A great depression? Students' educational aspirations and investments in the aftermath of the Great Recession*

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Abstract

We study how economic downturns shape human capital accumulation by affecting adolescentsâ educational aspirations and subsequent academic effort and choices. Using student census data matched with administrative records, we construct an individual-level measure of exposure to local labor market conditions based on the share of school peers with unemployed parents. Identification exploits quasi-random variation in exposure across adjacent cohorts within the same school. We find that greater exposure to adverse business cycle conditions significantly reduces students' aspirations to pursue tertiary education and also negatively affects subsequent outcomes, including high school GPA, college enrollment and dropout.

JEL Classification: I21, I23, J24, E32

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. . . there are many reasons why today we usually do not like studying any more [. . .]. Nowadays, I would add another reason, a very recent one, a very creeping one, always on the edge of becoming an alibi: the economic crisis. We do not want to study any more because there are no jobs, thus, why should we study if studying doesn't help us to reach anything? Everywhere this rigmarole.

Paola Mastrocola, *The rebel passion [La passione ribelle]*, Laterza 2017 (p. 101).

1 Introduction

Over the past two decades most advanced economies have faced several periods of severe economic turmoil. One should first mention the Great Recession (2007-2009), the following Sovereign Debt crisis (which hit several European countries in 2010-11), but also the world-wide economic crisis caused by the COVID-19 pandemic, and the recent inflationary shocks. While there is a well-established literature on how macroeconomic conditions affect labor market trajectories and careers (von Wachter, 2020), the evidence on how they might also affect decisions to invest in human capital is more scarce and mainly concentrated on the contemporaneous choices of college students (Adamopoulou and Tanzi, 2017; Long, 2014).

However, economic downturns might affect the accumulation of human capital of a much larger set of individuals, and not only those who are effectively called to make relevant education or labor market choices in recession times. In this paper, in particular, we shed light on whether and how economic downturns might affect also those who at the time are still in education *via* a change in their *aspirations* about their future educational attainment (what we label as *educational aspirations* following La Ferrara (2019)).[1] By observing a worsening of the economic conditions around them, students may reconsider their life goals and thus revise downwards also their educational aspirations; this may then translate into lower human capital investments and thus lower educational attainment and income in the long run (Ray, 2006; Genicot and Ray, 2017; Dalton et al., 2016; La Ferrara, 2019).

Our empirical analysis uses individual-level census data on educational aspirations – i.e., their stated willingness to enroll in university – for eight consecutive cohorts of 10th-grade students in Italian high schools and links them to a built-in proxy of local economic downturns, captured by the share of schoolmates with unemployed parents.[2] We then link these educational aspirations with a number of subsequent educational outcomes, such as completing high school, the grade obtained at the high school diploma, university

[1] Aspirations are defined in the literature as individuals' incentives to invest and encompass their hopes or ambitions of achieving certain life goals (Genicot and Ray, 2017; La Ferrara, 2019) (see Section 3).

[2] In our setting, schoolmates and their families represent the "aspiration window", that is, the subset of individuals who influence the formation of one's aspirations through social interaction (Ray, 2006; Genicot and Ray, 2017).

enrollment and dropout. The data used in the analysis are unique as they merge census data provided by the Italian Education Authority (*Invalsi*), which cover the universe of 10^{th} grade students enrolled in Italian high schools, with administrative data from the National Students' Registries held by the Education and University Ministries. Building on the literature on peer effects in the school pioneered by Hoxby (2000), identification is achieved by exploiting the within school cohort-to-cohort variation in the share of peers with unemployed parents, and by controlling for several individual, class and school level time-variant characteristics, and for school-specific time trends.

We find that increasing exposure to peers with unemployed parents by 1 percentage point (p.p.) determines a decrease of about 0.05 p.p. in the probability of aspiring to enroll in tertiary education. The effect is sizable and economically meaningful, corresponding to about 1/10 of a SD. Indeed, our estimates imply that students in cohorts with relatively high exposure (at the 75^{th} percentile of the exposure distribution) are approximately 14 percent less likely to aspire to a tertiary education degree than those in cohorts with relatively low exposure (at the 25^{th} percentile).

Importantly, the negative effects observed on aspiration formation translate into subsequent educational choices and effort, as measured 3 to 4 years later. We document that exposure to peers with unemployed parents at the moment when the aspirations are stated (i.e., in grade 10) negatively affects the effort exerted to complete high school, the likelihood of enrolling at university, and the probability of dropping out of it by the end of the freshman year. In line with the predictions in the theory of aspirations (Genicot and Ray, 2017), we also find evidence that the relation between aspirations and subsequent investments is non-monotonic so that those who revise their educational aspirations and investments the most are those from relatively better-off families. These indeed are the students who are more likely to be at the margin of investing in tertiary education, while for those from more disadvantaged families tertiary education objectives may be too high to reach as a goal.[3] Finally, we combine our evidence in an IV setting to isolate the – large and economically relevant – nexus between aspirations and actual human capital investments.

To the best of our knowledge, our empirical analysis is the first to link large-scale administrative data on students' aspirations, collected on a census basis, to the educational decisions they subsequently make. Compared to existing literature, our work contributes to three main areas: first, the effects of cyclical macroeconomic conditions on human capital accumulation; second, the influence of individuals' aspirations on economic decision-making; and third, the impact of school peers' parents' characteristics on educational choices.

As to the first aspect, it has been shown that macroeconomic conditions affect *contemporaneous* educational choices (such as university enrollment, choice of college major,

[3]These results are also in line with what is found by Rizzica (2020) in the UK.

dropout). Overall, the available evidence suggests that education is counter-cyclical, with students spending more time in education when economic conditions are poorer (i.e, the opportunity cost of studying is lower). For example, Long (2014) shows that during the Great Recession in the United States college attendance levels increased overall. Similarly, Adamopoulou and Tanzi (2017) show that the Great Recession decreased the probability of dropout during college.[4] We contribute to this strand of literature by providing evidence that macroeconomic downturns can influence human capital accumulation to a larger extent by also affecting the aspirations, hence the *future* educational choices and effort, of adolescent students (Rizzica, 2020; Favara, 2017; Ross, 2019; Guyon and Huillery, 2020).[5]

Secondly, we speak to the growing literature on aspirations, and in particular those concerning education (La Ferrara, 2019). Only a few papers have investigated what factors can shape aspirations, and specifically, educational aspirations, and how such changes translate into actual investments in education. Rizzica (2020), for instance, analyses a policy implemented in the UK aimed at raising the aspirations of pupils from low socioeconomic background to increase their participation in college education. The policy successfully raised the aspirations of the target students, but only for those from relatively less deprived households did participation in post-compulsory education increase. Concerning the specific relationship between economic conditions and aspirations, using the British 1958 NCDS cohort data that follow individuals for nearly 60 years since birth, Lekfuangfu and Odermatt (2022) show that aspirations are largely influenced by parents' socioeconomic status, by parents' own aspirations for their children, and by children achievements. On the other hand, the geographical correlation between local labor market conditions and aspirations is never statistically significant, pointing to a limited or nihil impact of economic conditions in the local labor market on individual aspirations.[6] Watson et al. (2025) use Canadian data collecting educational aspirations of youths and their parents' and show that the incidence of poverty is associated with both mothers and children reducing their aspirations about child's educational attainment. While in both studies the link between economic conditions and aspirations' formation is mainly correlative in nature, we provide sufficiently clean causal evidence focusing on more narrowly defined aspiration windows (Ray, 2006) to isolate exogenous variation in individual

[4]Other papers document changes in the college major choice during recession times, pointing to a shift towards fields related to the industrial sectors less affected by the recession (Liu et al., 2019; Weinstein, 2017).

[5]A larger literature analyzed the effects of the business cycle on education and labor market outcomes prevalently focusing on the short- and long-run labor market effects of graduating during a recession (see von Wachter (2020) for a recent review and Choi et al. (2025) for a recent contribution), finding sizable negative short- and long-run effects of business cycle conditions, as generally proxied by the unemployment rate, on earnings, wages and career prospects.

[6]Taylor and Rampino (2014) also reach similar conclusions using the British Household Panel Survey (BHPS), though they emphasize possible relevant heterogeneity based on some salient parents' characteristics (e.g. education titles and attitudes toward education).

exposure to economic downturns. In this respect, we are close to Iwo et al. (2024) who also manage to provide causal estimates of the impact of economic and social deprivations experienced following the 2004 tsunami in Indonesia on students' aspirations, finding that damage to the student's community depresses aspirations, but only in the short term.

Finally, our work is related to a well-established literature on the effects of school peers' composition on educational, labor market, and family outcomes. This literature was pioneered by the seminal contribution by Hoxby (2000), who demonstrated the fundamental importance of the peers' interactions based on gender and native status differences. Recent contributions have also showed that other salient characteristics of the peers might influence students' outcomes. Mertz et al. (2025) show that exposure to a higher share of female peers with entrepreneur parents encourages girls' entry and tenure into these occupations, thus narrowing the entrepreneurship gender gap. Cattan et al. (2025) show that exposure to school peers with elite-educated parents increases peers' enrollment in elite programs. Interestingly, and in line with our work, these two contributions have moved the attention from peers' to peers' parents' characteristics and still focus on high school as a crucial turning point in shaping future outcomes.[7] In turn, our analysis highlights a novel peer-based channel through which macroeconomic shocks transmit to long-run human capital formation.

Understanding what drives students' aspirations is also particularly relevant for policy making. To the extent that aspirations do affect educational achievements (Rizzica, 2020; Khattab, 2015), understanding whether or not they may be depressed by bad macroeconomic conditions can help to design early-intervention policies to counter balance such negative effects. Focusing on young students is of paramount importance as they could be both particularly sensitive to aspiration contractions, but also more malleable to corrective policy measures. Note that we focus on a crucial moment in each student's life, that is close to the end of compulsory education when they are called to make life-changing decisions about their future.

The paper proceeds as follows: Section 2 describes the institutional setting and the background; Section 3 describes the conceptual framework that will drive our empirical analysis; Section 4 describes the data used and provides descriptive evidence; Section 5 illustrates the empirical strategy and discusses the main identifying assumptions; Section 6 comments on the main results; Section 7 illustrates the robustness and sensitivity checks; Section 8 discusses the heterogeneous effects and some alternative channels which might drive our results; in Section 9 we seek to isolate the impact of aspirations on schooling;

[7] There may also be a direct effect of parental job loss on children's educational outcomes. By focusing on peers' parents, while controlling for own parent employment status, we are able to isolate the effect that passes through a change in aspirations from that due to a negative shock to own family income. Moreover, the evidence in the existing literature (Carneiro et al., 2022; Drydakis, 2023) supports two key elements in our analysis: on the one hand, the focus on the years of adolescence as those powerfully shaping later-in-life outcomes; on the other hand, the attention to high school completion and university enrollment as potential outcomes.

finally, Section 10 concludes and provides some policy implications.

2 Institutional setting and background

2.1 The Italian schooling system

Italian schooling system consists of three different levels of education: five years of primary school (grades 1 to 5, ISCED level 1), three years of junior-high school (grades 6 to 8, ISCED level 2), and five years of high school (grades 9 to 13, ISCED level 3), to be chosen among three main tracks: academic, technical, and vocational.[8]

Compulsory education ends with the completion of grade 10.[9] Students are then free to drop out from the schooling system, though they are obliged to attend either a professional course or to start an apprenticeship contract, which should last until they reach age 18 and should be aimed to the acquisition of a three-years professional degree.[10] Those who decide to continue education sit for a final examination to get their high school diploma at the end of grade 13. The high school diploma is mandatory to access university and comes with a GPA expressed in points (from a minimum of 60 to pass to the maximum of 100 *cum laude*).[11]

In high school, students have several teachers, one for each subject, and are expected to gain knowledge on a wide range of skills. The subjects vary a lot depending on the path chosen, but always entail a core instruction in Italian language, math and English (as the main foreign language). Students at all grades and tracks follow formal classes along the whole school year (lasting from mid-September to mid-June) but also participate to programs of training and on-site eduction in firms or Institutions. Grade retention is possible if, based on teachers' marks and evaluations, the student does not attain the minimum level of skills required for the completion of each grade.[12]

[8]The academic track is designed for students who aim to attend university; the technical track allows students to acquire skills that are both theoretical and practical, letting them continue with tertiary education or look for a job (e.g. accountant, surveyor, technician); the vocational track, instead, focuses on endowing students with vocational skills, which are essential to find a job right after high school.

[9]Children enroll in the first grade of primary school the year they turn six, start junior-high school when they turn eleven, and enroll in the first grade of high school (grade 9) the year they turn fourteen. Students must also turn 16 before legally dropping out: this happens in grade 10, and, only for those born in the last quarter of the year, by the beginning of grade 11.

[10]Professional courses are organized on a regional level and are typically aimed at preparing for a low-skilled manual job (e.g., waiter, cook, hairdresser, beautician, etc.); with an apprenticeship contract the youth starts her working path.

[11]In our empirical analysis 100 *cum laude* is coded to 101. The high school GPA is the sum of several components. A maximum of 40 points can be cumulated by the student depending on the academic performance at end of grade 11, 12 and 13. Then, a maximum of 60 points can be gained in the formal tests at the end of grade 13 (20 points in each of the two written tests and 20 points in an oral test). These final tests are supervised by a commission composed by both teachers who taught to the students in grade 13 and external teachers from other schools.

[12]The standardized tests performed under the Italian National Evaluation Program cannot be used to determine this choice (see the following subsection). The individual results for each student remain

In order to study students' aspirations we make use of eight consecutive cohorts of tenth grade students (i.e., attending the second year of high school) from all tracks. Recent contributions have shown that during adolescence, educational attainment and choices are particularly sensitive to the economic and family context to which the student is exposed to (Carneiro et al., 2022). Indeed, grade 10 is a crucial turning point in individuals' life as students know that they will be asked to decide whether to continue formal education or drop out from school by the beginning of grade 11. At that time, students are likely forming their aspirations concerning their future educational choices, notably based on family and teachers' advice, and their own and peers' experience (Ray, 2006).

