



Being resilient to close the gap: Is it enough?

Iván Vicente^{a,*}, José M. Pastor^b, Ángel Soler^b

^a Universitat de València, Spain

^b Universitat de València and Instituto Valenciano de Investigaciones Económicas (Ivie), Spain

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ABSTRACT

Several studies in the literature have used the concept of educational resilience as a proxy variable to analyze the equality of opportunity in education. Nevertheless, it remains unclear whether this educational resilience is enough for them to earn the same wages as individuals from advantaged socioeconomic backgrounds. For this reason, the present study takes a pioneering approach to examine the effects of educational resilience on hourly wages. The research uses multilevel hybrid models with data taken from the EU-SILC database for the EU-28 countries. Results show that resilient, on average, cannot achieve the same hourly wage as more advantaged individuals.

1. Introduction

The term resilience refers to the resistance or capacity to overcome adversities in difficult contexts or situations. This virtue can be attributed to countries, companies and students, among others. In economics of education resilient students are considered as those who, given their family backgrounds and disadvantaged socioeconomic origins, manage to overcome adversities and achieve a higher level of education than would otherwise have been expected in their socioeconomic circumstances. From a social point of view, the goal would be to achieve a high percentage of resilient students, as this reflects that its education system ensures more equality of opportunities for students, its inclusiveness and its proper performance.

The concept of resilience in education has been defined previously in the literature (Agasisti & Longobardi, 2014, 2017; Agasisti et al., 2017; Borman & Overman, 2004; Cordero & Mateos-Romero, 2021; Rouse, 2001; OECD, 2011, 2018b; Vicente et al., 2021; Wills & Hofmeyr, 2019) and has been used to analyze equality of opportunities in the educational context, frequently based on the PISA survey (Programme for International Student Assessment) conducted by the OECD. Basically, students were classified as resilient if, given their relatively disadvantaged socioeconomic background, they have obtained better educational performance than expected. Thus, the present study provides an extension of this literature, but for the first time, during adulthood, offering a novel approach to resilience by examining the level of education attained. Then, we provide a pioneering analysis about how would be the future, in terms of hourly wages, of those students who were resilient inside the education system, comparing them with the non-resilient ones.

Numerous studies have shown that good educational achievement increases the probability of future economic success (Allmen-dinger & Leibfried, 2003; Bloom et al., 2007; Hout, 2012; Pastor & Peralta, 2010). However, although educational resilience implies relative educational success, the literature has not analyzed whether being educational resilient brings advantages in their adult life and, consequently, contributes to eliminate, totally or partially, their economic disadvantages (i.e., lower wages) with respect to individuals with advantaged socioeconomic backgrounds. This is especially relevant because if being resilient cannot, at least, reduce

* Corresponding author at: Faculty of Economics, Avda. Dels Tarongers s/n., València, 46022, Spain
E-mail address: ivan.vicente@uv.es (I. Vicente).

wage differences with the most socioeconomically advantaged individuals, education could not be a useful tool to reduce inequalities in our societies.

Therefore, the main hypothesis (Hypothesis 1) tested in this study is that resilient individuals, because of their efforts to overcome adversities related to their initial socioeconomic background seen in a series of soft skills, achieve similar wage levels as those who start from an advantaged socioeconomic background, despite the fewer difficulties this latter group face. In other words, does being resilient in the educational stage mean that the possible economic differences between the advantaged and the disadvantaged in terms of wages are overcome in adulthood, and with them, differences in living conditions? Does simply coming from a disadvantaged background have a negative effect, despite having become resilient?

This is an important question for the education system and social mobility, since if, despite the public and private effort involved in being resilient, the differences in living conditions between socioeconomic disadvantaged and advantaged are not reduced or eliminated, education is deficient in its task of driving the upward social elevator. The answer to this question is hugely important, not only to validate the role of education as a social elevator that guarantees equality of opportunities for all individuals, but also to guide public policies.

Our second hypothesis (Hypothesis 2) tests whether the expected positive wage difference favoring resilient individuals over disadvantaged but non-resilient individuals can be explained exclusively by achieved educational level, and not by other unobservable variables related to resilience. Given their similar socioeconomic backgrounds, the resilient individuals have successfully overcome their adversities during their years in education by demonstrating abilities related to soft skills that those who do not become resilient do not display. By definition, the resilient individuals have a better education, which suggests they should enjoy higher wages, but are there any differences, other than education, between these two types of individuals that can be explained by resilience? Are these unobservable features, that make some disadvantaged individuals resilient, relevant to explain the wage differences between resilient and non-resilient disadvantaged individuals?

In summary, the two hypothesis to be tested are as follows:

- Hypothesis 1: being educationally resilient allows individuals to overcome the negative effects of their socioeconomic status of origin in their adulthood.
- Hypothesis 2: the expected positive wage difference favoring resilient individuals over disadvantaged but non-resilient disadvantaged cannot be explained exclusively by achieved educational level.

To contrast both hypothesis, we need information on the individuals' whole life cycles, that is, from their initial socioeconomic background in adolescence and their educational achievement, to the wages they earn in adulthood. Then, to analyze the whole life cycle from individuals' years in education through to adulthood, in this study we use the European Statistics of Income and Living Conditions (EU-SILC) database, which provides not only economic and educational information on the individuals surveyed in adulthood, but also information on their family background for the case of Europe between the years 2005 and 2019. This extensive statistical database, only available upon request to Eurostat, is unique in the European context. Due to its rich statistical content, an indicator of individuals' initial socioeconomic status can be constructed with which to examine the link between educational resilience and economic conditions in adulthood, which is an index similar to that used in PISA (the ESCS index).

The paper is structured as follows. After this introduction, the literature is reviewed in [Section 2](#); [Section 3](#) describes the data and the methodology used; the results are presented in [Section 4](#) with some public policy recommendations; finally, the main conclusions are reported in [Section 5](#).

2. Literature review

An individual's socioeconomic background can have a cross-cutting effect on their living conditions throughout the whole life cycle. Consequently, there is an extensive and above all varied range of approaches to this question in the literature, both in its methodology and its aims ([Pintelon et al., 2013](#)). However, the differences between individuals according to the economic capacity¹ of their parents or guardians have traditionally been studied through intergenerational mobility analysis and the social elevator.

The contexts in which socioeconomic patterns are repeated between generations reflect scant intergenerational social mobility. In these cases, the social elevator does not work effectively and has negative consequences for society as a whole ([OECD, 2018a](#)). The lack of intergenerational mobility is often explained using the term "sticky", meaning that individuals from lower social classes, sticky floor, and those from more advantaged social classes, sticky ceiling, are more likely to remain in the same social level in which they were born ([OECD, 2018a](#)), a phenomenon that affects the disadvantaged more negatively.²

The term "equality of opportunity", formalised for the first time in economics by [Roemer \(1998\)](#), referred to a broad equality of opportunity (income, wealth, etc.). This author distinguished between "circumstances", which are beyond the individual's control, and "efforts", which do depend on the individual. He used this distinction to argue that inequalities fall into two types: inequality in efforts and inequality in opportunities (originating in "circumstances"). This second type of inequality would explain why socioeconomically disadvantaged individuals had lower incomes, simply because of their status.

¹ Refers to the individuals' socioeconomic background, which is undoubtedly made up of various factors, not all of which are economic.

