensatory advantage hypothesis [14]. Upper-class families can leverage their social and economic resources to either compensate for their children's lower performances or to secure advantages in cases of equal performance. This

Table 2
Generalized Heckman path model.

	Y EDUC		log W1			log W2			Z	
Covariates	**coef.**	**p-value**	**coef**	**% Change**	**p-value**	**coef**	**% Change**	**p-value**	**beta**	**p-value**
MACROAREA (center as ref.)										
North	-0.09	0.303	0.03	3.4	0.203	0.10	10.1	0.000	0.32	0.000
South & Islands	-0.45	0.000	-0.02	-2.3	0.492	-0.08	-7.3	0.007	-0.40	0.000
GENDER										
Male	-0.58	0.000	0.08	8.7	0.000	0.28	32.4	0.000	0.42	0.000
CHILDREN (YES)			-0.02	-1.6	0.514	0.02	1.7	0.357	0.34	0.000
CHILDREN#Male									0.28	**0.007**
COHORT (1962-1966)										
1967-71	0.31	0.003	-0.01	-1.2	0.647	0.01	0.7	0.765		
1972-76	0.64	0.000	-0.07	-7.1	0.010	-0.01	-0.7	0.777		
1977-81	0.78	0.000	-0.14	-13.2	0.000	-0.02	-2.1	0.423		
SES (Low)										
Medium low	0.81	0.000	0.00	-0.2	0.943	-0.01	-0.9	0.694		
Medium high	1.58	0.000	0.03	2.6	0.344	0.04	3.7	0.105		
High	3.54	0.000	0.01	0.8	0.805	0.11	11.8	0.000		
Y Educ			0.03	3.0	0.000	0.03	3.4	0.000	0.060	0.000
LATENT (L)			-0.54	-41.6	0.000				1	
Control variables										
Year at entrance in the LM			x	x	x					
log W1						x		x		
Cumulative experience						x		x		
Intercept	x	x	x		x	x		x		
var(ISCED_e1)	**7.92**	0.119								
var(W1_e2)	**0.33**	0.020								
var(W2_e3)	**0.33**	0.020								
rho (e2,e4)	**-0.59**									

Table 3
Indirect effect of family SES on short (W_1) and long terms (W_2) wages trough education.

Covariates	log W_1 β	% Change	p-value β	log W_2	% Change	p-value
SES (ref.Q1)						
Q2	0.02	2.48	0.00	0.027	2.77	0.000
Q3	0.05	4.87	0.00	0.053	5.45	0.000
Q4	0.11	11.28	0.00	0.119	12.67	0.000

is evident from the magnitude of the coefficient reflecting the impact of family background on wages, supported by longitudinal data spanning a ten-year period. The findings indicate that, other things being equal, individuals from families with higher socio-economic status tend to earn higher wages on average. This underscores the presence of a wage persistence gap, highlighting disparities in earnings among individuals with similar educational levels but differing family socio-economic backgrounds [12].

Our results suggest that the Italian educational system is not fully capable of providing equal educational opportunities for all. Even those who achieve higher educational levels than their parents face lower chances of attaining higher socio-economic positions and wages compared to individuals from upper-class families. These findings raise critical questions about the labour market's ability to select the best workers and enable access to more demanding and remunerative professions for both men and women. Furthermore, the labour market's inability to recruit the best human resources for each job results in a loss of competitiveness for the country, which Italy cannot afford. All these results underscore the need for strategic investments in the educational system, particularly in marginalized areas such as Southern Italy and peripheral regions. The Scandinavian experience has shown that better results in equalizing opportunities are achieved in systems where early schooling and education policies are fully integrated along socio-economic lines [14]. It has now become imperative for Italy to invest in higher quality and full-time education in marginalized areas, as mandated by the Next Generation EU. Policies promoting easy access to high-quality childcare and a comprehensive, integrated schooling system can help reduce skill gaps from early childhood [31]. Additionally, removing entry barriers and costs that prevent highly educated individuals from accessing prestigious labour market positions is crucial. Policies aimed at improving the living conditions of the middle class and better rewarding skills in the labour market can enhance intergenerational social mobility [31]. Finally, ensuring equal opportunities for women in the labour market by removing obstacles to work-life balance, guaranteeing full-time schools, and promoting a culture of gender equality in all contexts is essential. Failing to facilitate social mobility results in the loss of valuable human resources and undermines the country's economic competitiveness.

