Temi di discussione

Educational choices and the selection process
before and after compulsory schooling

by Sauro Mocetti

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EDUCATIONAL CHOICES AND THE SELECTION PROCESS BEFORE AND AFTER COMPULSORY SCHOOLING

by Sauro Mocetti [§]

Abstract

The aim of this paper is to analyze the selection process at work before and after compulsory schooling by assessing the determinants of school failures, dropouts and upper secondary school decisions of young Italians. The dataset is built combining individual data from the Labor Force Survey and aggregate data on local labor markets and school supply from the Italian National Statistical Institute and the Ministry of Education, respectively. Our results show that school failure (i.e., repetition of a year) is highly correlated to family background, and strongly affects later choices. Early school leaving and upper secondary school choice are mainly a reflection of parents' socio-economic status. The effectiveness of the educational system in narrowing the risk of failure and the scholastic outflow depends on the widespread adoption of full-time attendance in compulsory school, the quality of school infrastructures and the reduction of the number of teachers on temporary contracts.

Contents

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1. Introduction[1]

The accumulation of human capital represents a critical element both when defining the socioeconomic condition of an individual as well as for the development and progress of a nation. At a microeconomic level, educational benefits are such that the better educated an individual is the higher his employment probability and the steeper his age-earnings profile. In macroeconomic terms, the level and quality of human capital represent compelling and driving forces for the economic growth of a nation.[2] The process for the acquisition of human capital includes different formal education cycles plus training in the work environment. When looking at this education path, we focus our attention on the transition from compulsory school to upper secondary school, which in Italy normally happens when a young person reaches age 14. More specifically, this paper primarily concentrates on two specific issues: the first is the analysis of school failures during compulsory school; the second concerns the young individuals' choices after the completion of compulsory school.

Understanding the nature and determinants of these phenomena is important for several reasons. First, a decrease in the dropout rate immediately after compulsory school has become one of the major items on the EU member States' political agendas since the importance of this issue was highlighted at the Lisbon Conference.[3] Second, an analysis of the determinants of the early selection process is necessary to better understand the results of international surveys, such as PISA, since a not negligible fraction of 15-year-old Italians do not attend upper secondary school and therefore are not interviewed. Finally, given that economics is often defined as the theory of choice, the transition from compulsory to upper secondary school represents the first circumstance when an individual faces a choice. Moreover, given its strong influence on future education and one's professional career, this is probably one of the most important decisions an individual will ever make.[4]

Such a transition has been the subject of intense political debate where the feasibility of raising the bar for compulsory school and redefining school tracks are highly contentious subjects. On one hand, differentiation of the educational path, where a course of studies is chosen early, may provide a good opportunity to specialize one's skills and knowledge. Furthermore, a school system organized in separate tracks may provide different prospects to students with different abilities and it may be capable of matching them to their most

[2] In addition, education is typically correlated with improvements in health, a decline in the crime rate, and an increase in the use of liberty rights.
[3] By international standards, Italy is characterized by low educational attainment, even if most recent cohorts seem to catch up in order to reduce the gap; in 2007, still one young individual out of five (age bracket 18–24) leaves school early.
[4] Although formally open, the educational system in Italy is *de facto* a tracked and closed system because the educational career is heavily conditioned on early track choices.

appropriate destinations. As a consequence, it may also encourage school participation to less motivated and less capable youngsters. On the other hand, the extension of compulsory school on the grounds of a comprehensive educational system will allow a common consolidation of every student's abilities and will reduce the role of the family in educational choices, fostering young individuals to give more thought to their own interests and skills.[5] When tracking takes place at early ages, pupils' abilities and interests can only be measured with substantial noise; this may lead to errors in the educational choice process, thus increasing the risk of future failures, track changes or, even, dropouts.