² Note that when intergenerational mobility is analysed through the lens of equal opportunities, what tends to be studied is relative intergenerational mobility, that is, taking into account relative, not absolute, changes between generations ([OECD, 2018a](#)).

Since the publication of Roemer (1998), many studies have analyzed equality of opportunities. Most of these studies examine the evolution and differences between countries in terms of equality of opportunities in the purely economic context, and few analyze the relationship between educational inequalities and their consequences for income inequalities (Checchi & van De Werfhorst, 2018; Solga, 2014). In a country with a high level of inequality, the income of a person from a disadvantaged socioeconomic background would be negatively affected in adulthood (Álvarez & Menéndez, 2021; Brzezinski, 2015; Marrero & Rodríguez, 2012).

In the case of Europe, some studies have found the highest levels of equality of opportunities in the Nordic countries (Marrero & Rodríguez, 2012; Álvarez & Menéndez, 2021; OECD, 2018a), whereas countries in eastern Europe and the Mediterranean occupy the worst positions (Marrero & Rodríguez, 2012; Álvarez & Menéndez, 2021). Note that in general terms, Europe is better placed than other world regions in terms of equality of opportunities, although it is not evolving in an especially positive direction (Alvaredo et al., 2017).

However, the present study differs from previous research in that it focuses on the least advantaged individuals and analyzes how the education system, through resilience, can intervene in their adult lives. The concept of resilience in the sense we use in this study has a diffuse origin, that could be partially attributed to psychology. The first educational studies of this century were based in the United States (Borman & Overman, 2004; Rouse, 2001) with different definitions of when a student can be considered resilient, using also different kinds of variables to discern that. In any case, both studies tried to find the resilience determinants at individual and also at school level.

The popularization of resilience in the field of economics of education started mainly with the OECD documents and the use of the PISA survey. In 2011, the OECD published a book entitled "Against the Odds: Disadvantaged Students Who Succeed in School" (OECD, 2011), which provided the first analyzes of resilient students in 55 countries with a similar objective to the previous studies: try to find the resiliency determinants. After this publication, a number of relevant papers on resilience as a methodology for measuring equality of opportunity began to emerge with a similar objectives as the previous ones (Agasisti & Longobardi, 2014, 2017; Agasisti et al., 2017; OECD, 2018b; Cordero & Mateos-Romero, 2021; Vicente et al., 2021; Wills & Hofmeyr, 2019). Moreover, this concept was used also for public policy recommendations in order to improve the equality of opportunities inside education system, mainly using the expenditure in education (Agasisti et al., 2017; Vicente et al., 2021). The results showed that the expenditure in education is only relevant in terms of resilience, i.e., equality, for economically disadvantaged countries (Agasisti et al., 2017; Vicente et al., 2021).

If there is no equality of opportunity inside education system, it is difficult to find real equality in more general terms since education is regarded as the main driver of the social elevator (OECD, 2018a; Ermisch & Francesconi, 2001). Indeed, if this is the case, not only will it fail to drive the social elevator, but it will become another source of inequality. This is because the educational level a person achieves does not depend wholly on them, but the "circumstances" Roemer referred to are also important (Palomino et al., 2019). If that were the case, the well-known "Matthew effect" would occur; that is, only advantaged students would achieve educational success and this would translate into better living conditions and wages in adulthood. Put another way, the education system would exacerbate the social differences rather than mitigate them, shifting away from the functionalist theory mentioned above.

Similarly, there is evidence to show that these "circumstances" not only affect the level of education achieved, but also which field of studies is chosen within a given educational level (Campbell et al., 2022) or the quality of educational institution attended (Chetty et al., 2017). Individuals from disadvantaged environments, even though they may have a similar academic level to others, are less likely to enrol on university degrees with higher entrance requirements and are also less likely to take degrees leading to jobs that are better paid for reasons that are not strictly economic (Campbell et al., 2022). At the same time, individuals from advantaged backgrounds are more likely to study throughout their lives (lifelong learning), whether in formal educational settings or otherwise (Pérez et al., 2012).

Growing up in a difficult environment can have consequences in adult life beyond the level or quality of education received and the level or amount of wage earned, although these factors are clearly related. Individuals from a disadvantaged social class also tend to have poorer employment prospects and are more likely to be unemployed (Lahtinen et al., 2020; McGinnity & Hillmert, 2004). Furthermore, the general consensus in the literature is that health inequality is related to income, in Europe as well as other regions (Hernández-Quevedo et al., 2010), as individuals with lower incomes are also those with the poorest health. This may also be related to a lack of rest, type of employment activity and occupation, and previous education (Hernández-Quevedo et al., 2010).

However, growing up in a disadvantaged environment and successfully overcoming adversities may be related to certain skills such as the capacity for effort or motivation; that is, soft skills may be important for educational resilience (Vicente et al., 2021) and could be associated with preschool education (Cordero & Mateos-Romero, 2021) where they can be developed more easily (Heckman, 2011).

Therefore, although education should be instrumental in reducing the inequalities an individual is born with, as we have seen above this is not always may even be the cause of further inequalities. In the present study we examine the differences between individuals from different backgrounds and with different academic achievements, and examine the validity of education as a social elevator through educational resilience.

3. Data and methods

The methodology we propose is novel and is based on constructing this socioeconomic background index to estimate expected educational level using a multilevel ordered probit model (pseudo-ESCS). Based on this result, resilient individuals are considered to be those who exceed their expected educational performance sufficiently given their socioeconomic background (see the methodology section for a more thorough definition). Educationally resilient individuals are defined with this methodology, a technique that is novel in two ways, not only in how it defines resilient individuals, but also because it links academic past with present wages.

Given that the necessary, but not sufficient, condition for an individual to be resilient is socioeconomic disadvantage, the sample is divided into four socioeconomic categories using the constructed index: resilient, non-resilient disadvantaged, advantaged, and other (neither disadvantaged nor advantaged); Fig. 1 shows these categories. Using all the useful available information, we apply three-level multilevel regressions known as multilevel hybrid models (Mijts, 2019; Schmidt-Catran, 2014; Schmidt-Catran & Fairbrother, 2015), in which time, waves and countries can be considered. These regressions can be used to compare, using dichotomous variables, the different types of individuals according to their socioeconomic background and their educational achievement.

Our goal is to analyze the effects of effects of educational resilience on wages life conditions in adulthood. We use the gross wage per hour in terms of purchasing power parity (PPP) as a proxy of the individual's life conditions in adulthood³. The results show that education does work as an upward social mobility elevator, but imperfectly. There is a positive gap that favours individuals coming from more advantaged family situations or contexts, which means that resilient individuals hit a glass ceiling because of certain circumstances and characteristics intrinsic to their socioeconomic status. Moreover, related to the second hypothesis, it seems that on its own, resilience does not lead to higher wages, and soft skills are overshadowed.

3.1. Data

The European Statistics of Income and Living Conditions (EU-SILC) database used in this study covers a large number of countries, including all European Union member states. The survey is carried out independently by each country's statistics institute, although it is coordinated and standardized by Eurostat. Access to the database is limited and is only granted after a formal request has been analyzed and approved by Eurostat. Given the objectives of the present study, three waves of the survey were used for most of the study (2005, 2011 and 2019) since these waves include the module "Intergenerational transmission of disadvantages", which provides information on a surveyed individual's situation in adolescence.