2.2 The National Evaluation Program of Students' Achievement

The Italian Education Authority (*Invalsi*, from the Italian acronym)[13] started the National Evaluation Program of Students' Achievement (henceforth, NEPSA) in the school year 2009-10. The NEPSA has a yearly and census nature: every school year all students in grades 2 and 5 (primary school), grade 6 (junior-high school), and grade 10 (high school) sit a reading and a math standardized test, typically between April and early May. In some grades and school years, students are also asked to fill in a *Student Questionnaire*, which provides additional information on students and families.

The Invalsi NEPSA is not a high-stakes test: the results of the evaluation have the purpose of assessing the school's performance from one year to another and are not part of a proper school accountability system granting schools additional funding or rewarding teachers. Moreover, the tests results are returned to the schools at an aggregate level so that neither the teachers nor the students have direct access to their individual-level scores or *Questionnaire*. The individual-level data are available for research purposes, correlated with basic individual-level characteristics (such as: gender, age, non-native status, grade retention, class and school anonymous identifiers). The *Questionnaire* can be linked to the standardized tests by means of an anonymous individual-level identifier, while the school identifier makes it possible to follow schools along the years.[14]

For the purpose of our study, we focus on the NEPSA of eight successive cohorts of 10^{th}-grade students, from school year 2010-11 to 2017-18, as in these years students were asked a question in the *Student Questionnaire* about their future educational aspirations (see Section 4 for details).

unknown to the same students and teachers.

[13] *Istituto Nazionale per la VALutazione del SIstema educativo.*

[14] Other works have used information derived from these questionnaires: see, among others, Di Liberto et al. (2023); Pagani et al. (2021); De Benedetto and De Paola (2022).

2.3 The Great Recession, the Sovereign Debt Crisis and the (slow) recovery

Our empirical analysis covers a period spanning from 2010 to 2018, a turbulent economic time in Italy, as in most Western countries, especially in Europe. These were the years which followed the Great Recession (2007-2009),[15] and the Eurozone faced an additional period of severe economic downturn known as the Sovereign Debt crisis. In July 2011 the Italian Public Bonds reached an interest rate of about 7%, inducing a huge increase in the cost of public financing (similarly to Spain, Ireland, Portugal and Greece). In November 2011 the spread with respect to the corresponding German bonds (the target of secure assets) reached 570 points, from an average of about 200 in the previous months. The crisis called for huge interventions from the European Central Bank, and the slow recovery only started in the year 2014 (Grande et al., 2013).

The crisis also had severe consequences in the real economy and, ultimately, in the labor market (von Wachter, 2020). Italy experienced the sharpest relative increase in the unemployment rate among EU economies mainly hit by the crisis (Appendix Figure A1). The unemployment rate peaked in 2014 and the Italian National Bureau of Statistics (Istat) recorded in those years the sharpest increase in the year-to-year variation of the unemployment rate since the late 1970s (Appendix Figure A2). The substantial variability in economic conditions during those years helps us precisely identify the effects under study.

3 Conceptual framework

Aspirations, i.e., where you want to get or what you want to achieve, are the engine of individual decisions to invest (Genicot and Ray, 2017). In our setting, students choose how much to invest in human capital accumulation in response to changes in their aspirations for social status (La Ferrara, 2019). Educational investments are, in other words, the means for reaching a higher position in life. In principle, the higher your aspirations, the more you will exert effort to achieve them. Hence, understanding, how aspirations are formed, how they can be influenced, and how they translate into effort and investments, is of paramount importance (Genicot and Ray, 2020).[16]

Thanks to our rich and large administrative data, which link students' aspirations and subsequent behavior, in our empirical investigation we will explore the two main settings in which the theory of aspirations can be generally partitioned (Genicot and Ray, 2020).

[15] The Great Recession refers to the economic downturn from 2007 to 2009, which followed the bursting of the U.S. housing bubble and the global financial crisis. It was the most severe economic recession in the United States since the Great Depression of the 1930s.

[16] Note that aspirations may well differ from what is rationally achievable, i.e., from *expectations*. In the data we use (see Section 4.1), based on the wording of the question, we consider students' answers as the statement of their future educational aspirations (La Ferrara, 2019).

First, we will focus on some aspects pertaining to the domain of how aspirations are formed. Then, we will investigate how aspirations might influence subsequent behavior.

Turning to the first domain, according to the theories developed in Ray (2006) and Genicot and Ray (2017), aspirations are not innate but rather socially determined, i.e., individuals set what to aim at on the basis of the observation of the distribution of outcomes (typically income and wealth, i.e., status) in the society and on their position within such distribution. Importantly, not all society influences individual aspirations, but rather only the individual's cognitive world, i.e., her zone of similar or attainable individuals. This zone is formally conceptualized in Ray (2006) and is labeled *aspiration window*. In our setting, the student's aspiration window will be formed by the status of her peers' families. This is a very narrow definition of window, one expects that adopting a broader definition would generate milder results in terms of students' reactions. As a result, an economic downturn perceived through one's aspiration window can be expected to reduce educational goals, as the distribution of potentially attainable outcomes shifts leftward.

Exploring how aspirations translate into subsequent investments is certainly one of the most interesting and less studied domains of such theories (Genicot and Ray, 2020). In our context, we observe students stated educational aspirations in grade 10, then we are able to link them to some notable educational investments undertaken in the following years, such as getting the high school diploma and enrolling at university. Before starting the empirical investigations, one should acknowledge that a central aspect of the theory of aspirations states that it is the gap between aspirations and one's starting status, rather than the level of aspirations *per se*, what moves individuals' investments. However, the relation between this *aspiration gap* and investments is non-monotonic: opening the eyes to new opportunities, i.e., raising aspirations, generally stimulates more investments to achieve them, but when aspirations are set too high – i.e., the aspiration gap is too large –, higher aspirations may instead depress investments as the new aspired targets may eventually appear unachievable given the starting point, and thus generate frustration.[17]

In turn, given the underlying theories of aspirations formation and how they affect investment decisions, we can derive two main testable implications for our setting:

(i) A recession observed within one's cognitive window lowers educational aspirations.

(ii) A drop in aspirations will affect investment in education in a potentially non-monotonic way, as investments may decrease, increase or remain unaffected depending on whether initial aspirations were too high or not relative to the starting state (i.e., the aspiration gap was too large).[18]

[17] To ease the illustration of the conceptual relation between aspirations and investments, in Appendix Figure A3 we report a simple graphical representation of such non-monotonic relation, as derived from Genicot and Ray (2020).

[18] More specifically, in our case the observation of a drop in aspirations – based on implication (i) – might

Additionally, we are able to test some alternative mechanisms. Specifically, one may argue that investment in education may decrease because during a recession students revise downwards their *expected* returns to education (Morgan, 1998). If this were the case, the effect should be driven by the status of parents with higher education (relative to that of those without). Finally, we may shape the aspiration window so as to also include insights from the theories of *role models* and test them empirically. In particular, we may suppose that girls are more impressed by what happens to mothers of peers and boys by what happens to fathers (Beaman et al., 2012; Olivetti et al., 2018; Mertz et al., 2025).

4 Data, variables and descriptive statistics

We link the individual-level census data of the Invalsi NEPSA on students in grade 10, containing information on students' educational aspirations, with individual-level administrative records on high school completion and university enrollment. In this Section we present the main features of the data sources and provide some preliminary descriptive evidence.

4.1 Students' aspirations

The Invalsi NEPSA archives for 10^{th} grade students in the school years (s.y.) from 2010-11 to 2017-18 contain a question about educational aspirations. Specifically, in the *Students' Questionnaire*, undertaken by all students at the end of the formal assessment tests in math and Italian language, the student is asked to state the highest level of education she would like to acquire in her nearest future. The question states: *Which is the highest educational title you would like to attain?: A. None (I study until the end of the compulsory education); B. Three-years vocational certificate; C. High school Diploma; D. University degree; E. Master or PhD after university.*[19] Notice that the tenth grade in high school

determine two different sets of potential effects on educational investments. If a student is characterized by a large aspiration gap, then it would be unlikely that a drop in aspirations could move her across the aspiration threshold which separates the frustration from the satisfaction area (see Appendix Figure A3). As a result, the student would have little incentives to change her educational investments. Conversely, for those who are characterized by small aspiration gaps, it would be more likely to lie in the satisfaction area or in the frustration area close to the aspiration threshold, so that a drop in aspirations would determine, respectively, a drop or an increase in investments, depending on the staring state and on the magnitude of the shock.

[19] We interpret this formulation as capturing students' educational aspirations rather than expectations, which would also embed students' considerations on possible constraints, and on the realistic attainability of the goal. Our interpretation is in line with Di Liberto et al. (2023), who also use this variable to evaluate how managerial practices from the schools principals affect students' outcomes (and aspirations among others), and Taylor and Rampino (2014) using the BHPS. A similar question for students' *expectations* is included in the OECD PISA data and explicitly asks to the students which is the highest level of education they *expect* to gain. In any case, studies which focused on both aspirations and expectations find that the two are strongly correlated (Carlana et al., 2022).

still belongs to the compulsory schooling path, so that all 15-year-olds must still attend some high school (either in an academic, technical or professional track), and sit the NEPSA assessment. Moreover, students are well aware that in about some months they will be asked to decide whether to continue formal education, exit from the schooling system to look for a job or enroll in a professional course (see Section 2.1).

From the question above we create a dummy variable stating whether the student aspires to enroll at university or not (*Aspiration Tertiary, AT*).[20] Formally, for each student i in school s and cohort c in year t we obtain:[21]

$$AT_{isct} = \begin{cases} 1 & \text{if the student aims to} \\ & \text{enroll in university} \\ 0 & \text{otherwise} \end{cases} \tag{1}$$

The NEPSA archives also contain individual-level information on several students' and families' characteristics, such as gender, age, grade retention, native or non-native status, parental education and current employment. These are obtained from the *Students' Questionnaire* and from school administrative records and can be linked to the results of the standardized tests through an anonymous student identifier. Crucially for our analysis, from the *Students' Questionnaire* we can retrieve for each student information about the parents' occupational status (at the time of the assessment). Assuming that each student's set of same cohort schoolmates could represent a possible proxy of her aspiration window (Genicot and Ray, 2017), we define our main explanatory variable $UP_{sct}^{(-i)}$ as the share of schoolmates who have at least one unemployed parent (excluding student i):

$$UP_{sct}^{(-i)} = \frac{\sum_{j \neq i} ParentUnemployed_{sct}}{n_{sct} - 1} \tag{2}$$

This variable is meant to capture variations in the business cycle as perceived by the student, i.e., those concerning her closest peers. In the later Sections we will also replicate our main results using different definitions of the explanatory variable (e.g. differentiating by unemployed parent's gender, educational title, or using wider or narrower reference groups).

Finally, the NEPSA archives also contain anonymous school identifiers, which make it possible to follow schools over time, and anonymous class identifiers, which make it possible to take into account class-level characteristics.

[20] AT takes value 1 for options D and E and zero for options A, B and C of the aforementioned question.

[21] Note that here and in the rest of the paper we intend for school cohort (c) all tenth-grade students enrolled in a given school year, while t is the calendar year.

4.2 High school completion and university enrollment

Thanks to a rich and original administrative data archive to which we gained access, we managed to link the Invalsi NEPSA archives for 10^{th} grade students in the school years 2011-12 to 2017-18 to the National Students' Registries. The National Students' Registries are administrative archives managed by the statistical offices of the Ministry of Education and the Ministry of University, and covering all administrative information on students enrolled, respectively, in any Italian high school or university, on a census basis.[22]

We merged the individual-level records in the Invalsi NEPSA archive of grade 10 to information on the high school completion and on the mark gained at the high school diploma in grade 13 (i.e., the high school GPA, as contained in the National Students' Registry held by the Ministry of Education). Then, we further track students who decided to enroll at any (public or private) university in Italy (as recorded in the National Students' Registry held by the Ministry of University) and, for those who enroll, also calculate the probability of dropout in the freshmen year.[23] To allow for comparability across cohorts of high school graduates, we focus on students who enroll at university in the two academic years following their high school graduation.[24] Overall, we are able to track in the National Students' Registries 87 percent of the students observed in the Invalsi NEPSA archive containing the statements on aspirations in grade 10 (s.y. 2011-12 to 2017-18).

In our empirical analysis of post-grade 10 educational investments—following the aspirations expressed in grade 10—we thus focus on four main outcomes: the probability of completing high school (*High school completion*), the final grade at high school (*High school GPA*), the probability of enrolling at university (*University enrollment*), and the probability of dropping out during the first year of university (*University dropout*).[25]

We perform our empirical analysis on aspirations formation on the census of 10^{th} grade students from the eight cohorts of the school years from 2010-11 to 2017-18 (about 2,850,000 individuals), as derived from the NEPSA archives. Then, when we focus on the effects of aspirations on subsequent human capital investments, we will make use of

[22] We cannot merge the first cohort of students who attended grade 10 in the school year 2010-11 because the longitudinal student identifier, which is necessary to perform such a link, is not available in the Invalsi NEPSA archives in that school year. In a later section, we will test the robustness of our main findings to alterations of the baseline sample, e.g. the exclusion of the first cohort.

[23] Dropout probability in the first year of the university is considered a good proxy of the academic success (Adamopoulou and Tanzi, 2017). Notably, it also allows for comparability across years and majors.

[24] On average, in the ten years between the academic years 2011-12 and 2021-22, about 75 percent of those who enroll at university for the first time did it exactly in the two academic years following high school graduation (ANVUR, 2023).