Our goal is to put some empirical evidence into the debate and, in particular, we want to assess *i*) how much family background matters, *ii*) the role of the labor market in explaining post-compulsory educational choices, and *iii*) how the educational system performs in removing social stratification, and what are the most effective policies in reducing school failures and dropouts. Unfortunately we cannot adequately keep ability under control and we cannot disentangle direct and indirect effects of family background (more on this below); therefore, our estimated coefficients have to be interpreted as total effect of family background. As far as the school variables are concerned, we extended the set of covariates including, apart from traditional school inputs such as the pupils-class ratio, those related to the functioning of the educational system (i.e. the adoption of full time), the quality of school infrastructures and those that measure the composition (and not only the size) of the teachers pool. The availability of these variables represents one of the innovative features of this paper.

The dataset is built combining individual data from the Labor Force Survey (LFS) and aggregate data on local labor markets and school supply provided by the Italian National Statistic Institute (Istat) and Minister of Public Education (MPE), respectively. The school failures during compulsory school and the young individuals' choices after the completion of compulsory school are examined with two distinct empirical exercises.

In the first, we select a sample of 15-year-old Italians and we observe whether they have already experienced a school failure. Despite the relevance of this phenomenon, any analyses of its determinants are rather scanty. We find that parents' schooling significantly reduces the likelihood of repeating the year for their children. The failure risk for children whose parents have only compulsory education is 10 times more than that of children from graduated. Given that having to repeat a year of school strongly affects decisions in later stages and it is strongly correlated with the family background, we argue that the social selection process starts in compulsory schooling. The effectiveness of the educational system when narrowing the failure risk relies on the widespread adoption of full-time attendance in compulsory school and the fewer teachers with temporary contracts. Full time seems to play a role also in reducing the impact of family background. On the contrary, the pupils-class ratio does not have a significant effect.

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[5] The debate on school reform reflects a concern about the role of education in the current economic context that is characterized by the importance of specialization but also by the ongoing transformation of production processes, leaving human capital to be considered obsolete in a shorter time frame with respect to the recent past.

In the second empirical exercise, we consider a flow sample obtained selecting all the individuals who complete compulsory school the year before the interview. We observe what they decided: whether to quit school or to continue with upper secondary school; if the latter was the case, we observe the type of school chosen. The single most powerful predictor of dropping out is previous school failure; its impact is sizeable for less educated parents and almost negligible for the more educated. Among the school inputs, full time and better school infrastructures positively affect the probability of staying in school. On the contrary, we didn't find any significant relationship between unemployment rate and early dropout behaviors. As far as school track is concerned, those who continue to study make a choice that strongly affects later school transitions and professional career. However, most of the literature has investigated the determinants of the level of education achieved (the number of years of schooling or the highest educational qualification) whereas the type of the education is less explored. [6] We find that these decisions depend upon the cultural capital and the socioeconomic status of the parents, which highlights, once again, the feebleness of the Italian educational system to create a mechanism for mixing different social classes. Basically, the son whose parents have a college degree has a higher probability of choosing an academically oriented education (*licei*), whereas the choice of the son of a blue-collar worker will likely be a technical or vocational school. A higher incidence of services, rather than industry, among economic activities seems to play a role in driving enrollment decisions, especially towards technical and vocational schools.

The paper is organized as follows. In the next section, we discuss the theoretical and literature background. In section 3 we present a descriptive assessment of the variables that have been considered for the research. In section 4, we examine the determinants of scholastic delay during compulsory school. In section 5, we analyze educational choices right after compulsory school focusing on early dropouts and, for those who continue, the school choice. Section 6 contains concluding remarks and discusses some policy options.

2.   The Theoretical Framework

The selection process at work before and after the completion of compulsory school is highly relevant because student results and choices at this age have a strong influence on future education and one's professional career. The aim of this paper is to empirically assess *i*) how much family background matters, *ii*) what is the role of the labor market in post-compulsory educational choices, and *iii*) how the educational system perform in reducing school failures and dropouts and what are the most effective policies.

As widely emphasized by the literature, family background plays a crucial role in a child's education (Haveman and Wolfe, 1995).[7] The impact of family background can operate

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[6] See, among the few exceptions, Ashworth and Evans (2001), Montmarquette *et al.* (2002), Nguyen and Taylor (2003), Dustmann (2004) and, for Italy, Checchi and Flabbi (2006).