The EU-SILC was chosen as the database for this study because of the module mentioned above, which includes a survey with questions about the socioeconomic conditions of the household when the surveyed individual was approximately 14 years old. This complimentary data on family background of the surveyed population with information on wages makes this survey particularly appropriate for studying intergenerational mobility and inequality.

Although the EU-SILC survey does not provide precise information on the individual's family income, since information on income is limited to a subjective question,⁴ it does contain information about the parents' employment and education, from which an approximation can be made of the individual's initial socioeconomic background. To make this approximation, we follow a similar methodology to that used by the OECD in PISA (OECD, 2017), the point of departure for the present article. This methodology, known as principal component analysis, uses data on the parents' occupation (measured in ISCO-88 or ISCO-08) and education (highest level attained) to yield a single variable: the principal component. This variable is used to reproduce the Index of economic, social and cultural status or ESCS of PISA, that is, the initial socioeconomic context (socioeconomic status or SES), thus creating a pseudo-ESCS.

The construction of this pseudo-ESCS takes into account the sample weightings through a polychoric correlations matrix, which yields a principal component that explains most of the total variance (about 60% in the three waves), which according to the previous literature is well above the sufficient level (Howe et al., 2012; Vyas & Kumaranayake, 2006). This index allows us to define as initially socioeconomically disadvantaged those individuals who are below percentile 33 for their country (Vicente et al., 2021; Agasisti et al., 2017; OECD, 2011), although robustness tests were carried out successfully with percentiles 20 and 50 with the same results.

The aim of this study is to analyze the effects of educational resilience on wages received in adulthood.⁵ The approach is by individual rather than by household, so variability is not lost and the transmission from the individual's younger stage to adulthood remains true to that individual. Wage is measured in terms of gross PPP euros per hour,⁶ taking into account the number of hours⁷ and months worked (Schäfer & Gottschal, 2015).

Most of the explanatory variables are included as control variables since, as we will see below, the real interest in the analysis lies in the dummy variables incorporated in the regressions, referring to the individuals according to the socioeconomic environment, that split the sample in four categories: disadvantaged, resilient, advantaged⁸ and the rest.

Two types of control variables are used: those referring to the individual and those referring to the country. Individual controls are essentially sex, age (and potential decreasing returns), country of birth (the same as that of the survey, different but in the EU, or different but outside the EU), employment activity (one-digit NACE), civil status, full-time work or not, and type of occupation (high, medium and low, based on ISCO-88 and ISCO-08). Maximum educational level attained deserves separate mention as it has a key role in this study and takes four values from primary education to higher education (see Table 1 for more information).

³ Several control variables (sex, age, occupation, GDP per capita, etc.) are used in the sample with particular importance given to educational level achieved.

⁴ Because of these limitations in most databases, TSTSLS (two-sample two-stage least squares) methodology is needed for studies similar to this one (Cervini-Plá, 2015; Ermisch & Nicoletti, 2008), although it is not free of criticism (Jerrim et al., 2016).

⁵ Only individuals between the ages of 35 and 50 years old are considered, thereby avoiding irrelevant or extreme results.

⁶ In this way we mitigate the possible biases entailed in the individualist approach, particularly in the case of women and the selection problem (Cervini-Plá, 2015).

⁷ Weekly hours were multiplied by 4.2 (average number of weeks per month) to obtain monthly hours (Schäfer & Gottschal, 2015).

⁸ Advantaged individuals are those above percentile 66 of the variable measuring socioeconomic background (pseudo-ESCS) for their country of origin.

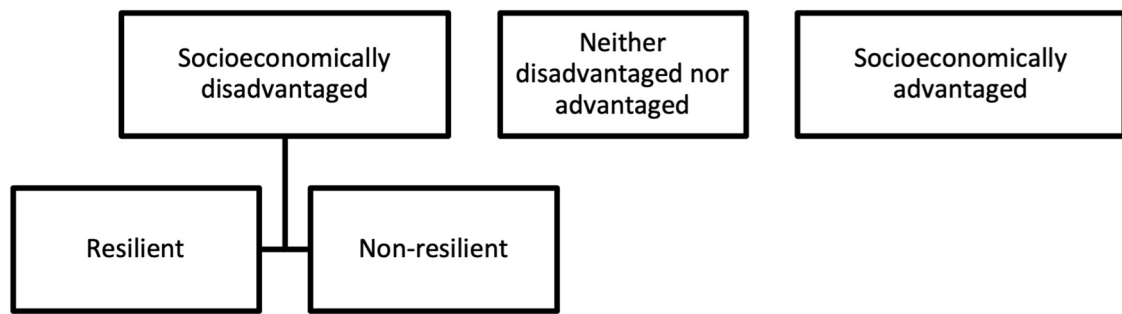


Fig. 1. Sample classification. Source: own elaboration.

The country control variables are macroeconomic variables that take into account variations in economic development among countries and their economic cycles, namely GDP per capita and level of inequality measured by the Gini index (based on equivalent disposable income). Both variables are from Eurostat.

The final sample on which the main results are based is shown in Table 1, which displays the distribution of the variables. The total sample, taking into account sample weightings, represents around 110 million individuals. It is also equally balanced in terms of sex, and the majority of the individuals were born in the survey country, are married and reached secondary education.

3.2. Methods

We used the constructed socioeconomic background variable (pseudo-ESCS) to identify individuals considered to be socioeconomically disadvantaged. However, to be educationally resilient they must have achieved a higher level of education than expected, considering their disadvantaged socioeconomic background. Therefore, our definition of resilience relies on two key variables: the socioeconomic background of origin and the level of education attained. This approach to defining resilience, although conceptually similar to previous work (Agasisti & Longobardi, 2014, 2017; Agasisti et al., 2017; OCDE, 2011; OECD, 2018b; Wills & Hofmeyer, 2019), is technically superior, since resilient individuals are identified in a novel way with a more complex methodological technique that, unlike previous studies, takes into account different environmental effects by country with an ordered categorical dependent variable (Vicente et al., 2021). The main advantage of this technique is that it does not assume homogeneity across countries of the environmental effect on achieved educational level and allows their effects to be isolated.

Thus, unlike previous studies that have used PISA scores, in this study we use a multilevel ordered probit in which the only explanatory variable is socioeconomic background (X_{ij}), the pseudo-ESCS index, and where the dependent variable is the educational level achieved, which takes four values (Table 1).

Eq. (1) expresses the model considered, which is applied to the three waves of the module “Intergenerational transmission of disadvantages”. This equation represents the multilevel ordered probit in terms of latent response (y_{ij}^*). As can be seen from the equation, this is a multilevel model with a second-level random intercept (δ_{0j}) and random slope (δ_{1j})⁹:

$$y_{ij}^* = \gamma_{01}X_{ij} + \delta_{0j} + \delta_{1j}X_{ij} + u_{ij} \quad (1)$$

Where i = individual and j = country

We calculated the expected value given the estimated probabilities¹⁰ for each individual by considering the estimated probability for each educational level ($\hat{y}_{ij}$) (Salvador et al., 2014) and by taking the difference from the actual educational level achieved weighted by the expected value ($[y_{ij} - \hat{y}_{ij}]/\hat{y}_{ij}$). Given this percentage of educational surprise or disappointment, resilient individuals are those who, as well as coming from disadvantaged socioeconomic backgrounds, are above percentile 66 of those who achieved a higher educational level than expected ($[y_{ij} - \hat{y}_{ij}]/\hat{y}_{ij} > 0$); when robustness tests were carried out with percentiles 50 and 75, the main results held.