[25] Notice that each variable is defined on a different consistent sample. Namely: the probability of high school completion is defined on the full subsample of the tenth grade students in the NEPSA-National Students' Registries matched data; the high school GPA and the probability of university enrollment are defined only for those who completed high school; university dropout is defined for those who enrolled at university.

the matched data NEPSA-National Students' Registries. In doing so, we are forced to use a subsample of the NEPSA archives (about 1.800.000 individuals) because the first cohort of tenth grade students (school year 2010-11) cannot be matched to the National Students' Registries. To the best of our knowledge, this is the first time that students' aspirations appear in such a large administrative census data source and with such a large cohort coverage, and that such a large administrative census data on students' aspirations is mapped to relevant subsequent educational investments.

4.3 Descriptive evidence

In Table 1 we report the descriptive statistics of the variables used in the analysis. As an indirect way to check the consistency of the stated aspirations, Figure 1 tabulates AT according to some salient individual and family characteristics.

[Table 1 and Figure 1 about here]

On average, about 65 percent of the students desire to achieve a university education (*Aspiration Tertiary*). Aspirations to achieve tertiary education display a high variability within each subgroup: females' and natives' aspirations are, respectively, 17 and 11 percentage points (p.p.) higher as compared to male and non-native peers; similarly, students from more affluent families display aspirations 25 p.p. higher. Not surprisingly, while 89 percent of the students in the academic track aspire to achieve a college education, this figure drops by almost a half (39 percent) for students in non-academic tracks.

[Figure 2 about here]

In order to visually capture the nature of the raw correlations under study, Figure 2, panel (A), shows a bins scatter-plot of *Aspiration Tertiary* on the share of school peers with at least one unemployed parent (on the horizontal axis, UP in eq. 2, i.e. our proxy of the business cycle variations as perceived from each student's aspiration window). The raw data display a negative and statistically significant correlation between the two measures, i.e., exposure to an increasing share of peers with at least one unemployed parent is associated with lower educational aspirations.

Concerning the subsequent educational outcomes, based on data from the National Students' Registries, approximately 90 percent of students completed high school, achieving an average high school GPA of 80 out of a maximum of 101 (see Table 1). Around 65 percent enrolled in university within two academic years after graduating from high school. Among those who enrolled, roughly 6.5 percent dropped out without successfully completing their first year.

Figure 2, panels (B) to (E), shows the bins scatter-plots of each subsequent educational investment on UP. The raw data display negative and statistically significant correlation

between exposure to peers with unemployed parents an the probability of high school completion, the high school GPA, and the probability of college enrollment, while a positive correlation with university dropout. While Figure 2 only depicts raw correlations, in the following paragraph, we will describe in depth the empirical setup that we exploit in order to pin down the proper casual estimates.

5 Identification strategy

5.1 Baseline estimating equations

Aspirations formation. Following the seminal paper by Hoxby (2000) and a well-established empirical literature, we exploit the (arguably) as-good-as-random within school and across cohorts variation in the share of school peers with at least one unemployed parent. We thus estimate the following baseline equation:

$$AT_{isct} = \alpha_1 + \beta_1 UP_{sct}^{(-i)} + \gamma_1 X_{isct} + \theta_1 S_{sct} + \lambda_s + \lambda_c + \lambda_{st} + \epsilon_{isct} \tag{3}$$

where: AT_{isct} is the aspiration for tertiary education stated in calendar year t by student i of cohort c in school s (as defined in eq. 1); $UP_{sct}^{(-i)}$ is the share of school peers with at least one unemployed parent (as defined in eq. 2). In our setting, school peers and their families constitute the aspiration window through which students may perceive changes in the business cycle (see Section 3); X_{isct} is a vector of student-level characteristics (including dummies for: student gender, first and second generation non-native status, grade retention, parents' tertiary education, own parents' unemployment status; student's achievement in the previous semester); S_{sct} is a vector of class- and school-level time-varying characteristics (such as: the shares of females, first and second generation non-natives, grade retained, class size, school size, cohort size).[26] λ_s, λ_c, and λ_{st} represent, respectively, school and cohort fixed effects (FE), and school-specific time trends.

The estimation of equation 3 allows us to shed new light on the process of aspiration formation, and in particular on how changes in students' perceptions of the business cycle influence the development of their educational aspirations. Building on the conceptual framework proposed by Genicot and Ray (2017), we expect that experiencing a recession within one's aspiration window reduces educational aspirations, with the effect being stronger the narrower the aspiration window considered (see testable implication (i) in Section 3).

Aspirations and investments. In Section 6.2 we will focus on the effects of aspirations on subsequent educational investments. We proceed in a reduced-form setting

[26] See Table 1 for the complete list of the control variables. As for the cohort size, we follow Epple and Romano (2011) and add up to a third-degree polynomial, as peer composition may potentially be correlated with cohort size.

and estimate:

$$Y_{iscT} = \alpha_2 + \beta_2 UP_{sct}^{(-i)} + \gamma_2 X_{isct} + \theta_2 S_{sct} + \psi_2 UR_{rT} + \lambda_s + \lambda_c + \lambda_{st} + \epsilon_{iscT} \quad (4)$$

which closely follows eq. 3 with two main differences. First, the outcome variables (Y_{iscT}) are the educational investments observed at least three years later the statement of the educational aspirations (at time T).[27] Second, following an established literature which links the educational choices with the contextual conditions of the business cycle (von Wachter, 2020), we include a control (UR_{rT}) for the unemployment rate observed in the region where the school is located (r) at the time of the educational choices (T).

The estimation of equation 4 provides insights into how changes in students' aspirations translate into subsequent educational investments. Guided by the framework in Genicot and Ray (2017), we additionally look for potential non-monotonic effects. Namely, a decline in aspirations (as estimated from equation 3) may lead to lower, higher, or no changes in educational investments, depending on the student's position relative to the threshold that separates the frustration and satisfaction regions (see Section 3 and Appendix Figure A3; testable implication (*ii*)).

It is important to note that the estimates presented here reflect the relationship between aspirations and subsequent investments in a reduced-form framework, where variations in aspirations are first identified in equation 3. While this approach offers greater flexibility in estimating both overall and heterogeneous effects, we also provide a direct estimate of the effect of aspirations on educational investments in a later section, using a 2SLS strategy (see Section 9).

5.2 Identification assumptions

In equations 3 and 4, the parameters of interest (β_1 and β_2) are identified thanks to the (arguably) exogenous variation in the share of peers with unemployed parents across cohorts within school. School fixed effects control for time-invariant endogenous sorting into schools, while cohort fixed effects take into account year-to-year unobserved differences across cohorts. School and cohort fixed effects thus solve the identification issues related to time-invariant students' sorting into schools, while the strategy fails to control for school-specific time trends that may alter both peer composition and the outcomes of interest (Lavy and Schlosser, 2011). We thus include in all specifications school-specific (linear, quadratic or cubic) time trends (λ_{st}), which account for both time variant and school specific unobserved factors correlated with both variations in exposure to peers with unemployed parents and the educational outcomes of students in the same school.[28]

[27] Specifically, high school completion, high school GPA, and college enrollment are measured three years later (at $T = t + 3$), while college dropout is measured four years later (at $T = t + 4$).

[28] We intend for time trend the calendar year when each school year starts, i.e. from 2010 (or 2011 depending on the outcomes) to 2017.

The extensive set of control variables included allows us take into account observable time variant factors.

For the estimation of the effects on educational outcomes, we also control for the regional unemployment rate registered during the year of high school completion (effective for those who completed high school and potential for those who drop out) in order to rule out any possible short-run effect due to the business cycle.

In what follows, we will present an extensive set of evidence corroborating our main identifying assumption, i.e., that after controlling for the set of control variables, fixed effects and trends, the remaining variation in the variable $UP_{sct}^{(-i)}$ can be considered as good as random. On top of that, additional robustness and sensitivity checks, as well as alternative specifications will be discussed at length in Section 7.

Evidence corroborating the identification assumptions. A first-order concern before delving into the validity of our empirical strategy is whether we have sufficient variation in the share of peers with unemployed parents once we remove school and cohort fixed effects (Lavy and Schlosser, 2011). In Appendix Table A1 we show that once we add school and cohort fixed effects, and school-specific (linear) time trends, we are still left with about 60 percent of unexplained residual variability, in line with existing studies exploiting a similar empirical variability and identification strategy (Olivetti et al., 2018; Mertz et al., 2025; Liu et al., 2016). We can now test some main implications of the identification assumption recalled above (Lavy and Schlosser, 2011; Brenøe and Zölitz, 2020; Merlino et al., 2019).

First, as a sort of balancing test, we can verify if variations in the proportion of students with an unemployed parent within a school is associated with observable individual-level characteristics. In Appendix Table A2 we show the results of several regressions in which each pre-determined student characteristic is regressed on UP, after controlling for school and cohort fixed effects, and school-specific linear trends. As a matter of fact, we do not detect any systematic correlation: a few coefficients are statistically significant, though not in a systematic way across the specifications tested; moreover, all estimates are extremely close to zero.[29]

Second, we can graphically inspect the nature of the within cohort-to-cohort variation exploited for identification purposes. In the spirit of Brenøe and Zölitz (2020) and Mertz et al. (2025), Appendix Figure A5 plots the share of peers with unemployed parents (after removing school and cohort fixed effects). The assumption that variation in our exposure measure is as good as random (once we condition on school and cohort fixed effects) is supported by these deviations in the share of peers with unemployed parents, which mimic a normal distribution. Appendix Figure A4, instead, plots UP for a random sample of 100 schools by school year (as in Carrell et al. (2018)). The random component of the

[29] Appendix Table A3 replicates, with comparable results, the same exercise on the sub-samples of the students who finished high school and on those who enrolled at university.

variability is quite apparent in this graph. It can be also noticed some increase in the UP variable in the central years used in the analysis, when Italy reached its peaks of unemployment rate (see for e.g. Appendix Figure A1). This further corroborates the use of the UP variable as a good proxy for the actual unemployment rate.

Third, the identifying assumption would be violated if, for example, students with unemployed parents self select into some specific schools based on some expectation of higher or lower proportions of peers sharing the same characteristic. In Appendix Table A4 we thus show the results of simple OLS regressions of own status of student with unemployed parent on the share of peers (excluding the student) with unemployed parents (i.e., our measure UP). However, as first noticed by Guryan et al. (2009), the simple correlation between each student status of having an unemployed parent with the share of school-cohort peers with unemployed parents would mechanically deliver a spurious negative correlation, as each student peer group necessarily excludes the student itself (column 1 of Appendix Table A4). We thus follow the correction procedure proposed by Guryan et al. (2009) and include in the regression the school-level leave-out mean of the proportion of peers with unemployed parents across cohorts within the school to account for the mechanical relationship between own status and peers' status. As expected, the negative estimated relationship turns to a positive one once we account for this spurious correlation (Appendix Table A4, columns 2-3), and it remains precisely estimated around zero in all remaining specifications. We finally notice that our estimates of this relationship return correlations which are, albeit significant in statistical terms, extremely small in magnitude and very precisely estimated around zero. Given the large sample size that we use, covering the universe of eight cohorts of tenth grade students in Italy, we can be confident that these relations are indeed negligible in magnitude and not economically meaningful.

6 Results

6.1 Aspirations formation

We estimate equation 3 using OLS regressions, with robust standard errors clustered at the school level. In Table 2 we present the main results for AT, where we progressively saturate the model by adding the FE, the control variables, and the linear, quadratic, or cubic school-specific trends.[30]

[Table 2]

[30]For all outcome variables, Appendix Table A5 provides the parameter estimates of the full list of control variables. The definition of all the control variables can be found in Table 1. Importantly, all the regressions include the dummy for student's own parent unemployment status.

The coefficient estimates for Aspiration Tertiary appear quite stable and always statistically significant across the various specifications. Concerning the magnitude of the estimated effects, we should notice that it decreases as long as we progressively saturate the model, while the functional form of the school-specific trend does not alter substantially the point estimates. In what follows, we will therefore concentrate our comments on the specification in column 4, which makes use of linear trends, and which we will consider as our baseline.

We uncover a negative effect of the exposure to peers with unemployed parents on students' aspirations for tertiary education, thus confirming the theoretical predictions that the effects of an economic recession observed within one's cognitive window lower own aspirations (testable prediction (i), see Section 3). Concerning the magnitude of the effect, a 1 p.p. increase in exposure is associated with a decrease of 0.05 p.p. in aspirations for tertiary education (approximately 1/10 of SD). Assuming linearity in the main effects, our estimates imply that students enrolled in cohorts with relatively high exposure (at the 75^{th} percentile of the exposure distribution) are about 14 percent less likely to aspire for a tertiary education title than students enrolled in cohorts with relatively low exposure (at the 25^{th} percentile).[31]

In terms of magnitude, the effect also appears to be economically meaningful. Indeed, in our regression results, the coefficient is similar to the effect of being female, which is considered a strong determinant of higher educational aspirations (Lundberg (2020); Favara (2017), see Appendix Table A5). The estimated effect is smaller than that documented by Rizzica (2020), who finds that students' aspirations for tertiary education increased by 4.8 percentage points following exposure to a policy explicitly designed to foster educational aspirations. It is, however, reasonable to expect the effect of a targeted policy to be larger than the one estimated in our context, which operates through peer interactions. The magnitude of our effect is indeed very close to those reported in the literature when comparing our estimates with two relevant studies examining the influence of peers' parental characteristics on labor market and human capital decisions, namely Mertz et al. (2025) and Cattan et al. (2025).[32]

6.2 Aspirations and investments

In this section, we explore - in a reduced form setting - the effects of aspirations on the subsequent educational investments, considering the four main measures previously

[31] In our data the IQR of UP is of about 4 p.p., from 0.029 to 0.069. The effect is here expressed in percent terms with respect to the mean of the dependent variable (Mertz et al., 2025).

[32] Mertz et al. (2025) find that increasing by 1 p.p. the exposure to school peers' whose parents are entrepreneurs increases by less than 0.01 p.p. the probability that the student became an entrepreneur by the age of 40. Cattan et al. (2025) document that an increase of 1 p.p. in the share of school peers whose parents have an elite education increases by 0.03 p.p the probability that a student enrolls in an tertiary education elite program.

introduced (see Section 4.2). Table 3 presents the baseline results. As in the analysis on students' aspirations formation, we estimate eq. 4 using OLS regressions, with robust standard errors clustered at the school level, and consider as baseline the specification which includes all FE, control variables, and linear school-specific trends (col. 4).