[7] See also Ermisch and Francesconi (2001). Checchi *et al.* (1999), Checchi and Zollino (2001), Checchi *et al.* (2007) and Mocetti (2007) find a strong immobility across generations in Italy.

through several channels. The literature on educational attainment usually refers to direct and indirect effects. Direct effects, whether genetic or cultural, create disparities in "demonstrated ability" depending on the social origin (Erikson and Goldthorpe, 2002). Parents can transmit to their children genetic skills or traits that may foster or impede educational career. In addition, environmental influences in the post-birth period may affect the cognitive development and human capital formation. Indirect effects are those that operate through the choices that children, together with their parents, actually make among the options they have available. They are supposed to explain why, even when level of demonstrated ability is held constant, children of more advantaged class origins take more ambitious educational options – for instance, stay on rather than leave or choose academic rather than vocational courses – than do children of less advantaged origins. Focusing on young individuals while they are still living with their families, we are able to trace the occupational status and educational level of both parents: these variables are supposed to capture the economic status and cultural background of the family. Unfortunately individual ability is not observable and we cannot separately identify primary and secondary effects. Therefore our estimated coefficients have to be interpreted as total effect of family background.

The local labor market is the context in which to evaluate the profitability of investment in human capital. However its role, such as that of unemployment rate, is far more uncertain. On one hand, a high probability of employment might convince students to quit school and enter the labor market. On the other hand, the higher expected education returns could definitely be a stimulus for acquiring further education.[8] We also consider the prevailing sectors of activity in order to analyze the relationship between the demand of the local labor market and the investment in level and type of education.

Finally, an analysis on the effectiveness of school inputs can provide some suggestions about policy options. However, the estimations of educational production functions are complicated because there are many outputs from education and many inputs in the production process, and also because it may be difficult to obtain good measures of both of them.[9] Measures of school inputs typically include expenditure per pupil and class size. Nonetheless, the empirical evidence seems to counteract their relevance.[10] Furthermore, these indicators are not the proper ones for Italy where, from a formal standpoint, the scholastic system reveals a high level of standardization. That is, school programs are comparatively homogeneous and the number of students per class and/or per school is often a consequence of the needs imposed by the territorial context, rather than real quality indicators. We have therefore considered other variables in an attempt to better identify and assess all inputs on the school production function. These variables include: the adoption of full time in compulsory school,

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[8] Rees and Mocan (1997) and Rice (1999) found a negative relationship between the unemployment rate and the dropout risk.

[9] Measures of outputs are typically student performance (measured by cognitive tests or school failures), educational attainment, or labor-market outcomes (particularly earnings).

[10] There exists an extensive literature on the effect of school inputs on students' outcomes; see, among others, Card and Krueger (1996), Hoxby (1998), Angrist and Lavy (1999) and Hanushek (2003). The majority of the empirical studies do not find a significant relationship between resources employed and school outputs; if this were true, then an increase in the amount of resources would have only a negligible effect on students' learning and school outflow.

the quality of school infrastructures and the percentage of teachers with temporary contracts. The adoption of full time is important for several reasons. It solves practical problems for those families where both parents work, and it represents an opportunity for the educational development of those who come from a less-advantaged families and with a smaller amount of cultural capital at home. Additional time at school may also afford more chances to fill the gap for those who stay behind and to better organize the didactics and the learning moments. The low maintenance on certain buildings and the use of school structures that are inappropriate for teaching activities may affect the level and quality of the teaching itself and could consequently create a rather unstimulating school environment. Poor school infrastructures can also approximate the level of spending of local authorities and how much education is evaluated in the local context. Finally, it is a matter of fact that students' achievements are affected by teachers' quality and motivation.[11] However, reliable information about these traits is not available. We try to gain insights about teachers' effort and motivation looking at the composition of the teachers' pool in terms of temporary vs. permanent contracts. In Italy, temporary contracts are used to fill vacancies due to absences and to the fact that tenured teachers are lower than needed teaching positions; furthermore, they are not used as screening devices, also because of the lack of an evaluation system (Barbieri *et al.*, 2007). Therefore, we consider the incidence of temporary teachers in the teachers' pool as a proxy of the degree of motivation and effort of the teaching staff. The assumption is that temporary teachers have a lower incentive to well perform since their future chances depend on the accumulation of seniority rights rather than their teaching activity, they have a shorter temporal perspective of the job and it is absent any evaluation mechanism for their activity. Negative implications of temporary contracts include also the peregrination of teachers among school with lack of didactical continuity and lesser knowledge of the needs of the class.