To analyze differences in wages between individuals according to their initial socioeconomic background, we used multilevel hybrid regressions at three levels (Eq. (2)), since this technique allows us to use all the waves in the same regression, thereby maximising the number of observations while taking advantage of the information from the wave and the country each individual belongs to.¹¹ The dependent variable is gross wage per hour worked (w_{ijk}) with the dichotomous variables that classify the sample according to the pseudo-ESCS, education and the other control variables as first-level explanatory variables (X_{ijk}), as well as those referring to higher

⁹ In calculating the model, we used sample weightings rescaled following expert advice (Carle, 2009; Rabe-Hesketh & Skrondal, 2006); specifically, we use the method that equates the apparent size of the group to the real size, although the debate on how to rescale weightings remains open.

¹⁰ Clearing the differential effect of socioeconomic background by country in order to make it the same across individuals from the different countries.

¹¹ The analysis is restricted to those who are not self-employed to ensure proper standards of reliability. Weights were rescaled as in Eq. (1).

Table 1
Descriptive structure of the sample.

		Sample	
		N. observations	Percentage
Gender	Male	55,054	50.6
	Female	59,050	49.4
	Total	114,104	100.0
Country of birth	Same as residence	104,726	90.9
	Any EU25 country	4061	2.5
	Any other country	5317	6.6
	Total	114,104	100.0
Economic activity sector	Artistic and other activities	4703	4.3
	Financial and insurance activities	4017	3.9
	Professional and administrative activities	7936	7.7
	Health and social services activities	11,509	11.0
	Public administration and defence	11,959	10.8
	Trade and repair	14,223	12.4
	Agriculture	2835	1.9
	Construction	7158	6.0
	Education	11,823	9.4
	Hospitality	3764	3.0
	Manufacturing and others	24,682	21.1
	Transport, storage and communication	9494	8.7
	Total	114,103	100.0
Occupational level	Low	27,079	21.1
	Medium	38,013	33.0
	High	46,855	45.9
	Total	111,947	100.0
Marital status	Married	35,596	34.3
	Not married	78,539	65.7
	Total	114,135	100.0
Level of education	Primary education	6404	3.0
	Lower secondary education	13,474	9.6
	Upper secondary education	56,337	50.9
	Tertiary education	37,920	36.5
	Total	114,135	100.0
Full-time employment	No full-time employment	13,991	16.6
	Individuals working full-time	100,671	83.4
	Total	114,662	100
Age	Mean age	42.4	
Gross hourly wage	Median hourly wage	11	

Note: Percentages, means and medians obtained using the sample weights. Source: EU-SILC (Eurostat) and own elaboration.

levels (Z_{jk} and $\bar{Z}_k$). This type of multilevel regression is one of the best options for working with surveys such as this one, although it is not widely used (Mijts, 2019; Schmidt-Catran, 2014; Schmidt-Catran & Fairbrother, 2015).

$$w_{ijk} = \beta_0 + \beta_1 X_{ijk} + \gamma_{within} (Z_{jk} - \bar{Z}_k) + \gamma_{between} \bar{Z}_k + \delta_k + \varepsilon_{jk} + u_{ijk} \quad (2)$$

Where i = individual, j = country-wave and k =country

As can be seen in Eq. (2),¹² the individuals (i) from the three waves are grouped into two levels. Individuals from the same country and wave are grouped in the second level (j) while individuals from all the waves from the same country are grouped in the third level (k). The individual or first-level variables are represented by (X), and the country-level variables are represented by (Z). However, the second-level variables or j represent fluctuations in each wave from the country average ($Z_{jk} - \bar{Z}_k$) while the third-level variables or k are the average for the period $\bar{Z}_k$ for each country.¹³

Therefore, after classifying the sample according to economic background and resilience, we now study the effect that being resilient has on wage per hour with models similar to Eq. (2). The dichotomous variables that classify the sample into four categories

¹² A dummy variable is added per year to control for time effects (fixed effects).

¹³ Therefore, the variables finally used in the regression of the country level are the differences from the average in each wave of GDP per capita data and the Gini index in level two and the average for the period of these variables in level three.

and the control variables allow us to make the pertinent comparisons, taking full advantage of the available information thanks to the multilevel hybrid models.

4. Results and recommendations

Education systems should guarantee that students can achieve successful educational results regardless of their family's socioeconomic background. In other words, according to Roemer (1998), the factor that determines students' educational success should be their "efforts" and not their "circumstances". This means that there will be resilient students who successfully overcome the disadvantages of their socioeconomic background and who obtain good educational outcomes that allow them to enjoy better wages as adults, thereby reducing or eliminating the effects of their initial socioeconomic background.

In this section we first identify the resilient individuals and the patterns and characteristics that differentiate them, including wage per hour, before testing our proposed hypotheses.¹⁴

4.1. Identifying resilient individuals

Fig. 2 presents the distribution of the percentage of educational surprise ($[y_{ij} - \hat{y}_{ij}] / \hat{y}_{ij} > 0$) or disappointment ($[y_{ij} - \hat{y}_{ij}] / \hat{y}_{ij} < 0$) for both the total sample and for the resilient individuals only. The figure shows that the models used to define resilient individuals are relatively accurate, since the distribution of the total sample is concentrated close to surprise level 0, suggesting that the model predicts educational level accurately because the number of surprises and disappointments is small.

The distribution of resilient individuals is exceptional because of the way they are defined. As Fig. 2 shows, most of these individuals are concentrated between surprise levels of 25 and 50%, although some of them surprise outside these percentages. Recall that to be classified as resilient, individuals must have grown up in a relatively disadvantaged socioeconomic environment, and that an expected educational level is calculated according to that background. Therefore, the lower the socioeconomic background index, the lower the expected educational level, given the positive correlation between the two. Notice that not being resilient, given the relatively low socioeconomic background, does not imply failure.

Fig. 3 displays the relationship between the socioeconomic background index and the percentage of educational surprise or disappointment. This figure comprises a cloud of dots that is clearly divided according to achieved educational level and that, in addition, differentiates between resilient and non-resilient individuals. For a given educational level, we can see that the percentage of surprise or disappointment varies according to the individual's socioeconomic background. This implies that, for example, achieving the maximum educational level will be a surprise close to zero for the most advantaged individuals, but a surprise of over 50% for those with a lower pseudo-ESCS index, clearly showing the difficulties associated with an initial disadvantaged socioeconomic background.

Therefore, Fig. 3 allows us to identify the surveyed individuals who were resilient during their years of education, by reaching an educational level sufficiently higher than that expected. The majority of these individuals are found in the first quadrant, although not all the individuals in that quadrant are resilient. This is because the definition of disadvantaged is relative to country of origin. Not all the individuals in this quadrant are disadvantaged, nor are all the disadvantaged individuals in that quadrant resilient.

Individuals denoted by the color orange in Fig. 3 are those who meet the two conditions to be classified as resilient and are those who represent the disadvantaged population who have successfully overcome adversities. The higher the number of this type of individual, the greater the equality of opportunity in the education system.