[Table 3]

We uncover detrimental effects of exposure to higher shares of school peers with unemployed parents in grade 10 on the subsequent educational outcomes, in line with the idea that – on average – lower aspirations translate into lower effort. More in detail, we find that the effects on the probability of completing secondary education (Panel A) are negative, but noisily estimated in the whole population of students. We also observe a decreasing effect on high school GPA, by about 2 points (corresponding to a decrease of 2.5 percent with respect to the average high school GPA in the sample; Panel B). The effect on the probability of university enrollment (Panel C) is again negative and statistically significant. In this case, an increase of 1 p.p. in the share of peers with unemployed parents would lead to a decrease of university enrollment of about 0.05 p.p. (approximately 1/10 of a SD). Finally, we uncover that higher exposure to negative business cycle in the moment of aspiration formations also translates into an increased probability of dropping out of college in the first academic year (about 0.03 p.p., about 0.15 SD). All the estimated effects appear economically meaningful: they are about 2 times larger than the effect of being female in our regressions (see Appendix Table A5).

Our results on the whole sample of students point to aspirations as, on average, a motivating factor for individuals, in that they are set to a high enough but reachable level.[33] Given that the effect might also depend on the aspiration gap which characterizes each student, in the heterogeneity analysis we will look specifically at whether clusters of students with plausibly different gaps tend to be affected in different ways.

7 Sensitivity and robustness checks

We check the robustness of our results under two main dimensions. First, we provide a battery of sensitivity checks devoted to some possible variants of our baseline specification, mainly concerning the control variables or the samples used. Second, we test for the possible effects induced by measurement error in our main variable of interest.

7.1 Specification checks

Consistency of the results on aspirations across samples. As explained in Section 4, the estimations on subsequent educational outcomes are performed on a slightly

[33] In other words, the average negative relation estimated would be consistent with a shift to the left in the satisfaction area of the Appendix Figure A3.

smaller sample with respect to the one for the results on aspirations formation. The difference in the sample size comes from two main reasons. First, with the linkage to the National Students' Registries we loose the first cohort of students (i.e., school year 2010-11). Second, we cannot merge about 13 percent of students because of errors in the individual-level anonymous identifier (either in the Invalsi NEPSA or in the National Registries).[34] As a check of consistency, we repeat the estimations on the aspiration tertiary (Subsection 6.1) on the same smaller sample used for the estimates on the subsequent educational outcomes (Subsection 6.2). The results are reported in Appendix Table A6 and are in line with the baseline reported in Table 2.

Winsorized sample. We repeat our estimates on a sample in which the main variable of interest (UP) is winsorized at the first and ninety-ninth percentiles.[35] In so doing, we check that our estimates are not driven by some extreme values in the distribution of the variable UP. The results reported in Appendix Table A7 (col. 1) are not significantly different from our baseline.

Students' achievement measures. An important control variable in our empirical specification is the achievement level measured in the semester before the statement of the aspirations. Indeed, Lekfuangfu and Odermatt (2022) show that achievement is a strong correlate of students' aspirations, so that we arguably would like to clean out our estimated effect from this possible omitted variable by including a good proxy for the students' competences.

In our baseline specification we use the average grade given by teachers in the two main subjects, i.e., Italian language and math, at the end of the first semester of grade 10. Importantly, this measure embeds two desirable elements: first, it reflects a predetermined level of achievement with respect to the moment when aspirations are stated; second, it is sufficiently close in time to the moment of the aspiration statement.[36] However, two caveats are in order. First, in the spirit of keeping as many observations as possible, when only one grade was available in the data (either the Italian language or the math one), we simply take that one and add a dummy variable which indicates the students for whom we only have one of the two grades (0.3 percent of observations in the sample).[37] Second, we also add an ordinal achievement measure, namely the percentile rank of the students in her class, to account for relative differences in students' perceived ability with respect to her own peers (Murphy and Weinhardt, 2020; Pagani et al., 2021).[38]

[34]The two datasets used are completely anonymized and independent so that we cannot recover which observations in the Invalsi NEPSA data are not matched to the school registries. However, a comparison of the key summary statistics across the two datasets (Table 1) shows that the subpopulation with matched educational outcomes closely mirrors the characteristics of the full sample.

[35]Experimentation with trimmed samples or different percentiles for winsorization do not show remarkable differences.

[36]Teachers' grade at the end of the first semester are given to the students usually by the month of January, while aspirations are stated in the following months of April to early May.

[37]Our results are largely unaffected when excluding these individuals.

[38]This is particularly important in our context given that teachers' grades are not standardized assess-

As a sensitivity check, we use the Invalsi NEPSA standardized test scores in grade 10 (as opposed to teachers' grade) as an alternative measure of students' achievement available in the data. The advantage in making use of tests scores lies mainly in their standardized nature, while the drawback is that they are contemporaneous to the statement of the aspirations. As for the measure based on teachers' grades, we take the average score in the tests for Italian language and math, and, when one of the two is lacking, we simply take the available one and add a dummy variable to control for this. The results reported in column 2 of Appendix Table A7 are in line with our baselines.

Year of birth fixed effects. In our baseline specification we control for cohort fixed effects and dummies for the student being grade retained, which taken together implicitly control for the student belonging to the birth cohort of those who had a regular progression across grades or for belonging to other birth cohorts. Alternatively, we could also add cohort of birth fixed effects, as in our sample of eight subsequent school years we observe 13 different birth cohorts. The results reported in column 3 of Appendix Table A7 do not significantly detach from the baseline.

Family wealth. The period under examination is characterized not only by a substantial increase in the unemployment rate but also by a pronounced decline in average household income and wealth.[39] Such a contraction in wealth could also have exerted a discouraging effect on students' educational aspirations and outcomes. While precise household-level wealth data are unavailable, we account for this limitation by including in all the specifications as a proxy for family wealth the parents' educational level, both for each student and for her school peers. In this check, we further augment the baseline specification by including two additional proxy measures: first, the average regional household income from EU-SILC data for Italy; second, a quality indicator of home resources at the student level based on the availability of a quiet study space, a computer, a desk, an internet connection, a private room, and reference materials like encyclopedias. These and other items are generally used in education surveys to obtain a measure of the student's family socio-economic and cultural status (ESCS indicator).[40] We thus test the sensitivity of our results to the inclusion of an indicator of high family possessions, both at the student, class and school level. In doing so, we not only clean out our results from possible omitted variable bias at the individual level linked to the components of family wealth not already captured by parents' education, but also we control for the

ments, and thus they might also reflect both teachers' personal evaluations (also with reference to the other class peers), and students' non-observable traits (like diligence, class behavior, general attitude, etc.).

[39]See for e.g.: EU-SILC estimates for Italy (https://www.istat.it/wp-content/uploads/2024/10/INCOME-AND-LIVING-CONDITIONS-2023.pdf, accessed on February, 4 2026).

[40]Notably questions on the possession of these items have been chosen to be included in the INVALSI NEPSA *Students' Questionnaire* as they can be safely considered as pre-determined with respect to any student's outcome surveyed, and to follow pre-existing international best practices in the OECD PISA and IEA TIMSS surveys (Campodifiori et al., 2010).

average time-variant family wealth in each school and classroom. The estimates reported in columns 6 and 7 of the Appendix Table A7 remain largely consistent with the baseline.

7.2 Measurement error

A peculiar case of measurement error (ME, henceforth) might arise in the case of estimation of peer effects. It derives from the simultaneous inclusion of both own and peers' average characteristic (i.e., the parent unemployment status in our case) in the estimated model, when these variables are measured with some error. Previous literature has shown that this peculiar type of ME would lead to attenuation bias in the estimated peer effects coefficient in case the variability exploited can be considered as good as random, while it would lead to overestimation of the peer effects parameter in case of non-random assignment (Angrist, 2014; Feld and Zölitz, 2017).

In line with the existing literature, we provide two tests for the plausible effects of ME in our estimates. One possible way is to add in the regression variables which may be correlated with the ME and observe the changes in the estimated coefficient. We thus augment our baseline equations with a measure of unemployment rate at the regional and Local Labor Market (LLM) levels.[41] These are measured in the four quarters preceding the students' stating of aspirations (i.e., reasonably when the unemployment status of the parent disclosed in the Invalsi data is referred to) from the Labor Force Survey provided by the Italian Bureau of Statistics (Istat). Results reported in in columns 4 and 5 of Appendix Table A7 are very similar to our baselines.

As a further robustness check, following Merlino et al. (2019) and Feld and Zölitz (2017), we gradually introduce measurement error into our explanatory variable of interest and analyze whether the relative estimated coefficient tends to zero as evidence of as-good-as-random variation and that any potential ME would possibly downward bias our results rather than exacerbate them. We thus generate a dummy variable equal to one with probability equal to the predicted share of peers with unemployed parents estimated by a regression on unemployment status of parents, year and school FE. Then, a new share of peers with unemployed parents is generated, which is equal to the observed one with a probability of 99 percent and to a random value with a 1 percent chance. This step is repeated for different levels of error. Aspirations and the other outcomes are eventually regressed on the new generated share of peers with unemployed parents measured with different levels of error. The entire process is estimated 1000 times. Appendix Figure A6 shows that the average coefficients of all dependent variables tend to zero as more ME is introduced in the explanatory variable of interest. This corroborates the hypothesis that the variability we are exploiting is as good as random and that, if anything, we are not

[41] In Italy there are 20 regions (NUTS 2) and about 600 LLMs.

overestimating the peer effects.

8 Heterogeneous effects and alternative channels

Building on the theoretical framework, and leveraging the richness of our dataset, which covers a large population of students and includes detailed information on individual and family characteristics, we explore several dimensions of heterogeneity in the formation of aspirations and subsequent educational investments.

Regarding aspirations formation, we first examine how the baseline effects vary when considering different proxies for students' relevant aspiration windows. In line with the theoretical model, wider aspiration windows, such as those associated with less socially connected individuals, are expected to lead to more muted responses to changes in the economic environment.

Second, we consider alternative channels that might contribute to explaining our findings on aspirations. Specifically, we test whether students' responses vary depending on the educational attainment of the unemployed parent. If the observed effects were primarily driven by a perceived reduction in the returns to education, we would expect stronger effects when the unemployed parent is highly educated, rather than when they have low levels of education. Finally, motivated by the literature on role models, we explore the existence of gender-specific patterns in the effects.

Turning to aspirations and subsequent educational investments, the theoretical model also suggests that heterogeneity may depend on students' initial status, which implicitly determines how large the aspiration gap could be. In particular, we examine whether effects differ by socio-economic background, which we interpret as a proxy for the initial size of the aspiration gap, i.e. students from more disadvantaged backgrounds are likely starting out with a larger gap between their current situation and their aspirations.

8.1 Aspirations formation

Aspiration window. We hereby focus our attention on different definitions of the aspiration window and estimate the resulting effects on the individual's aspirations. We provide a narrower definition, i.e. based on the calculation of our measure $UP_{sct}^{(-i)}$ (eq. 2) on class rather than school peers, and a wider definition, i.e. based on the unemployment rate in the Local Labor Market (LLM) where the high school is located.[42] The results are in Table 4, which also reports in column 1 the baseline estimates from Table 2.

[Table 4]

[42]Italian LLM are about 600, a smaller geographical entity as compared to the provinces (NUTS level 3), which broadly correspond to school districts.

The overall pattern is in line with the predictions of the theoretical framework outlined in Section 3, whereby definitions of larger aspiration window tend to deliver smaller effects, while narrower definitions deliver stronger effects. In our case it seems that estimations based on class rather school peers do not make a substantial difference on the effect, while the effects estimated using the local labor market conditions are sensibly smaller, in line with the results in Lekfuangfu and Odermatt (2022).

Alternative channels. In what follows, we test some alternative explanations which might concur to explain our main empirical findings. Specifically, we have in mind two main channels. First, one may argue that educational aspirations (and then investments) may decrease because during a recession students revise downwards their *expected* returns to education (Morgan, 1998). If this were the case, we might posit that the effect should be driven by the status of peers' parents with higher education (relative to that of those without). Second, we may shape the aspiration window so as to also include insights from the theories of *role models* and test them empirically. In particular, following existing literature (Beaman et al., 2012; Olivetti et al., 2018), we may suppose that girls are more impressed by what happens to mothers of peers and boys by what happens to fathers.

[Table 5]

In Table 5 we explore whether changes in the expected returns to higher education affect aspirations. We thus frame the students' aspiration window so as to consider possible heterogeneous effects by distinguishing peers' unemployed parents by their level of education, as derived from the NEPSA school records. Panel A distinguishes between peers' parents with at least the high school diploma and those without; Panel B uses a different specification by distinguishing between peers' parents with tertiary education and those without. Independently from how we specify peers' parents with lower/higher education titles, and independently from how we include these variables in two different or one single regression (i.e., specifications in col. 1 and 2 vs. specification in col. 3), the results are consistent with the effects mostly coming from the observation of the unemployment status of lower educated peers' parents.[43] This finding is suggestive that the underlying mechanism is not about a change in the expected returns to higher education, but rather a general lowering of aspirations.

[Table 6]

A final important dimension of heterogeneity concerns gender. Recent research has identified aspirations as a potential driver of well-documented gender differences not only in academic performance and educational choices (Lundberg, 2020), but also in career trajectories, occupational patterns, and marital decisions (Inoue-Smith, 2014). In our

[43] We repeated this analysis focusing also on subsequent investments and it delivers very similar results.

setting, while female students tend to report higher aspirations for tertiary education, they do not appear to be more affected than male students by increased exposure to adverse business cycle conditions (Table 6, Panel A). However, it is plausible that male and female students respond differently depending on whether the unemployment shock affects peers' mothers or fathers.