3. Data and Variables

The following subsections describe the dataset and the explanatory variables and provide a first descriptive assessment of the educational attainment of young Italians and of the institutional and structural features of the Italian education system.

3.1 Data

Information about individual educational outcomes is drawn from LFS. The main scope of the survey is to supply accurate and official statistics regarding the employed and unemployed population in Italy. Furthermore, it also offers an interesting section concerning individuals' choice about schooling and training. This survey is carried out on a quarterly basis, and the

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[11] Aaronson *et al.* (2007), using administrative data from the Chicago public high schools, find that "teachers matter" and that the vast majority of the variation in teacher effects on student mathematics test score gains is unexplained by traditional human capital measures. Unfortunately, microdata on youngsters' teachers are not available and we proxy their characteristics with administrative data at a province level. See Barbieri *et al.* (2007) for an analysis of the socioeconomic conditions of the teachers and the characteristics of their labor market in Italy.

representative sample is approximately 76.800 families per period. Individuals are interviewed from their fifteenth birthday onwards. We rely on data gathered in 2004 and 2005.

In the first empirical exercise we focus on the determinants of school delay for 15-year olds. The sample was composed of all 15-year olds who were interviewed during the first half of the year and who had birthday before the interview. In order to provide a graphical picture of the phenomenon being analyzed, *Table 1* lists all the possible situations faced by the youngsters, just as the database identified them. We remind everyone that a 15-year old Italian, in a regular course of studies, have completed compulsory school and is attending, in the first semester of the year, his first year of upper secondary school.[12] Four different scenarios can be noted: more than 4 percent of 15-year-old Italians drop out of the educational system, and there is a fraction of these who leave school without any certificate. A significant percentage of the students (nearly 8 percent) are behind in their schooling and are still enrolled in compulsory school. The remaining 88 percent are regularly enrolled in upper secondary school.[13]

Table 1: The educational status of 15-year olds (1)

	All sample	North	South
Not enrolled and never completed compulsory school	0.7	0.3	1.2
Not enrolled after completion of compulsory school	3.5	2.7	4.4
Still enrolled in compulsory school (delay)	7.9	7.5	8.5
Regularly enrolled in upper secondary school	87.9	89.5	85.9

Source: *LFS*.
(1) The sample includes all 15-year olds who were interviewed during the first half of the year (2004 or 2005) and who had birthday before the interview. The number of observations is 1,837.

In the second empirical exercise, the sample is composed of all youngsters aged 15-19 who have been interviewed during the first half of the year and who completed the compulsory school the year before. Therefore, this flow sampling includes both those who are "regular" and those who completed compulsory school with a delay. The latter represent 7.2 percent of the sample and a fraction of these (1.6 per cent) repeated at least 2 years in compulsory school. About 5 percent of the youngsters choose to not continue their education; there are also territorial differences, with the South lagging behind in terms of early dropout rates. Conversely, about 95 percent of the youngsters are enrolled in upper secondary school,

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[12] In Italy, compulsory education includes primary (from 6 to 11) and lower secondary school (from 11 to 14). In recent years, the system has undergone several reforms. The compulsory school attendance has been raised to age 15 and then to age 16. It has also been introduced a generic principle of the right and obligation to receive an education or training until age 18. In fact, age 14 has remained an important crossroads. The upper secondary school includes an academically oriented generalist education provided by *licei* (with a further division in humanities, scientific activities, languages, and pedagogical sciences), a technically oriented education provided by *istituti tecnici* (with further differentiations according to the type of job), and vocational training offered by *istituti di formazione professionale*.
[13] The situation described by LFS reflects the same information as that provided by the administrative data. The participation rate at 15-years of age is slightly lower than 95 percent, even if 10 percent are still enrolled in compulsory school, and most of them have repeated a year in lower secondary school. See tables A.1 and A.2 in the Appendix.