Table 2 presents the distribution of resilient individuals, disadvantaged non-resilient individuals, and advantaged individuals in the control variables used for the multilevel hybrid regression in the next section, as well as their distribution throughout the sample and the average wage per hour for each type of individual. The first notable difference is the employment sector of resilient individuals: they are highly represented in sectors related to health, public administration and education. In these three sectors the proportion of resilient individuals is clearly higher than the disadvantaged individuals, probably related to the educational level achieved, and also higher than the advantaged individuals, for whom we can infer a different pattern in their choice of employment sector, although they are less educated too.

In type of occupation, it is noteworthy that a higher proportion of the resilient individuals carry out tasks in the upper levels of the classification, even above the advantaged individuals. This must be related to the lower proportion of individuals with higher education among the latter group than the former. However, although resilient individuals have a higher level of education than advantaged individuals, proportionally, this is not transferred to types of employment: there is a 36 percentage point difference in the proportion of individuals with the highest educational level in the two groups in favour of the resilient individuals, while this difference in terms of high occupational levels is around 6%. These results seem to indicate a different pattern not only in sector of activity, but also in type of occupation, where the effect of education may be limited due to the intrinsic socioeconomic characteristics of the advantaged individuals.

Bearing in mind the differential patterns between different types of individuals, it was to be expected that those starting out from a disadvantaged socioeconomic background, but who exceeded expectations and became resilient, would obtain higher wages per hour in adulthood than those from disadvantaged backgrounds who did not (Table 1). Yet, once the education effect is removed, higher

¹⁴ Note that the results shown in this section are robust to the definition of disadvantaged to 20 and 50% of the environmental variable defined by the authors and the definition of resilience with surprise levels of 50 and 75%.

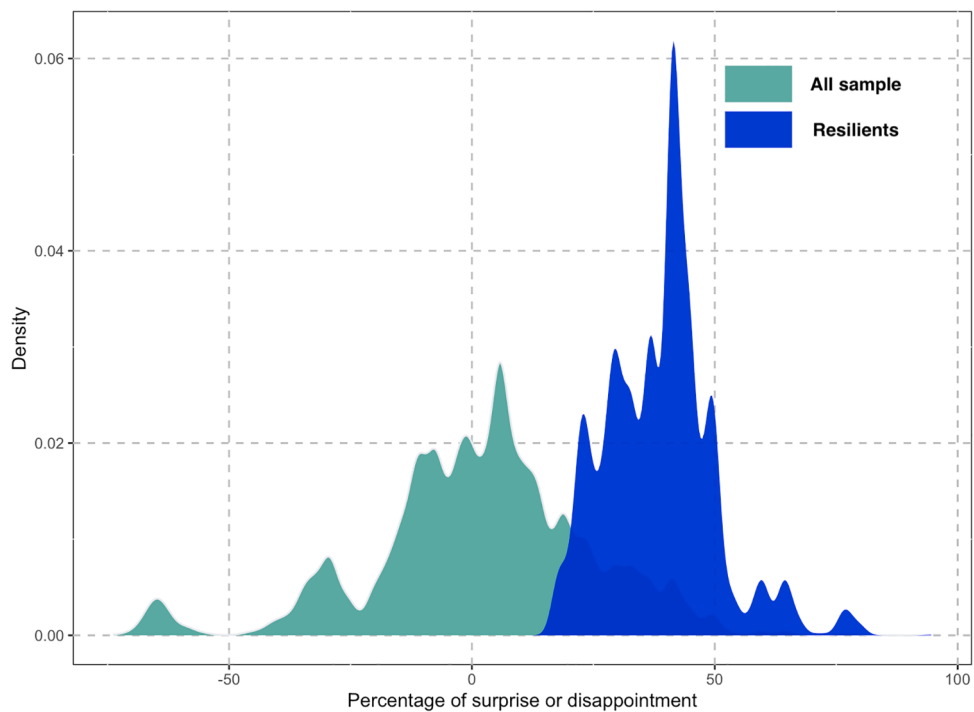


Fig. 2. Distribution of the percentage of educational surprise or disappointment for the total sample and resilient individuals.

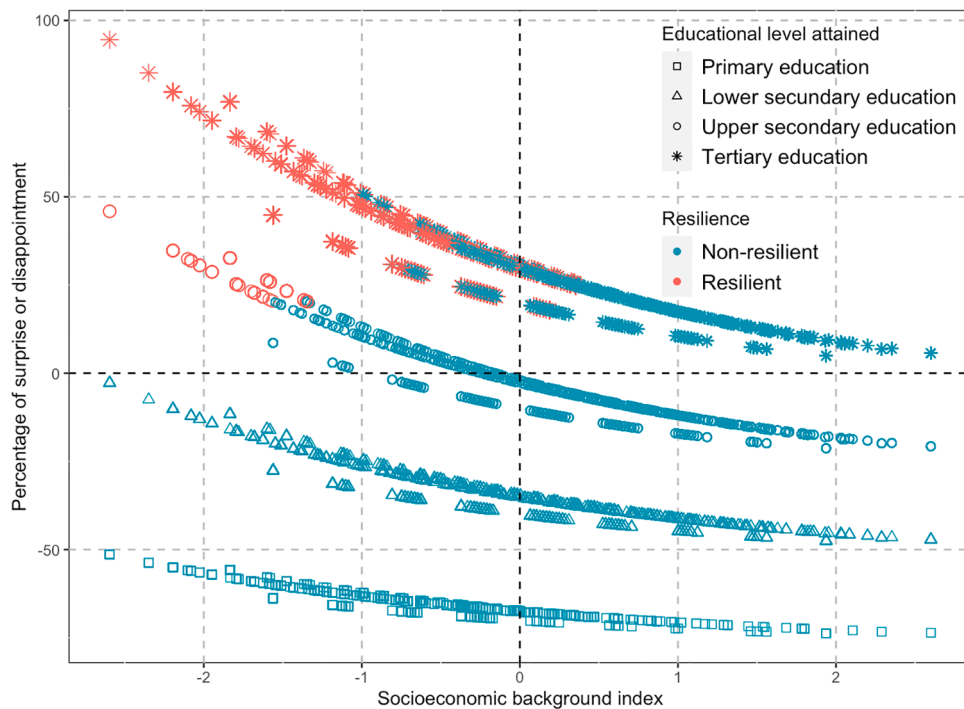


Fig. 3. Relationship between the percentage of educational surprise or disappointment and the socioeconomic environment of origin. (Source: EU-SILC (Eurostat) and own elaboration.)

wages could be expected for resilient individuals because of all the personal variables that cannot be controlled (Hypothesis 2).

However, we know less about the difference between resilient individuals and socioeconomically advantaged individuals. Given the educational level attained and the soft skills the resilient individuals showed in their education, it could be expected that there will

Table 2

Comparison between resilient, disadvantaged non-resilient and favoured individuals. Frequencies in percentages and means.