To explore this possibility, we refine the definition of the aspiration window to distinguish between the employment status of peers' mothers and that of peers' fathers, and we estimate the effects separately for female and male students. The results presented in Table 6 (Panels B and C) indicate that male and female students are similarly influenced by the unemployment status of both their peers' mothers and fathers. Overall, in our setting we find no evidence supporting the presence of gender role mechanisms in shaping students' aspirations.

8.2 Aspirations and non-monotonic effects in investments

A key component of the aspirations theory developed by Genicot and Ray (2017) is the notion of *frustration*. Aspirations must be sufficiently ambitious to encourage individuals to exert effort and invest in their future, yet not so high as to become unattainable and ultimately demotivating. In our context, this implies that changes in aspirations may have non-monotonic effects on subsequent educational investments, as discussed in Section 3. While our analysis of the full sample shows that adverse business cycle conditions tend to reduce educational investments on average, we now investigate whether the non-monotonic relationship predicted by the theory may hold for specific subgroups of individuals.

To this end, we distinguish individuals based on the size of their aspiration gap, which is the distance between their current status and the aspirational target. This gap varies depending on the initial conditions individuals face, which we proxy using predetermined family characteristics that reflect their socioeconomic background. Specifically, we differentiate students by parental education (as previously discussed), by the occupational status of the father (blue-collar vs. white-collar jobs), and by the quality of home resources, such as access to a quiet study space, a computer, a desk, internet connection, a private room, and reference materials like encyclopedias. Since aspirations are uniformly defined as the pursuit of tertiary education, students from more disadvantaged backgrounds are likely to be further from this goal, and thus may experience a larger aspiration gap.

[Table 7]

The results of this heterogeneity analysis are presented in Table 7. We find evidence that students from more advantaged family backgrounds are negatively affected by an

increased perception of adverse business cycle conditions, whereas those from less privileged backgrounds appear less affected, or not affected at all. This finding aligns with testable implication *(ii)* of the theory. Specifically, the larger the aspiration gap, as is likely the case for students from poorer families, the greater the likelihood that a negative shock to aspirations does not lead to a reduction in future educational investments. This is because these students are more likely to fall within the *frustration area* (see Appendix Figure A3), where a decline in aspirations does not necessarily translate into lower effort or investment. In contrast, students from more affluent families, who plausibly face a smaller aspiration gap, are more likely to be in the *satisfaction area*, where aspirations are both high and attainable. For them, a negative external shock that lowers aspirations is more likely to result in a corresponding decline in educational investments.

9 Isolating the effect of aspirations on education

The empirical analysis conducted so far has established a negative relationship between exposure to school peers with unemployed parents and both students' educational aspirations (Section 6.1) and their subsequent educational outcomes (Section 6.2), including high school GPA, university enrollment decisions, and university dropout rates.

We have shown that observing peers whose parents are unemployed tends to depress students' educational aspirations. This result is consistent with the conceptual framework outlined in Section 3. Specifically, when the business cycle deteriorates, the distribution of salient aggregate variables, such as wealth and income, shifts leftward. This shift leads to a reduction in individuals' aspirations regarding those same outcomes, and ultimately weakens their incentives to invest in achieving them. In our framework, the relevant investment is in education.

In this section, we take a final step and aim to isolate the direct causal effect of aspirations, as influenced by business cycle conditions, on educational outcomes. To do so, we reinterpret equations 3 and 4 as the first-stage and reduced-form equations, respectively, of a two-stage least squares (2SLS) regression framework. In this setting, we estimate the causal effect of aspirations on future educational investments using the share of school peers with unemployed parents at time t ($UP_{sct}^{(-i)}$) as an instrument for AT_{isct}:

$$Y_{iscT} = \alpha_3 + \beta_3 AT_{isct} + \gamma_3 X_{isct} + \theta_3 S_{sct} + \psi_3 UR_{rT} + \lambda_s + \lambda_c + \lambda_{st} + \epsilon_{iscT} \tag{5}$$

To assess the validity of the exclusion restriction, we first note that the instrumental variable exploits idiosyncratic within-school, across-cohort variation in the share of peers with unemployed parents, which is the same source of variation underlying the reduced-form estimates. Equation 5, moreover, includes the same set of controls and fixed effects as equation 4, thereby accounting for observed and unobserved confounders, including a

measure of students' *pre-treatment* academic performance.

Identification requires that variation in exposure to peers with unemployed parents affects subsequent educational outcomes exclusively through its impact on students' aspirations. One might argue that a more deprived class environment at time t could influence educational choices at time T through alternative channels, such as a deterioration in academic performance from t onward driven by factors unrelated to aspirations – for instance, differences in the number or quality of extracurricular activities in which the class participates (e.g., end-of-year school trips). However, such activities are typically determined at the school level as part of the annual educational plan and are usually subsidized for economically disadvantaged households. Consequently, marginal changes in the economic composition of a class are unlikely to generate meaningful variation along this dimension.

Finally, a direct effect of the instrument on educational outcomes is unlikely by construction in our setting, due to the timing of both exposure and decisions. Exposure to peers with unemployed parents affects students' aspirations at time t, while the educational outcomes we analyze are realized only three to four years later, at time T. During this interval, students are no longer exposed to the same peer group composition in terms of parental unemployment, and the relevant educational choices are taken *after* aspirations have already adjusted. As a result, any direct channel linking peers' parental unemployment at time t to educational outcomes at time T – other than through aspirations – would require persistent effects operating independently of students' subsequent educational trajectories. Such channels are unlikely, particularly conditional on the inclusion of pre-treatment academic performance and the full set of controls, fixed effects and school-specific trends in equation 5. This temporal separation therefore strengthens the credibility of the exclusion restriction by limiting the scope for contemporaneous peer effects or other direct influences of the instrument on later educational outcomes.

[Table 8]

The instrumental variable (IV) results in Table 8 (col. 3) show a strong positive effect of student's aspiration for tertiary education on the subsequent educational outcomes. In particular, aspiring for tertiary education increases by about 26 points the high school GPA, it increases by about 70 p.p. the probability of effectively enrolling at university, and it decreases by about 61 p.p. the probability of dropping out from university. While the the F-statistics confirm that the estimates are sufficiently robust, we notice that the effects are larger as compared to the endogenous OLS (col. 2).

We acknowledge two main reasons that may explain this result in our setting. First, the IV approach may correct for omitted variable bias present in the (endogenous) OLS regression, particularly if such omitted factors are negatively correlated with aspirations for tertiary education. Second, under certain conditions (Blandhol et al., 2025), IV es-

timates capture the causal effect for the subpopulation of *compliers*.[44] In our context, compliers are those students who are sufficiently on the margin of deciding whether or not to aspire to college, such that a salient worsening of the business cycle is enough to discourage them. For the rest of the population, aspirations may remain unaffected, either because they fall within the frustration zone, or because they are already sufficiently close to the aspirational target. It is therefore not surprising that the IV estimates are substantially larger than the OLS ones.

These findings provide important new evidence by offering a causal estimate of the effect of aspirations on various educational outcomes in the medium term. To the best of our knowledge, only Rizzica (2020) estimates the causal effect of increasing students' aspiration for college enrollment by exploiting a policy initiative in the UK, and finding significant impacts only for students from sufficiently well-off families. Other existing works, on the other hand, essentially provide robust residual correlational evidence on this relation (Favara, 2017; Ross, 2019; Guyon and Huillery, 2020).

10 Concluding remarks

Recent literature has proved educational aspirations to be an important determinant of individuals' subsequent educational choices and investments in human capital, in such a way that even aggregate measures – such as country inequality and poverty – are linked to them (Genicot and Ray, 2017; La Ferrara, 2019). It is thus of paramount relevance to investigate the determinants that influence them and how this eventually influences human capital accumulation (Fruttero et al., 2024).

In this paper we study how changes in peers' economic conditions during a recession affect both adolescents' contemporaneous educational aspirations and their later educational choices and outcomes. To the extent that aspirations are formed and modified on the basis of the experience of people in ones' aspiration window – i.e., their peers – we expect adolescents to review their aspired level of education under the influence of changes in the socio-economic status of their school-mates.

Policy-wise, focusing on the youngest is especially important as their aspirations (and subsequent choices) are more malleable by targeted policies. Moreover, choices taken in some important life's turning points – as in the case here of the end of compulsory schooling – might have long-lasting consequences, so that their correction from external distortions might generate especially high benefits. Finally, the focus on peers' characteristics as a potential determinant of educational aspirations is particularly important

[44] We follow the recent developments in this literature and perform, as suggested by Blandhol et al. (2025), the RESET test (Ramsey, 1969) for each of our 2SLS specifications. The test never rejects the null that the specification is rich in covariates (with p-values: 0.9249 for high school completion, 0.5544 for high school GPA, 0.9842 for university enrollment, 0.4095 for university dropout), thus providing supporting evidence that in our context the IV estimand is (at least weakly) causal.

in the view of possibly breaking the negative vicious path which connects the incidence of belonging to a more disadvantaged group to having lower aspirations, hence investing less (in education here), hence remaining in a low socio-economic status in the future – i.e., breaking aspiration-induced poverty traps (Ray, 2006; Dalton et al., 2016).

Our analysis looks at how exogenous variations in exposure to peers with unemployed parents affects students' aspirations formation and subsequent educational outcomes. We look at aspirations for starting tertiary education as increasing tertiary education has been widely recognized as one of the key drivers for sustainable long-run well-being: tertiary education is instrumental in reducing poverty and increasing widespread prosperity (OECD, 2018). Moreover, we also map the subsequent educational choices, such as completing high school, the high school GPA, and the actual enrollment at university and the dropout from university. Identification is achieved by exploiting within school cohort-to-cohort variations in the share of peers with unemployed parents, and by controlling for several individual, class and school level time-variant characteristics, and for school-specific time trends.

We find that a higher exposure to peers with unemployed parents determines a decrease in the aspirations for tertiary education. The effect is sizable and economically meaningful (about 1/10 of a SD). In our findings, in line with the theory developed by Genicot and Ray (2017), the formation of aspirations about tertiary education is particularly sensitive to the framing of the aspiration window from which each student experiences the changes in the economic environment around her. Moreover, the aspiration formation process does not seem to be particularly influenced by gender role norms, nor mediated by changes in the expected value of the education title.

Importantly, we document that the negative effects observed on the aspirations formation translate into subsequent educational choices and effort. First, we document that exposure to peers with unemployed parents at the moment when the aspirations are stated (i.e., in grade 10) negatively affects the effort exerted to complete high school, the probability to enroll at university and the probability of dropping out of university in the freshmen year, which is a strong predictor of the academic success (Adamopoulou and Tanzi, 2017). Second, in line with the theoretical predictions, we show that such effects also display a non-monotonic relation as students from more disadvantaged background find themselves in a frustration condition that would need a stronger intervention on aspirations to be brought back into a good motivational path. Finally, in an instrumental variable estimation framework, we isolate the direct effects of aspirations on later educational outcomes, which turn out to be particularly strong.

Some policy implications might be derived from our findings. First, policies aimed at increasing human capital accumulation should also consider to support students' aspirations about their future, as these clearly translate in effort and future choices.[45] This

[45] See Biroli et al. (2025) for an example of online tutoring aimed at increasing students' soft skills and

is particularity important during economic downturns. Second, these policies should be particularly focused on students in peculiar focal points of their educational career, such as those close to the end of compulsory education – as in the present work – but also, for example, close to the completion of high school, to effectively sustain enrollment in tertiary education. Third, we provide evidence that students from more disadvantaged backgrounds find themselves more frequently in a frustration state. That is, their aspirations would be too high as compared to their starting state so that they would not give any incentive to them to invest more and exert more effort to achieve their goals (Genicot and Ray, 2017). In those cases, stronger policy interventions should be targeted to this cluster of students to support them to reduce their aspiration gap.

aspirations, among others.

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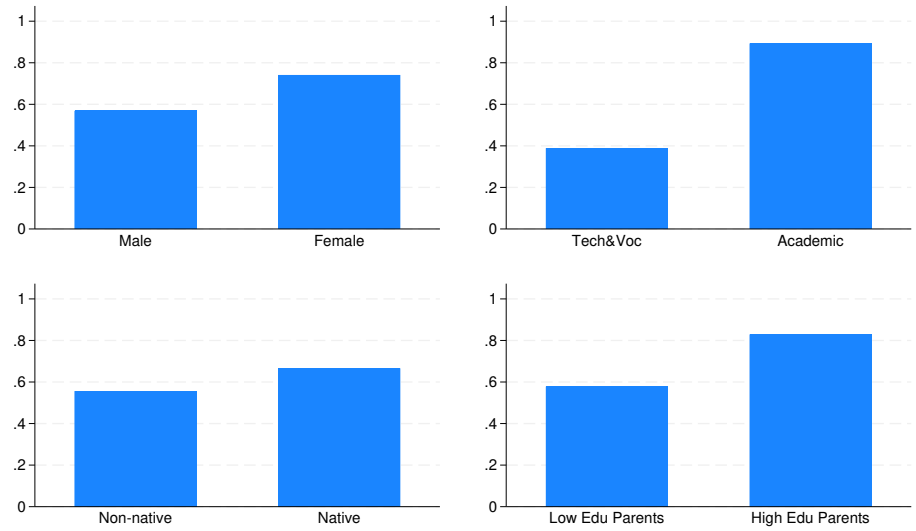
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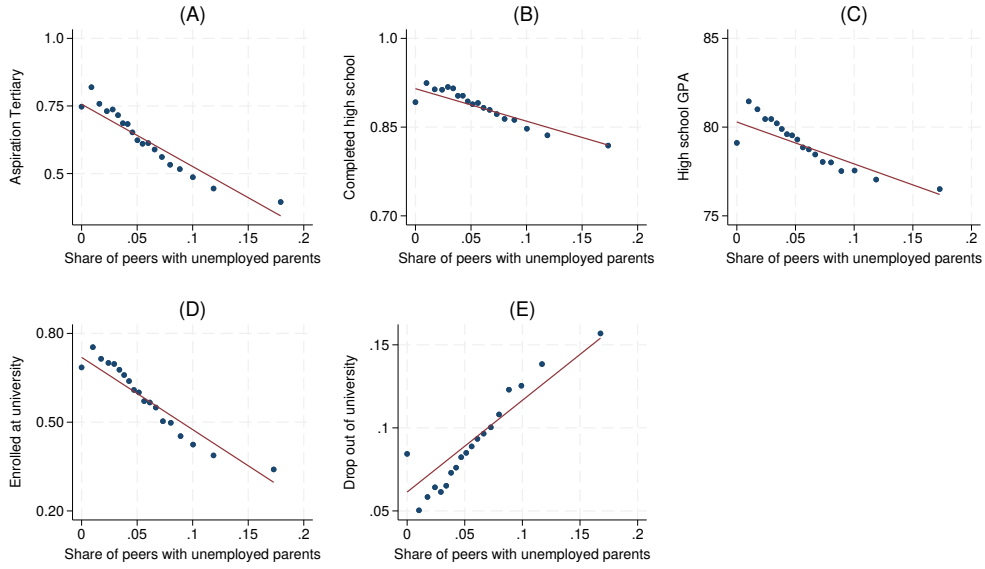
Figures

Figure 1
Students' aspirations by: gender, school type, native and non-native status, parents' education



Notes: the bars show the average of the variable aspiration tertiary by gender, school type (academic and non-academic schools), native and non-native status, parents' education (at least one parent with tertiary education or not). Academic schools cover 53% of the students in the sample. **Source**: own elaboration from Invalsi NEPSA, G10, s.y. 2010-11 to 2017-18.