CRediT authorship contribution statement

Elena Fabrizi: Writing – review & editing, Writing – original draft, Software, Methodology, Data curation. **Isabella Sulis:** Writing – review & editing, Writing – original draft, Methodology. **Annalisa Busetta:** Writing – review & editing, Writing – original draft, Methodology. **Giancarlo Ragozini:** Writing – review & editing, Writing – original draft, Methodology.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

References

[1] Savoia F. Income inequality convergence among EU regions. Socio-Econ Plan Sci 2024;92(2024):101803.
[2] OECD. Divided we stand: why inequality keeps rising. Paris: OECD Publishing; 2011.
[3] Causa O, Johansson Å. Intergenerational social mobility in OECD countries. OECD J: Econ Stud 2011;1–44.
[4] Christofides LN, Polycarpou A, Vrachimis K. Gender wage gaps, 'sticky floors' and 'glass ceilings' in Europe. Labour Econ 2013;21:86–102.
[5] OECD education at a glance 2012. In: Education at a glance 2012: OECD indicators. Paris: OECD Publishing; 2012.

[6] Causa O, Chapuis C. Equity in student achievement across OECD countries: an investigation of the role of policies. OECD Economics Department Working Papers, (708), Paris: OECD Publishing; 2009.
[7] Raitano M, Vona F. From the cradle to the grave: The influence of family background on the career path of Italian Men. Oxf Bull Econ Stat 2018;80(6):1062–88.
[8] Raitano M, Vona F. Measuring the link between intergenerational occupational mobility and earnings: evidence from eight European countries. J Econ Inequal 2015;13:83–102.
[9] Cholli NA, Durlauf SN. Intergenerational mobility. NBER WORKING PAPER SERIES, Working Paper 29760, 2022.
[10] Bernardi F, Ballarino G. Education, occupation and social origin: a comparative analysis of the transmission of socio-economic inequalities. Cheltenham: Edward Elgar Publishing; 2016.
[11] OECD broken social elevator?: how to promote social mobility. Organization for Economic; 2018.
[12] Benedetti I, Crescenzi F. The role of income poverty and inequality indicators at regional level: An evaluation for Italy and Germany. Socio-Econ Plan Sci 2023;87:101540.
[13] Fabrizi E, Rocca A. NEET status duration and socio-economic background. Socio-Econ Plan Sci 2024;95:101986. http://dx.doi.org/10.1016/j.seps.2024.101986, https://www.sciencedirect.com/science/article/pii/S003801212400185X.
[14] Holtmann AC, Bernardi F. The equalizing effect of schools and its limits. In: Research handbook on the sociology of education. Edward Elgar Publishing; 2019, p. 253–67.
[15] Busetta A, Fabrizi E, Sulis I, Ragozini G. Mobilità sociale delle famiglie. In: Rapporto sulla popolazione. le famiglie in Italia. forme, ostacoli, sfide, Il Mulino, Milano. 2023, p. 207–34.
[16] Istat la struttura delle retribuzioni in Italia - anno 2018 - statistiche report. 2021, https://www.istat.it/it/files/2021/03/REPORT_STRUTTURA_RETRIBUZIONI_2018.pdf.
[17] Kogan I, Noelke C, Gebel M. Making the transition: education and labor market entry in central and Eastern Europe. Stanford, CA: Stanford University Press; 2011.
[18] Blossfeld HP. Persistent inequality: changing educational attainment in thirteen countries. Westview Press; 1993.
[19] Shavit Y, Moller W. From school to work: a comparative study of educational qualifications and occupational destinations. Oxford University Press; 1997.
[20] Goldthorpe JH. The role of education in intergenerational social mobility: Problems from empirical research in sociology and some theoretical pointers from economics. Ration Soc 2014;26(3):265–89.
[21] Hornstra M, Maas I. Does the impact of the family increase or decrease over the life course? Sibling similarities in occupational status across different career points. Res Soc Stratif Mobil 2021;75.
[22] Samejima F. Psychometrika monograph (17). Psychom Soc 1969.
[23] Busetta A, Fabrizi E, Sulis I, Ragozini G. Does family of origin make a difference in occupational outcomes? In: Book of short papers SIS 2022-51th scientific meeting of the Italian statistical society, Pearson, Milano. 2022, p. 134–43.
[24] Heckman JJ. The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. Ann Econ Soc Meas 1976;5:475–92.
[25] StataCorp structurial equation modeling reference manual release 18. Texas: College Station; 2023.
[26] Acock AC. Discovering structural equation modeling using stata. Texas: Stata Press Books; 2013.
[27] Kline RB. Principles and practice of structural equation modeling. New York: Guilford publications; 2015.
[28] Rabe-Hesketh S, Skrondal A, Pickles A. Generalized multilevel structural equation modeling. Psychometrika 2004;69:167–90.
[29] Puhani P. The heckman correction for sample selection and its critique. J Econ Surv 2000;14:53–68. http://dx.doi.org/10.1111/1467-6419.00104.
[30] Fiel JE. Great equalizer or great selector? Reconsidering education as a moderator of intergenerational transmissions. Sociol Educ 2020;93(4):353–71.
[31] Nybom M. Intergenerational mobility: a dream deferred. ILO Future of Work research paper series (7), 2018.

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