		Disadvantaged		
		Resilient	Non-resilient	Advantaged
Classification distribution	Over all sample	8.5	27.6	35.2
Gender	Male	46.8	53.0	49.9
	Female	53.2	47.0	50.1
Country of birth	Same as residence	90.4	89.4	89.8
	Any EU25 country	1.8	2.7	3.0
	Any other country	7.8	7.9	7.2
Economic activity sector	Artistic and other activities	3.4	4.6	4.3
	Financial and insurance activities	4.5	2.0	5.2
	Professional and administrative activities	7.8	6.0	9.2
	Health and social services activities	15.0	9.2	11.4
	Public administration and defence	13.9	8.3	11.8
	Trade and repair	0.8	3.2	1.1
	Agriculture	8.4	15.4	10.3
	Construction	4.3	8.3	4.4
	Education	16.8	3.7	12.8
	Hospitality	1.3	4.5	2.4
	Manufacturing and others	16.0	26.5	17.9
	Transport, storage and communication	7.7	8.4	9.2
Occupational level	Low	11.6	33.6	13.5
	Medium	19.8	46.3	23.7
	High	68.6	20.0	62.8
Marital status	Married	34.5	31.1	36.3
	Not married	65.5	68.9	63.7
Level of education	Primary education	0.0	7.0	1.0
	Lower secondary education	0.0	21.5	4.1
	Upper secondary education	8.4	71.5	39.5
	Tertiary education	91.6	0.0	55.4
Full-time employment	Individuals working full-time	84.6	81.8	85.0
Age	Mean age	42.6	43.3	41.7
Gross hourly wage	Median hourly wage	15.0	9.2	12.3

Source: EU-SILC (Eurostat) and own elaboration.

be no differences between these two types after controlling for, mainly, education (Hypothesis 1), but at the same time the advantaged individuals have other kinds of resources.

4.2. Resilience and hourly wage

Wage received is one of the variables that has the greatest effect on individuals' quality of life as it is associated with aspects such as enhanced enjoyment of leisure and better health. To analyze the effects of individuals' resilience on wages received in adulthood, we use multilevel hybrid models at three levels, described in the methodology section, that control both for wave and for country. These regressions, presented in Table 3, are the result of combining the three EU-SILC waves with information on initial socioeconomic background (2005, 2011 and 2019), where the dependent variable is the logarithm of the wage per hour.¹⁵

Table 3 presents eight models; the first four compare resilient and non-resilient disadvantaged individuals, while the second four compare resilient and socioeconomically advantaged individuals. Both comparisons follow the same structure: first the model is applied controlling for all the control variables except those related to occupation, activity and education; these latter variables are then added as controls in the following models. This is done because our aim is to isolate the pure effect of being resilient, but being resilient could have an effect on the kind of job they have, for example. Some models only differentiate by the base or reference category of the individual's socioeconomic status, such as model 1 and model 4, model 2 and model 5, etc.

Model 1 of Table 3 shows the average effect on wages of being resilient compared to that for non-resilient socioeconomically disadvantaged individuals, the reference category in this case. As can be seen, there is a significant difference between the two in favour of resilient individuals, which remains significant when level of occupation and sector of activity are controlled for (model 2), although the difference is substantially lower. Only when educational level is controlled for, as in models 3 and 4, does the significance of the dichotomous variable that identifies resilient individuals disappear.

Model 4 of Table 3 makes the same comparison, but this time all the control variables are added, including education. Keep in mind that in this model we controlled for both the direct effects of education, that is, educational level, and indirect effects related to sector of activity and occupational level, among others. Therefore, all the observable variables have been controlled for in this model and if there is any difference, it will derive from unobservable variables related to resilience.

From model 4, we can conclude that there are no differences in wage, on average terms, between disadvantaged individuals who

¹⁵ All the models presented in this subsection are log-lin models, as in most previous research on determinants of wages.

Table 3

Multilevel hybrid regressions for comparison in hourly wage. EU-SILC (2005, 2011, 2019).

Individual-level variables	Resilient vs non-resilient disadvantaged								Resilient vs socioeconomically advantaged							
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Resilient	0.300 ***	0.03	0.122 ***	0.02	−0.010	0.01	−0.019	0.01	0.024	0.02	0.004	0.01	−0.086 ***	0.02	−0.056 ***	0.01
Socioeconomically advantaged	0.276 ***	0.03	0.118 ***	0.01	0.076 ***	0.01	0.037 **	0.01	Base category		Base category		Base category		Base category	
Non-resilient disadvantaged	Base category		Base category		Base category		Base category		−0.276 ***	0.03	−0.118 ***	0.01	−0.076 ***	0.01	−0.037	0.01
Socioeconomically non-classified	0.136 ***	0.02	0.059 ***	0.01	0.025 ***	0.01	0.011	0.01	−0.140 ***	0.01	−0.059 ***	0.01	−0.051 ***	0.01	−0.026	0.01
Gender (Female=1)	−0.111 ***	0.01	−0.118 ***	0.01	−0.138 ***	0.01	−0.125 ***	0.01	−0.111 ***	0.01	−0.118 ***	0.01	−0.138 ***	0.01	−0.125 ***	0.01
Age	0.033 ***	0.01	0.033 ***	0.01	0.035 ***	0.01	0.034 ***	0.01	0.033 ***	0.01	0.033 ***	0.01	0.035 ***	0.01	0.034 ***	0.01
Age (square)	0.000 ***	0.00	0.000 **	0.00	0.000 ***	0.00	0.000 **	0.00	0.000 ***	0.00	0.000 **	0.00	0.000 ***	0.00	0.000 **	0.00
Country of birth (Same as residence =0)																
Any EU25 country (=1)	−0.161 ***	0.03	−0.108 ***	0.02	−0.161 ***	0.03	−0.117 ***	0.02	−0.161 ***	0.03	−0.108 ***	0.02	−0.161 ***	0.03	−0.117 ***	0.02
Any other country (=2)	−0.203 ***	0.04	−0.125 ***	0.03	−0.185 ***	0.04	−0.128 ***	0.03	−0.203 ***	0.04	−0.125 ***	0.03	−0.185 ***	0.04	−0.128 ***	0.03
Marital status (Married=1)	0.060 ***	0.01	0.042 ***	0.01	0.051 ***	0.01	0.040 ***	0.01	0.060 ***	0.01	0.042 ***	0.01	0.051 ***	0.01	0.040 ***	0.01
Full time employment	0.131 ***	0.02	0.061 ***	0.02	0.098 ***	0.02	0.053 **	0.02	0.131 ***	0.02	0.061 ***	0.02	0.098 ***	0.02	0.053 **	0.02
Occupational level (Low=0)																
Medium			0.076 ***	0.01			0.060 **	0.01			0.076 ***	0.01			0.060 **	0.01
High			0.348 ***	0.03			0.268 ***	0.02			0.348 ***	0.03			0.268 ***	0.02
Economic activity sector (Agriculture=0)																
Artistic and other			0.109 ***	0.04			0.097 ***	0.04			0.109 ***	0.04			0.097 ***	0.04
Financial and insurance			0.483 ***	0.05			0.446 ***	0.04			0.483 ***	0.05			0.446 ***	0.04
Professional and administrative			0.205 ***	0.03			0.182 ***	0.03			0.205 ***	0.03			0.182 ***	0.03
Health and social services			0.219 ***	0.04			0.203 ***	0.04			0.219 ***	0.04			0.203 ***	0.04
Public administration and defence			0.326 ***	0.04			0.303 ***	0.04			0.326 ***	0.04			0.303 ***	0.04
Trade and repair			0.204 ***	0.03			0.196 ***	0.03			0.204 ***	0.03			0.196 ***	0.03
Construction			0.184 ***	0.03			0.189 ***	0.03			0.184 ***	0.03			0.189 ***	0.03
Education			0.267 ***	0.05			0.219 ***	0.04			0.267 ***	0.05			0.219 ***	0.04
Hospitality			0.113 ***	0.03			0.109 ***	0.03			0.113 ***	0.03			0.109 ***	0.03
Manufacturing and others			0.276 ***	0.04			0.272 ***	0.04			0.276 ***	0.04			0.272 ***	0.04
Transport and communication			0.301 ***	0.04			0.288 ***	0.04			0.301 ***	0.04			0.288 ***	0.04
Education attained (Primary education=0)																
Lower secondary education					0.133 ***	0.03	0.106 ***	0.03					0.133 ***	0.03	0.106 ***	0.03
Upper secondary education					0.278 ***	0.04	0.200 ***	0.04					0.278 ***	0.04	0.200 ***	0.04
Tertiary education					0.575 ***	0.04	0.373 ***	0.03					0.575 ***	0.04	0.373 ***	0.03
Second-level variables (within-country)																
GDPpc per capita (differentiated)	0.003	0.01	0.004	0.01	0.002	0.01	0.003	0.01	0.003	0.01	0.004	0.01	0.002	0.01	0.003	0.01
Gini index (differentiated)	−0.007	0.01	−0.009	0.01	−0.007	0.01	−0.008	0.01	−0.007	0.01	−0.009	0.01	−0.007	0.01	−0.008	0.01
Third-level variables (between-country)																
GDP per capita (mean)	0.048 ***	0.02	0.046 ***	0.02	0.048 ***	0.02	0.047 ***	0.02	0.047 ***	0.02	0.046 ***	0.02	0.047 ***	0.02	0.046 ***	0.02
Gini index (mean)	0.045	0.04	0.048	0.04	0.048	0.04	0.049	0.04	0.037	0.04	0.038	0.04	0.038	0.04	0.039	0.04
Number of observations	116,192		114,614		116,192		114,614		116,192		114,614		116,192		114,614	
Number of groups level 2	74		74		74		74		74		74		74		74	
Number of groups level 3	28		28		28		28		28		28		28		28	
Log pseudolikelihood	−74,859.59		−65,504.18		−69,715.49		−84,002.02		−74,859.59		−65,504.18		−69,715.49		−84,002.02	