Figure 2
The share of school peers with unemployed parents, students' aspirations, and educational outcomes



Notes: the graph shows binscatter plots (net of school and cohort fixed effects) of the relation between the share of school peers with unemployed parents and aspiration tertiary (A) and educational outcomes (B)-(E). The estimated slope coefficients and SE are, respectively, for the outcome variables in Panels (A) to (E): -2.3(0.033), -0.5(0.018), -23.6(0.742), -2.4(0.038), 0.6(0.014). **Source**: own elaboration from Invalsi NEPSA, G10, s.y. 2010-11 to 2017-18.

Tables

Table 1
Descriptive statistics

Sample:				
	Aspirations stated in G10		Subsequent educational outcomes	
Variable	Mean	SD	Mean	SD
Aspiration Tertiary	0.656	0.475	0.669	0.470
High school completion			0.896	0.305
High school GPA (†)			79.767	12.496
University enrollment (†)			0.652	0.476
University dropout(*)			0.062	0.242
Share of school peers with unemployed parents	0.053	0.034	0.054	0.033
Share of school peers with unemployed fathers	0.023	0.020	0.023	0.020
Share of school peers with unemployed mothers	0.036	0.026	0.036	0.026
Female	0.505	0.500	0.511	0.500
Non-native 1st. gen	0.045	0.208	0.040	0.196
Non-native 2nd. gen	0.047	0.211	0.046	0.209
Ahead of year	0.018	0.132	0.014	0.116
Repeating year	0.163	0.369	0.129	0.335
Teachers' mark in the first term	6.076	1.138	6.126	1.123
Missing teachers' mark in the first term (dummy)	0.003	0.058	0.003	0.058
Percentile class rank	0.505	0.297	0.504	0.300
At least one parent with tertiary education (dummy)	0.310	0.463	0.325	0.469
At least one unemployed parent	0.052	0.223	0.053	0.225
Unemployed father (dummy)	0.023	0.149	0.023	0.150
Unemployed mother (dummy)	0.035	0.185	0.036	0.186
Share of class peers with unemployed parents	0.053	0.066	0.054	0.068
Female class share	0.501	0.286	0.508	0.285
Ahead of year class share	0.017	0.049	0.014	0.041
Repeating year class share	0.171	0.170	0.133	0.149
Non-native 1st. gen class share	0.051	0.078	0.044	0.071
Non-native 2nd. gen class share	0.047	0.063	0.047	0.065
Class size (no. of students)	20.176	4.679	18.858	4.792
Monitored school (dummy)	0.100	0.300	0.096	0.295
Female school share	0.500	0.211	0.507	0.209
Ahead of year school share	0.017	0.039	0.014	0.032
Repeating year school share	0.174	0.134	0.135	0.112
Non-native 1st. gen school share	0.052	0.055	0.045	0.047
Non-native 2nd. gen school share	0.047	0.038	0.048	0.039
School size (no. of students)	171.564	76.281	161.538	72.866
Average class size in the school	19.241	3.663	17.777	3.763
Cohort size (no. of students)	174199	105000	154914	96189
Observations	2523308		1955060	

Notes: *Dependent variables definitions*: Aspiration Tertiary (1 if aims to enroll in university), High school completion (1 if successfully completed high school); High school GPA† (final grade at the high school diploma, integer $\in [60-101]$); University enrollment † (1 if enrolled at university the year following high school completion); $\dagger$ indicates that the two variables are available only for the subsample of those who completed high school (N=1,761,286); University dropout (1 if drop out from university the in the first year of enrollment); $*$ indicates that the variable is available only for the subsample of those enrolled at university (N=1,147,087). *Other variables definitions*: Female (1 if female), Non-native: 1st gen. (1 if first generation immigrant), Non-native: 2nd gen. (1 if second generation immigrant), Ahead of year (1 if the student has anticipated by one year the beginning of the primary school), Repeating year (1 if the student is grade retained), Teachers' grade in the first term (average teachers' grade in Italian language and math at the end of the first semester in grade 10), Missing teachers' grade in the first term (dummy) (1 if teachers' mark is missing in Italian language or math), Percentile class rank (percentile class rank of teachers' grade in the first term), at least one parent with tertiary education (1 if at least one parent has tertiary education), at least one unemployed (1 if at least one parent is unemployed), unemployed father or mother (1 if father or mother is unemployed); the same variables are used to obtain the corresponding shares within classes and schools; Monitored school (1 if the school has been assigned an external monitor during the NEPSA assessment by Invalsi). **Source**: own elaborations from Invalsi NEPSA (G10, s.y. from 2010-11 to 2017-18) and National Students' Registries (s.y. from 2013-14 to 2020-21).

Table 2
Aspirations formation: Baseline results

	(1)	(2)	(3)	(4)	(5)	(6)
Share of school peers with unemployed parents	-0.1062***	-0.0895***	-0.0780***	-0.0553***	-0.0549***	-0.0565***
	(0.0191)	(0.0184)	(0.0177)	(0.0191)	(0.0192)	(0.0192)
R2	0.28	0.32	0.33	0.33	0.33	0.33
N.Obs.	2523308	2523308	2523308	2523308	2523308	2523308
School and Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual-level controls		Yes	Yes	Yes	Yes	Yes
Class and school level controls			Yes	Yes	Yes	Yes
Linear trends				Yes		
Quadratic trends					Yes	
Cubic trends						Yes

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (5,207 clusters). The specifications progressively include: school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear, quadratic or cubic school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA, G10, s.y. from 2010-11 to 2017-18.

Table 3
Aspirations and investments: Baseline results (reduced form)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High school completion						
Share of school peers with unemployed parents	-0.0171	-0.0031	0.0056	-0.0058	-0.0158	-0.0239
	(0.0183)	(0.0181)	(0.0183)	(0.0192)	(0.0194)	(0.0195)
R2	0.09	0.19	0.19	0.20	0.20	0.20
N.Obs.	1955060	1955060	1952795	1952795	1952795	1952795
Panel B. High school GPA						
Share of school peers with unemployed parents	-1.6906***	-1.6237***	-1.7418***	-2.0170***	-2.1002***	-2.1702***
	(0.5779)	(0.6219)	(0.6124)	(0.6565)	(0.6621)	(0.6695)
R2	0.12	0.43	0.44	0.44	0.44	0.44
N.Obs.	1752302	1752302	1751983	1751983	1751983	1751983
Panel C. University enrollment						
Share of school peers with unemployed parents	-0.0759***	-0.0626***	-0.0501**	-0.0486**	-0.0455**	-0.0447**
	(0.0205)	(0.0205)	(0.0200)	(0.0219)	(0.0220)	(0.0221)
R2	0.25	0.30	0.31	0.31	0.31	0.31
N.Obs.	1752302	1752302	1751983	1751983	1751983	1751983
Panel D. University dropout						
Share of school peers with unemployed parents	0.0431***	0.0416***	0.0406***	0.0333**	0.0314*	0.0304*
	(0.0150)	(0.0150)	(0.0151)	(0.0170)	(0.0170)	(0.0169)
R2	0.04	0.05	0.05	0.06	0.06	0.06
N.Obs.	1112986	1112986	1112815	1112815	1112815	1112815
School and Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual-level controls		Yes	Yes	Yes	Yes	Yes
School-level and regional unempl. rate controls			Yes	Yes	Yes	Yes
Linear trends				Yes		
Quadratic trends					Yes	
Cubic trends						Yes

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (4,331). The specifications progressively include: school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear, quadratic or cubic school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Regional unemployment rate refers to the year of high school completion. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.

Table 4
Aspirations formations: Alterations of the aspiration window

	(1)	(2)	(3)
	Aspiration window:		
	baseline	narrower	wider
Share of school peers with unemployed parents	-0.0553***		
	(0.0191)		
Share of class peers with unemployed parents		-0.0882***	
		(0.0072)	
LLM unemployment rate			-0.0230
			(0.0173)
R2	0.33	0.33	0.33
N.Obs.	2523308	2523183	2296989
FE, controls and linear trends	Yes	Yes	Yes

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (5,207 clusters) for columns 1 and 2; at the LLM (Local Labor Market) level (450 clusters) in column 3. The specifications include school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA, and Istat, Labor Force Survey (2010-2018).

Table 5
Aspirations formation: Heterogeneous effects based on the education of peers' unemployed parents

	(1)	(2)	(3)
Panel A: parents with or w/o secondary education			
Share of school peers with unemployed parents with at least HS Diploma	-0.0327		0.0404
	(0.0495)		(0.0495)
Share of school peers with unemployed parents w/o HS Diploma		-0.0983***	-0.0988***
		(0.0216)	(0.0216)
R. squared	0.33	0.33	0.33
N.Obs.	2523308	2523308	2523308
Panel B: parents with or w/o tertiary education			
Share of school peers with unemployed parents with tertiary education	-0.0327		-0.0230
	(0.0257)		(0.0257)
Share of school peers with unemployed parents w/o tertiary education		-0.1294***	-0.1281***
		(0.0281)	(0.0282)
R. squared	0.33	0.33	0.33
N.Obs.	2523308	2523308	2523308
FE, controls and linear trends	Yes	Yes	Yes

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (5,207 clusters). The specifications include school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA.

Table 6
Aspirations formation: Heterogeneous effects based on students' gender, mothers vs. fathers unemployment status

	(1)	(2)	(3)
	All	Males	Females
Panel A			
Share of school peers with unemployed parents	-0.0553***	-0.0573**	-0.0516**
	(0.0191)	(0.0256)	(0.0241)
R2	0.33	0.33	0.31
N.Obs.	2523308	1248117	1275106
Panel B			
Share of school peers with unemployed fathers	-0.0798***	-0.0681*	-0.0951***
	(0.0296)	(0.0405)	(0.0351)
R2	0.33	0.33	0.31
N.Obs.	2468991	1221410	1247489
Panel C			
Share of school peers with unemployed mothers	-0.0693***	-0.0760**	-0.0537*
	(0.0226)	(0.0305)	(0.0288)
R2	0.33	0.33	0.31
N.Obs.	2516333	1244364	1271880
Mean (SD) of dep. variable:	0.656 (0.475)	0.568 (0.495)	0.741 (0.4384)
FE, controls and linear trends	Yes	Yes	Yes

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (5,207 clusters). The specifications include school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA.

Table 7
Aspirations and investments: Non-monotonic effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Low parents' edu	High parents' edu	Blue collar father	White collar father	Low item pos	High item pos.
			High school completion			
Share of school peers with unemployed parents	-0.0016	-0.0244	0.0064	-0.0348	0.0057	-0.0160
	(0.0214)	(0.0258)	(0.0234)	(0.0228)	(0.0225)	(0.0225)
R2	0.21	0.19	0.21	0.19	0.21	0.19
N.Obs.	1317245	635505	945138	874684	958503	968135
Mean (SD) of dep. variable:	0.883 (0.321)	0.923 (0.266)	0.880 (0.325)	0.921 (0.269)	0.880 (0.325)	0.914 (0.280)
			High school GPA			
Share of school peers with unemployed parents	-1.5758**	-3.2322***	-1.6233**	-2.5858***	-1.8941**	-2.3014***
	(0.7137)	(0.9541)	(0.7885)	(0.8171)	(0.7602)	(0.8006)
R2	0.42	0.48	0.42	0.47	0.43	0.46
N.Obs.	1164747	587173	832778	806485	844375	885962
Mean (SD) of dep. variable:	78.872 (12.346)	81.544 (12.601)	78.856 (12.337)	80.930 (12.579)	79.450 (12.485)	80.171 (12.497)
			University enrollment			
Share of school peers with unemployed parents	-0.0366	-0.0882***	-0.0220	-0.0663**	-0.0391	-0.0635**
	(0.0255)	(0.0334)	(0.0289)	(0.0291)	(0.0277)	(0.0285)
R2	0.30	0.25	0.30	0.29	0.32	0.30
N.Obs.	1164747	587173	832778	806485	844375	885962
Mean (SD) of dep. variable:	0.566 (0.496)	0.771 (0.420)	0.564 (0.460)	0.723 (0.447)	0.592 (0.491)	0.680 (0.466)
			University dropout			
Share of school peers with unemployed parents	0.0295	0.0295	0.0396	0.0290	0.0225	0.0494**
	(0.0222)	(0.0239)	(0.0252)	(0.0218)	(0.0250)	(0.0214)
R2	0.07	0.07	0.07	0.07	0.07	0.07
N.Obs.	659765	452907	469888	583260	499660	602706
Mean (SD) of dep. variable:	0.071 (0.257)	0.0490 (0.216)	0.070 (0.254)	0.054 (0.227)	0.065 (0.246)	0.060 (0.24)

Notes: the table reports coefficients and standard errors (SE) from OLS regressions with robust SE clustered at school level (4,331). The specifications include school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. Low parents' edu is equal to one if none of the parents has a university degree; high parents' edu is equal to one if at least one parent has a university degree; white collar father is equal to one if the employed father is a manager, a member of the arts or professions, an office worker or a school teacher; blue collar father is equal to one if the employed father is self-employed or blue collar; low item possession (pos.) is equal to one if the student has not access to at least one of the following items: a quiet study space, a computer, a desk, an internet connection, a private room, reference materials such as encyclopedias; high item possession (pos.) is equal to one if the student has access to all the mentioned items. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.