Source: EU-SILC (Eurostat) and own elaboration. Note: *** denotes significance at 1%; **, at 5% and *, at 10%. Fixed time effects have been added for each wave.

become resilient and those who do not, once these observable variables are controlled for. Therefore, despite the fact that resilient individuals earn better wages, mainly due to their higher educational level, this result confirms that resilience has no statistically significant effect. We can infer from this result that the great difference between the two groups lies in level of education, and that no unobservable variable is relevant.

This does not mean, however, that resilient individuals do not have some superior soft skills, which could be absorbed by the other variables in the model, since they are relevant in terms of labour market outcomes (Heckman et al., 2006).¹⁶ If this were not the case, the higher motivation or the greater capacity for effort entailed in educational resilience may not be reflected in wage levels, but it does facilitate a higher employment quality or greater job stability, among other examples, which go beyond the scope of the present study.

Model 5 of Table 3 shows an initial comparison without controlling for educational level nor variables related to occupation and activity between resilient individuals and socioeconomically advantaged individuals, the reference category in this case. This model reveals no significant differences between these two groups of individuals, even though the first group have a higher educational level (about 90% have the maximum possible educational level) and a higher proportion of individuals (69%) working in the best placed occupations.

A similar result is obtained in model 6 in the same table after controlling for type of occupation and sector of activity. In other words, given the sector of activity and the type of occupation, there are still no significant differences between resilient and advantaged individuals. Education appears to fulfil its aim of driving the social elevator. However, when educational level is controlled for, significant differences appear between the two groups of individuals as can be seen in models 7 and 8 in the table. Once again, therefore, it is education that explains the change in these comparisons.

Model 8 of Table 3 seeks to quantify the difference found between these two sets of individuals. As can be seen in the dichotomous variable of resilience, and bearing in mind that the reference category is now advantaged individuals, we can conclude that there is a statistically significant difference between the two sets of individuals in favour of those who faced fewer socioeconomic difficulties, a priori, throughout their lives. This unexplained difference, of 5.6%, mainly appears after controlling for educational level, where the resilient individuals are in a better position.

This kind of residual could be considered a glass ceiling, referring to everything that prevents resilient individuals, as people from disadvantaged backgrounds, from achieving the same wage levels as those who start out from more advantaged family situations and backgrounds. Moreover, the effect of this glass ceiling may be undervalued since it is measured exclusively in terms of wage. Bearing in mind that wage represents a lower proportion of the total income of the most advantaged individuals, the glass ceiling that disadvantaged individuals must break in order to achieve the same income and wealth as the most advantaged could be much bigger.

Therefore, although resilient individuals must make a higher relative effort –economic or otherwise– and therefore their investment and efforts a priori are greater, the individual with more socioeconomic advantages will end up earning a higher wage per hour given their educational level and controlling for the other variables. Hence, we can conclude that although education is a good tool for driving the upward social elevator, it has certain limitations in that it does not fully eliminate the economic effects of environment in adulthood.

A variety of situations may explain this glass ceiling resilient individuals face. Advantaged individuals come from a background that provides them with more relational capital, and personal, professional and educational information, as well as the specific skills needed in sectors dominated by the highest social classes, which in turn are those that tend to be better paid (OECD, 2018a). Because the database provides information on educational level only, we are unable to explore details such as academic field studied or the type of institution attended. Advantaged individuals are more likely to attend better quality schools and colleges (Chetty, 2017), to have access to training or education leading to better paid occupations (Campbell et al., 2022) and to continue learning outside formal settings during their lives (Pérez et al., 2012). Therefore, the greater economic advantages, resources and contacts these individuals have outweighs the potential effect of such important soft skills as motivation or effort displayed by resilient individuals in the education system.

Hence, bearing in mind that the analysis in this study cannot suggest a direct causality, the results seem to contradict our two hypotheses. The main hypothesis, that there were no differences between advantaged and resilient individuals, is contradicted by the glass ceiling mentioned above. In turn, the second hypothesis, which proposed a positive effect of resilience among disadvantaged individuals, can also be rejected in light of the results presented in this section, although with some reservations. What is clearer is that education is responsible for improving the wages of resilient disadvantaged individuals.

4.3. Policy recommendations

In any case, although the effects of resilience do not appear to go beyond education, greater resilience would imply a better educated disadvantaged population. For this reason, the public administration should promote and encourage educational resilience since it has positive effects on disadvantaged individuals in socioeconomic terms, which favors equality of opportunity and a more effective upward social elevator. Economic policy recommendations should therefore be made that favor equality of opportunities in education, since this equality is then transferred, to some extent, to society as a whole.

As previous studies have demonstrated (Agasisti et al. 2017; Vicente et al., 2021), to be fully effective policies should take into

¹⁶ Model 4 was replicated with educational level 3 only (upper secondary education) to compare disadvantaged resilient and non-resilient individuals with the same educational level; the result was the same (model is available on request). It therefore seems to be fairly implausible that the effects of resilience are absorbed by level of education.

account the situation of each region or country. Lack of resources can negatively affect equality of opportunity and educational resilience, which would hinder the efficient workings of the social elevator. Previous studies examining the determinants of educational resilience have found that public spending is particularly important to resilience in less developed countries with a lower per capita income (Agasisti et al. 2017; Vicente et al., 2021). For the case of countries with a higher per capita income, spending efficiency and stimulating human capital, especially teachers, are the directions that should be followed to improve resilience and with it, equality of opportunities (Vicente et al., 2021).

In turn, public policies should be designed to reduce the differences between resilient and advantaged individuals deriving from socioeconomic background. Some possible public policy in this sense would be to actively help socioeconomically disadvantaged students with assistance programs, such as scholarships or comprehensive family support.

Besides, one of the main reasons why the glass ceiling exists is that disadvantaged individuals have less information, because to a large extent they attend inferior educational institutions (Chetty, 2017) and study for careers that are less well remunerated (Campbell, Macmillan, Murphy, & Wyness, 2022), due to limitations that are not only monetary. While the first case could be partly explained by the lack of resources, this is not so in the case of choice of studies (Campbell, Macmillan, Murphy, & Wyness, 2022), which is mainly explained by the available information and personal tastes (also influenced by initial socioeconomic background). Therefore, public policies should design any measures targeted to improve information or environmental inequalities, other than resources, such as reinforcing educational orientation or promoting education at earlier stages in life (Heckman, 2011), should be taken into account. In this sense, we consider especially relevant the career guidance's role in school to compensate the effect of the lack of information on the socioeconomically disadvantaged students (Musset & Kurekova, 2018).

Nevertheless, a cross-sectional approach should be taken to equality of opportunities, by combining policies affecting the education system with social protection policies, which could have significant effects for reducing inequalities (Solga, H, 2014), with all the positive consequences that can entail.

5. Conclusions

The principal aim of this paper was to study the implications on wages of educational resilience, mainly by comparing socioeconomically disadvantaged resilient individuals with advantaged individuals (Hypothesis 1). That is, we attempted to analyze whether overcoming adversity in education by achieving a higher educational level than expected paid off in adulthood by eliminating differences related to initial socioeconomic background, or at least in terms of wage. The idea for the study stemmed from the need to continue previous work in educational economics exploring the determinants of educational resilience and the percentage of resilient students as a proxy variable for equality of opportunity in education.

To this end we used, for the first time in this field, a standardized European database, the European Statistics of Income and Living Conditions or EU-SILC with data between 2005 and 2019, but mainly using the waves that include the module "Intergenerational transmission of disadvantages" (2005, 2011 and 2019). The information these modules provide about the surveyed population's initial background was crucial for the type of analysis undertaken since it covers both initial socioeconomic background and wages in adulthood. The wealth of information provided in the EU-SILC therefore enabled us to replicate the initial socioeconomic background indicator used in PISA (ESCS), the most prestigious database used in analysis of educational resilience, for all the survey respondents through the first component of the principal component analysis. In this way we were able to connect individuals' pasts with their present as adults obtaining a pseudo-ESCS.

As well as the novel use of the EU-SILC database and the above-mentioned module, the study contributes an additional methodological innovation by identifying resilient individuals through multilevel probit regressions at two levels, the individuals and their countries. Resilient individuals are those who, given their disadvantaged socioeconomic background, have successfully surpassed the educational level expected of them. These individuals are understood to be relatively similar to the educationally resilient individuals studied in previous literature, but literature, but have now reached adulthood.

Having identified a set of resilient individuals and classified the rest of the sample into non-resilient disadvantaged, advantaged and the rest, we compared gross wages per hour measured in purchasing power parity euros. As expected, resilient individuals earned higher wages than non-resilient disadvantaged individuals. However, once all the observable variables, especially education, were controlled for, the differences in wages were not statistically significant. We obtained this result using multilevel hybrid regressions, which is not a widely used methodology but is particularly powerful for this type of analysis. This difference was obtained by controlling for education, sex, age (and its decreasing returns), country of birth, civil status, type of working day, sector of activity, type of occupation, GDP per capita (and its fluctuations), Gini index (and its fluctuations too) as well as fixed time effects.

Given that no significant difference was found through dichotomous variables for the socioeconomic classification of the above-mentioned sample, it appears that there are no relevant unobservable variables at the wage level that favour resilient individuals, thus contradicting our second hypothesis, which posited the existence of positive unobservable effects for resilient individuals. This type of residual is related to the soft skills expected of individuals who have successfully overcome the adversities of the education system. However, the finding does not lead us to conclude that soft skills were unimportant for resilience, nor that they were not valued in the labor market. In fact, the effects of educational resilience could be absorbed by the other control variables, which opens an interesting line for future research.

The main research hypothesis posited that there would be no wage differences between resilient disadvantaged and advantaged individuals, related to equality of opportunities and social mobility. This hypothesis appeared to be supported until educational level was controlled for, when significant differences began to emerge. If we take into account all the observable variables, there is a difference in favor of the most advantaged, who earn an average of 5.6% more per hour than resilient individuals. This result leads us to

reject our principal hypothesis that there would be no wage differences between these two types of individuals. The finding appears to suggest that despite having overcome adversities related to their background, resilient individuals did not reach the wage levels earned by the socioeconomically advantaged, who had more resources and enjoyed more favorable conditions that combine to create what has been called the glass ceiling.

The existence of this glass ceiling may be explained by the better network of contacts, and more and better quality information available to advantaged individuals and a greater availability of resources in general. This information helps them to access better opportunities and to take better decisions on what line of study to follow in order to reach positions higher up the corporate ladder and to have more favorable conditions to develop the specific skills required in the sectors with a greater presence of higher social classes, which at the same time are the most highly paid sectors. In addition, this glass ceiling may be explained by the better education in foreign languages or in non-formal education available to advantaged individuals, both during their years of education and throughout their working lives. All these favorable conditions available to advantaged individuals, including resources, appear to make up for and trump the expected advantages associated with the better soft skills, such as motivation or capacity for hard work, that the resilient individuals have shown during their years in education and that have allowed them to overcome the adversities associated with background in the educational setting. Furthermore, it should be noted that the glass ceiling measured in this study is exclusively based on wage and, bearing in mind that wage has less weight in the case of advantaged individuals, the difference is likely to be greater in terms of income or wealth.

Educational resilience should therefore be promoted, since although resilience, on its own, does not seem to break through the glass ceiling, the more resilient disadvantaged individuals there are, the greater the equality of opportunities will be both within and outside the education system. For this to occur, depending on the country's wealth, more and better investments should be made in economic resources that value human capital and aim to reduce the effects of socioeconomic differences between individuals from the earliest stages of education. These measures should also go beyond the education system and be combined with social protection measures to tackle the problem cross-sectionally.

In conclusion, this study has shown that educational resilience, namely disadvantaged individuals overcoming adversities during their years of education, implies an improved wage per hour related to achieved educational level. However, it appears that resilience on its own, that is, beyond the effect of obtaining a relatively high educational level, does not have a positive effect on wage per hour. This is because resilience and education are insufficient to overcome certain limitations, and there is a glass ceiling that prevents resilient individuals from achieving the same wages as individuals from a more favourable socioeconomic background, despite the better soft skills expected.

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Declaration of Competing Interest

There are no competing interests to declare.

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