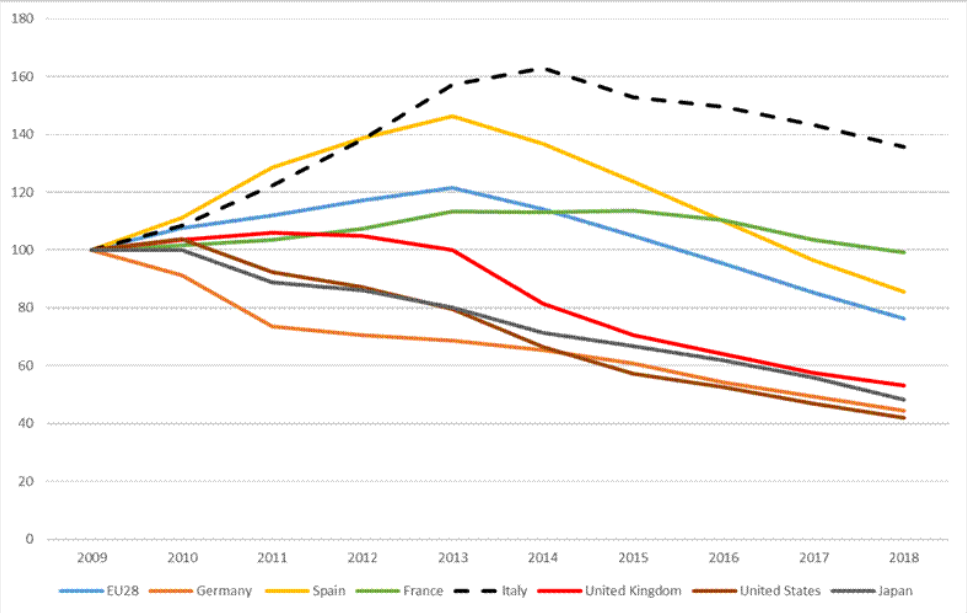
Table 8
The effect of aspirations on subsequent educational outcomes: Instrumental variable estimates

	(1)	(2)	(3)
	First stage	OLS	IV
	Aspiration Tertiary	**High school completion**	
Share of school peers with unemployed parents	-0.0698***		
	(0.0192)		
Aspiration Tertiary		0.0425***	-0.0519
		(0.0007)	(0.2634)
Cragg-Donald Wald F statistic			29.77
N.Obs.	1952795	1952795	1952795
	Aspiration Tertiary	**High school GPA**	
Share of school peers with unemployed parents	-0.0643***		
	(0.0202)		
Aspiration Tertiary		1.9788***	25.8237**
		(0.0255)	(11.1162)
Cragg-Donald Wald F statistic			22.57
N.Obs.	1751983	1751983	1751983
	Aspiration Tertiary	**University enrollment**	
Share of school peers with unemployed parents	-0.0643***		
	(0.0202)		
Aspiration Tertiary		0.2328***	0.6919**
		(0.0017)	(0.3000)
Cragg-Donald Wald F statistic			22.57
N.Obs.	1751983	1751983	1751983
	Aspiration Tertiary	**University dropout**	
Share of school peers with unemployed parents	-0.0619***		
	(0.0222)		
Aspiration Tertiary		-0.0278***	-0.6175*
		(0.0009)	(0.3214)
Cragg-Donald Wald F statistic			15.16
R2	0.32	0.20	0.12
N.Obs.	1112815	1112815	1112815

Notes: the table reports coefficients and standard errors (SE) from OLS and 2SLS regressions with robust SE clustered at school level. The specifications include school and cohort fixed effects (FE), individual-level controls, class and school level controls, and linear school-specific trends. For the list and detailed definitions of all control variables included, see Table 1 and Appendix Table A5. The instrumental variable is for specification in col.3 the share of shool peers with unemployed parents. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.

Supplemental Appendix: Additional Figures and Tables

Figure A1
Unemployment rate in selected EU countries and UK (2009=100)



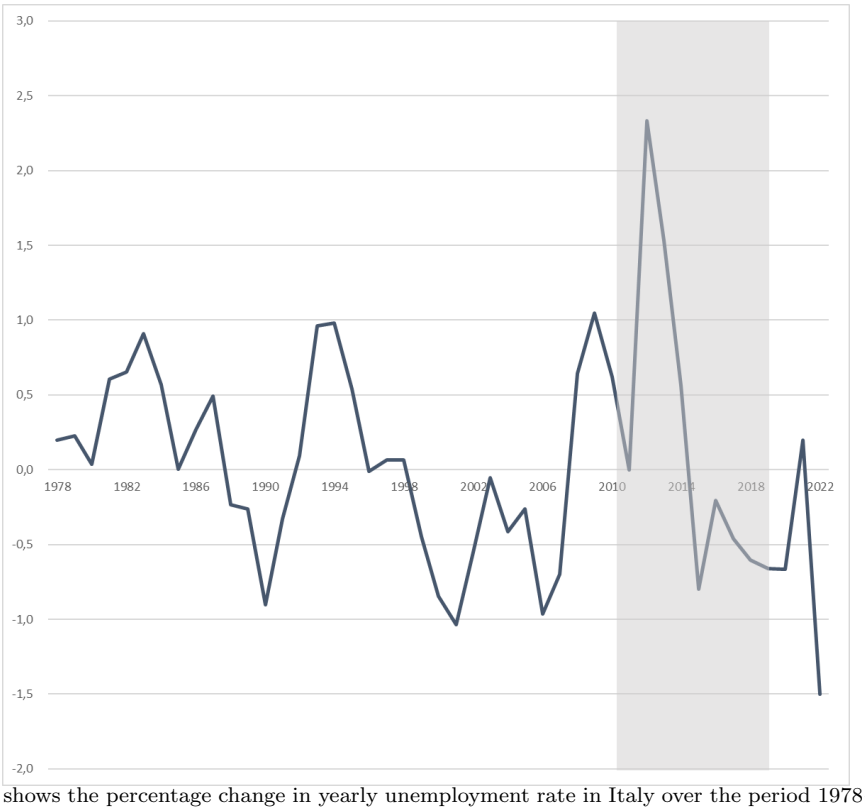
Notes: the figure shows the unemployment rate between 2009 and 2018 (2009=100) in selected EU countries, UK, and EU28 average. **Source**: own elaboration from data from Eurostat.

Table A1
Residual variation

Variation in the share of school peers with unemployed parents	Mean	SD
Raw variable	0.0528	0.0334
Residuals after removing FE and Linear Trend	0.0000	0.0194

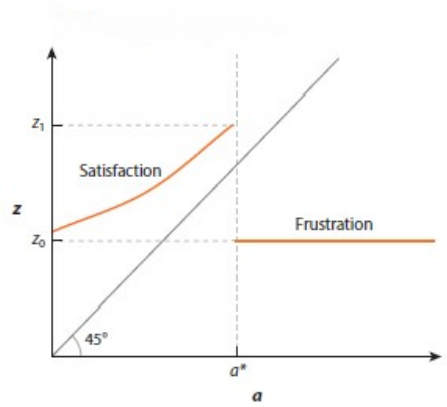
Notes: Robust SE clustered at school level (5,207 clusters); significance levels: *** p<0.01, ** p<0.05, * p<0.1. **Source**: own elaborations from Invalsi NEPSA.

Figure A2
Percentage change in yearly unemployment rate in Italy (1978−2022)



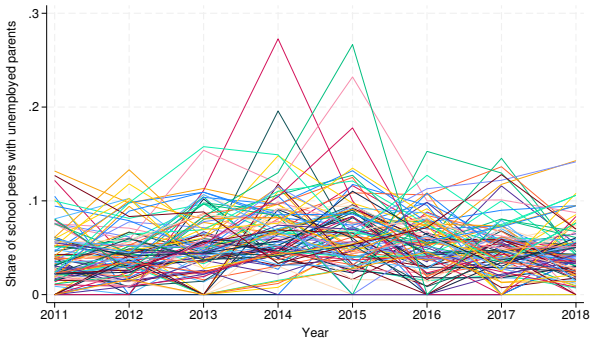
Notes: the figure shows the percentage change in yearly unemployment rate in Italy over the period 1978−2022. The gray area visually identifies the period when students' aspirations were stated. **Source**: own elaboration from data from Italian National Bureau of Statistics.

Figure A3
The non-monotonic relation between aspirations and subsequent investments: a visual representation



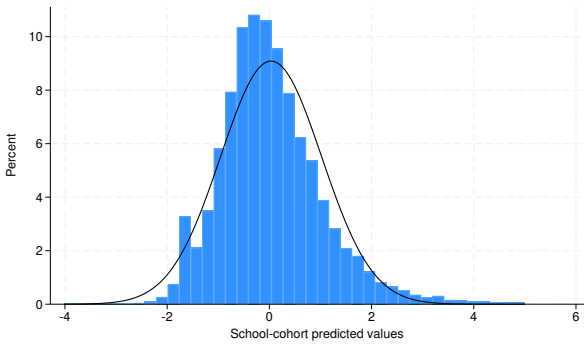
Notes: the figure shows the easiest possible representation of the non-monotonic relation between aspirations (a) and the subsequent investments (z); a^* determines the aspiration level at which the individual passes from the satisfaction to the frustration area. **Source**: Genicot and Ray (2020).

Figure A4
Average share of school peers with unemployed parents by school and cohort



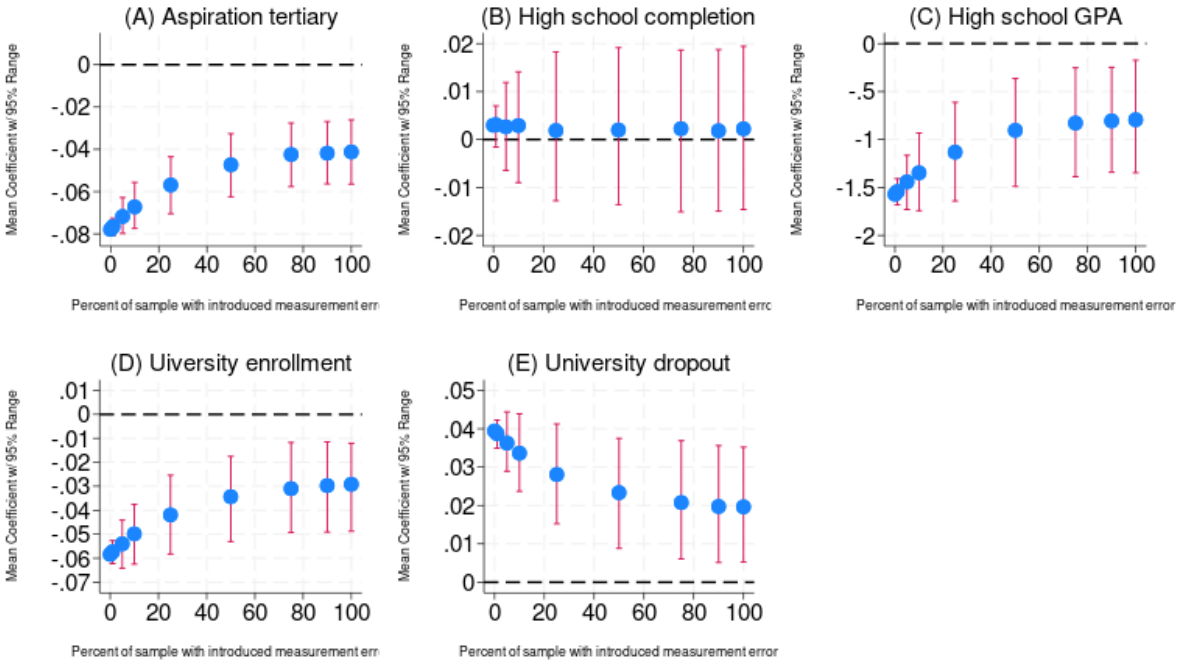
Notes: each line represents the average share of school peers with unemployed parents by school and cohort. For simplicity, five schools are randomly selected in each Italian region. **Source**: own elaboration from Invalsi NEPSA, G10, s.y. 2010-11 to 2017-18.

Figure A5
Cohort-to-cohort variation in share of school peers with unemployed parents within schools



Notes: the histogram shows the predicted share of school peers with unemployed parents from a regression of the share of peers with unemployed parents on school and cohort fixed effects and linear trends; robust SE clustered at school level (5,207 clusters); the black line represents the normal distribution. **Source**: own elaboration from Invalsi NEPSA.

Figure A6
Measurement error: simulation exercise



Notes: the figures show the sensitivity of the effect of the share of school peers with unemployed parents on the outcome variables (aspiration tertiary (A), completed high school (B), high school GPA (C), enrolled at university (D), university dropout (E)) to measurement error in this share. The Y-axis shows the average coefficient from 1,000 regressions: before each regression, for a share of the sample, the unemployed parents dummy variable is replaced with a random value. The X-axis shows the share of the sample. **Source**: own elaboration from Invalsi NEPSA and National Students' Registers.

Table A2
Balancing test: observable students' characteristics

	(1)	(2)	(3)	(4)
	Dep. Var.: $UP_{sct}^{(-i)}$			
Female	0.0000	-0.0000	-0.0000	-0.0000
	(0.0000)	(0.0001)	(0.0000)	(0.0000)
R2	0.58	0.66	0.67	0.67
First generation immigrant	0.0004***	0.0001	0.0001	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.58	0.66	0.67	0.67
Second generation immigrant	-0.0000	-0.0001	-0.0001	-0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.58	0.66	0.67	0.67
Ahead year	-0.0003	0.0000	0.0002	0.0003**
	(0.0002)	(0.0001)	(0.0001)	(0.0001)
R2	0.58	0.66	0.67	0.67
Repeating year	0.0002***	0.0001***	0.0001**	0.0001**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.58	0.66	0.67	0.67
First term grade	-0.0000	-0.0000	-0.0000	-0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R2	0.58	0.66	0.67	0.67
Parents with univ. degree	-0.0001**	-0.0000	-0.0000	-0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R2	0.58	0.66	0.67	0.67
N.Obs.	2523308	2523308	2523308	2523308
School and Cohort FE	Yes	Yes	Yes	Yes
Linear trends		Yes		
Quadratic trends			Yes	
Cubic trends				Yes

Notes: OLS regressions with robust SE clustered at school level (5,207 clusters); each cell represents the coefficient of the correlation between the share of school peers with unemployed parents ($UP_{sct}^{(-i)}$) and the observable characteristic reported in each row. **Source**: own elaborations from Invalsi NEPSA.

Table A3
Balancing test on sub-samples: observable students' characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.: $UP_{sct}^{(-i)}$	Completed high school subsample				Enrolled at university subsample			
Female	0.0000	-0.0000	-0.0000	-0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000))	(0.0000)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
First generation immigrant	0.0003***	0.0001	0.0000	0.0000	0.0003**	0.0001	0.0001	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
Second generation immigrant	-0.0000	-0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
Ahead year	-0.0008***	-0.0002	-0.0002	-0.0001	-0.0008***	-0.0003*	-0.0002	-0.0002
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
Repeating year	0.0001	-0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
First term grade	-0.0001	0.0000	-0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.0001)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
Parents with univ. degree	-0.0001**	-0.0000	-0.0000	-0.0000	-0.0002***	-0.0001*	-0.0001*	-0.0001*
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
R2	0.57	0.66	0.67	0.67	0.54	0.64	0.64	0.64
N.Obs.	1752302	1752302	1752302	1752302	1112986	1112986	1112986	1112986
School and Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Linear trends		Yes				Yes		
Quadratic trends			Yes				Yes	
Cubic trends				Yes				Yes

Notes: OLS regressions with robust SE clustered at school level (5,207 clusters); each cell represents the coefficient of the correlation between the share of school peers with an unemployed parents ($UP_{sct}^{(-i)}$) and the observable characteristic reported in each row. **Source**: own elaborations from Invalsi NEPSA.

Table A4
Balancing test: student's status with unemployed parent and share of peers with unemployed parents

	(1)	(2)	(3)	(4)	(5)	(6)
	Dep. Var.: $UP_{sct}^{(-i)}$					
At least one parent unemployed	-0.0008***	0.0010***	0.0009***	-0.0005***	-0.0006**	-0.0006**
	(0.0001)	(0.0002)	(0.0002)	(0.0003)	(0.0003)	(0.0003)
R2	0.58	0.58	0.58	0.67	0.67	0.67
N.Obs.	2523308	2523308	2523308	2523308	2523308	2523308
School and Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Guryan et al. (2009) correction		Yes	Yes	Yes	Yes	Yes
Controls			Yes	Yes	Yes	Yes
Linear trends				Yes		
Quadratic trends					Yes	
Cubic trends						Yes

Notes: OLS regressions with robust SE clustered at school level (5,207 clusters); each cell represents the coefficient of the correlation between the share of school peers with an unemployed parents ($UP_{sct}^{(-i)}$) and the parents' occupational status of the $i-th$ student. **Source**: own elaborations from Invalsi NEPSA.

Table A5
Baseline results on aspiration tertiary and subsequent educational outcomes with full controls list

	(1)	(2)	(3)	(4)	(5)
	Aspiration tertiary	High school completion	High school GPA	University enrollment	University dropout
Share of school peers with unemployed parents	-0.0553***	-0.00580	-2.017***	-0.0486**	0.0333**
	(0.0191)	(0.0192)	(0.656)	(0.0219)	(0.0170)
At least one unemployed parent	-0.0204***	-0.0159***	-0.286***	-0.0234***	0.00712***
	(0.0013)	(0.0011)	(0.0341)	(0.0015)	(0.0012)
Female	0.0516***	0.0112***	1.151***	0.0209***	-0.0174***
	(0.0008)	(0.0006)	(0.0238)	(0.0010)	(0.0006)
First generation immigrant	0.0376***	-0.0320***	-0.225***	-0.00466**	0.00172
	(0.0016)	(0.0017)	(0.0475)	(0.0022)	(0.0019)
Second generation immigrant	0.0319***	-0.0404***	-0.548***	-0.00340*	0.00488***
	(0.0017)	(0.0014)	(0.0395)	(0.0019)	(0.0014)
Ahead year	0.0006	-0.0063***	0.931***	0.0240***	-0.0064***
	(0.0017)	(0.0014)	(0.0587)	(0.0024)	(0.0018)
Repeating year	-0.0435***	-0.198***	-2.252***	-0.0795***	0.0313***
	(0.0011)	(0.0014)	(0.0314)	(0.0015)	(0.0015)
At least one parent with tertiary education	0.1128***	0.0082***	0.806***	0.0693***	-0.0081***
	(0.0016)	(0.0005)	(0.0187)	(0.0013)	(0.0005)
Teachers' mark in the first term	0.0502***	0.0330***	3.412***	0.0666***	-0.0148***
	(0.0013)	(0.0009)	(0.0776)	(0.0018)	(0.0006)
Missing teachers' mark in the first term	0.0031	-0.0277***	0.0654	-0.0059	0.001
	(0.0060)	(0.0064)	(0.276)	(0.0085)	(0.0056)
Percentile class rank	0.0502***	0.0833***	11.92***	0.0627***	-0.0229***
	(0.0042)	(0.0031)	(0.226)	(0.0056)	(0.0020)
Female class share	0.0976***	0.0192***	1.836***	0.0650***	-0.0080***
	(0.0051)	(0.0020)	(0.0845)	(0.0058)	(0.0017)
Non-native 1st gen. class share	-0.1112***	-0.0590***	-0.898***	-0.0813***	0.0122*
	(0.0116)	(0.0076)	(0.217)	(0.0125)	(0.0065)
Non-native 2nd gen. class share	-0.1073***	0.0038	-1.108***	-0.0879***	0.0118**
	(0.0108)	(0.0058)	(0.207)	(0.0105)	(0.0053)
Ahead of year class share	0.1384***	0.0021	4.231***	0.191***	-0.0586***
	(0.0143)	(0.0093)	(0.440)	(0.0182)	(0.0091)
Repeating year class share	-0.3359***	-0.123***	-5.039***	-0.416***	0.0842***
	(0.0091)	(0.0064)	(0.159)	(0.0107)	(0.0046)
Female school share	-0.0324***	-0.0069	0.279	-0.0096	-0.0019
	(0.0089)	(0.0097)	(0.291)	(0.0109)	(0.0069)
Non-native 1st gen. school share	0.1349***	-0.0425*	2.041***	0.0919***	-0.0760***
	(0.0225)	(0.0228)	(0.752)	(0.0293)	(0.0208)
Non-native 2nd gen. school share	0.0869***	0.0462**	1.901***	0.0878***	-0.0361**
	(0.0218)	(0.0220)	(0.715)	(0.0259)	(0.0183)
Ahead of year school share	-0.0701***	-0.226***	-5.067***	-0.126***	0.0086
	(0.0253)	(0.0344)	(1.057)	(0.0352)	(0.0223)
Repeating year school share	0.2340***	0.0531***	2.228***	0.229***	-0.0184
	(0.0137)	(0.0158)	(0.456)	(0.0179)	(0.0134)
Average class size in the school	-0.0020***	0.0000	-0.0256***	-0.00306***	0.0000
	(0.0003)	(0.0003)	(0.0099)	(0.0003)	(0.0002)
School size (No. of students)	-0.0002**	0.0000	-0.0047*	0.0002*	-0.0001*
	(0.0001)	(0.000)	(0.0028)	(0.0001)	(0.0000)
Monitored school (dummy)	-0.0066***	-0.0073***	-0.0919**	-0.0083***	0.0006
	(0.0014)	(0.0011)	(0.0386)	(0.0018)	(0.0009)
Regional unemployment rate		-0.0321***	-0.215***	0.0264***	-0.0113***
		(0.001)	(0.0264)	(0.001)	(0.0007)
Constant	0.2343***	1.123***	54.46***	-0.0423	0.483***
	(0.0349)	(0.0320)	(1.050)	(0.0342)	(0.0229)
R2	0.33	0.2	0.44	0.31	0.06
N.Obs.	2,523,308	1,952,795	1,751,983	1,751,983	1,112,815
School and Cohort FE	Yes	Yes	Yes	Yes	Yes
Linear trends	Yes	Yes	Yes	Yes	Yes

Notes: OLS regressions with robust SE clustered at school level. School and cohort FE indicate the inclusion of the full set of school and cohort fixed effects, and school-specific linear trend; for the definitions of the control variables included see Table 1. The unemployment rate is taken form the Italian Labor Force Survey (Italian Bureau of Statistics), at the regional level in the year of high school graduation. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.

Table A6
Estimates of the effects on aspiration formation on the educational outcomes sample

	(1)	(2)	(3)	(4)	(5)	(6)
Share of school peers with unemployed parents	-0.0932***	-0.0799***	-0.0709***	-0.0539**	-0.0531**	-0.0531**
	(0.0202)	(0.0198)	(0.0192)	(0.0213)	(0.0212)	(0.0213)
R2	0.27	0.31	0.32	0.33	0.33	0.33
N.Obs.	1955060	1955060	1955060	1955060	1955060	1955060
School and Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Individual-level controls		Yes	Yes	Yes	Yes	Yes
Class and school level controls			Yes	Yes	Yes	Yes
Linear trends				Yes		
Quadratic trends					Yes	
Cubic trends						Yes

Notes: OLS regressions with robust SE clustered at school level (4,344 clusters); mean (SD) of asp. tertiary: 0.669 (0.470). The table reports the baseline estimation for aspiration tertiary formation (as in Table 2 on the sub-sample given by the merge with subsequent educational outcomes which excludes the older cohort of students. Significance levels: * p<0.1, ** p<0.05, *** p<0.01. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.

Table A7
Sensitivity and robustness checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A. Aspiration Tertiary							
Share of school peers with unemployed parents	-0.0520***	-0.0190	-0.0567***	-0.0554***	-0.0603***	-0.0554***	-0.0475**
	(0.0193)	(0.0191)	(0.0191)	(0.0191)	(0.0204)	(0.0191)	(0.0188)
R2	0.33	0.34	0.33	0.33	0.33	0.33	0.34
N.Obs.	2523308	2522633	2522660	2523308	2296989	2523308	2455682
Panel B. High school completion							
Share of school peers with unemployed parents	-0.0127	-0.0036	0.0033	-0.0032	-0.0064	-0.0053	-0.0047
	(0.0204)	(0.0192)	(0.0192)	(0.0194)	(0.0207)	(0.0192)	(0.0192)
R2	0.20	0.19	0.21	0.19	0.20	0.20	0.20
N.Obs.	1952795	1952711	1952772	1928722	1745018	1952485	1926654
Panel C. High school GPA							
Share of school peers with unemployed parents	-2.2153***	-1.5390**	-1.9814***	-1.9950***	-2.5654***	-2.0334***	-2.0552***
	(0.6927)	(0.6334)	(0.6560)	(0.6609)	(0.6968)	(0.6571)	(0.6597)
R2	0.44	0.47	0.44	0.44	0.44	0.44	0.44
N.Obs.	1751983	1751917	1751972	1733199	1568247	1751702	1730362
Panel D. University enrollment							
Share of school peers with unemployed parents	-0.0481**	-0.0273	-0.0470**	-0.0477**	-0.0471**	-0.0491**	-0.0497**
	(0.0230)	(0.0224)	(0.0219)	(0.0221)	(0.0228)	(0.0219)	(0.0219)
R2	0.31	0.32	0.31	0.31	0.31	0.31	0.31
N.Obs.	1751983	1751917	1751972	1733199	1568247	1751702	1730362
Panel E. University dropout							
Share of school peers with unemployed parents	0.0301*	0.0299*	0.0333*	0.0339**	0.0439**	0.0348**	0.0359**
	(0.0174)	(0.0168)	(0.0170)	(0.0171)	(0.0185)	(0.0170)	(0.0171)
R2	0.06	0.06	0.06	0.06	0.06	0.06	0.06
N.Obs.	1112815	1112762	1112806	1100580	1003851	1112672	1102481
Specification:							
(i) Winsorized sample	Yes						
(ii) Achievement measure		Yes					
(iii)Year of birth FE			Yes				
(iv) Regional UR				Yes			
(v) LLM UR					Yes		
(vi) Regional income						Yes	
(vii) High home possessions							Yes

Notes: OLS regressions with robust SE clustered at the school level. Specifications: (i) the variable UP is winsorized at the 1 and 99 percentiles; (ii) the Invalsi test score in grade 10 is used as achievement measure; (iii) year of birth fixed effects are added; (iv), (v) and (vi) add, respectively, the regional and local labor market unemployment rate of 35-65 years-old individuals, the regional average yearly household net income; (vii) adds the high home possession dummy variable: equal to one if the student has access to all considered items (a quiet study space, a computer, a desk, an internet connection, a private room, and reference materials such as encyclopedias) at student, class and school levels. **Source**: own elaborations from Invalsi NEPSA and National Students' Registries.