most of them in *licei* and technical schools (see *Table 2*). Art and teaching school are chosen by 11 percent of the sample, with a strong gender divide: the percentage is 4 percent for males and rises up to 19 percent for females.[14]

Table 2: The educational choices after the completion of compulsory school (1)	
Not enrolled	5.1
Enrolled	94.9
Vocational schools	*16.3*
Technical schools	*31.0*
Licei	*36.7*
Art and teaching school	*10.9*

Source: *LFS.*
(1) The sample includes all the youngsters who complete compulsory school the year before the interview. They were interviewed during the first half of the year (2004 or 2005) and had birthday before the interview. The number of observations is 1,553.

3.2 Explanatory Variables

The LFS survey has been supplemented with other explanatory variables collected from different sources. The set of covariates can be grouped into: (1) Individual characteristics that include gender, age, birth order, and family background, which includes parental age, education, and employment status, and family size. (2) Location variables, such as the presence of a metropolitan area, unemployment rate, and prevailing sectors of activity. (3) School characteristics that include the pupils-class ratio, quality of infrastructures, presence of full time, and incidence of teachers with temporary contracts.

Variables in group (1) are drawn directly from LFS. Variables in group (2) come from Istat and include sociodemographic indicators and labor-market characteristics of the province in which an individual resides.[15] Variables in group (3) are provided by MPE and are collected at the province level. *Table A.4* in the appendix provides a detailed description of the variables, while in the following we describe only some covariates of special interest.

In Italian lower secondary school there are about 20 pupils per class. Class size is slightly larger in the North; however, the pupils-class ratio is quite homogenous across provinces. Full time is present in about 30 percent of lower secondary schools. The adoption of full time shows substantial territorial differences and depends on several factors. On one side, it is demanded by families, especially in those areas where female participation in the labor market is higher. There are also supply factors linked to policy goal of local administrations and the availability of resources at the local level. The percentage of teachers with temporary contracts in lower secondary school is 17 percent; the incidence is larger than for the other employees (Barbieri *et al.*, 2007). Finally we have detailed information about the quality of school infrastructure. In the North, the percentage of lower secondary school with a

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[14] Data on track choices reflect those available from administrative sources. See table A.3 in the Appendix.
[15] Province is an intermediate level between region and municipality; we consider a partition of the territory in 103 provinces.

bad hygienic and heating system is 17 and 10 percent, respectively; in the South these percentages double. Starting from elementary indicators we built an index that proxy the overall quality of school infrastructures. This index is obtained averaging the percentages of schools with buildings unfit to school, of those improperly adapted to teaching activity, and of those with poor maintenance of floors, heating systems, wirings, bathroom fixtures and fittings. See *Figure A.1* in the Appendix for a graphical picture of the quality of school infrastructures across provinces.

It is likely that other unobserved spatial characteristics play a role in the educational choices. In order to avoid misspecification problems and to take into account any "geographical" determinants, we include area and regional fixed effects in all regressions.

4. School Failures

To address the determinants of school failures, we select a sample of individual aged 15, the minimum age interviewed in the LFS, and we build a dummy that takes the value 1 if *i)* the individual is behind and still enrolled in compulsory school or *ii)* he is not enrolled and have not yet completed compulsory school; it takes 0 otherwise.[16] As shown in *Table 1*, about 8 percent of 15-year olds have experienced a school failure in compulsory school.[17] School failures are examined using a logit model whose results are reported in *Table 3*. School variables are included separately in columns (1) to (4), and simultaneously in the last column. In each specification we added regional fixed effects to take into account region-level determinants.

In all the specifications, substantial gender differences arise and, on average, males have twice the probability of being delayed as females. The variables that are closely related to the family background appear to be among the most relevant, highlighting the school system's inability to represent a resource and an opportunity for youngsters coming from less-advantaged families. The cultural capital available inside the family, measured by the parents' schooling, significantly reduces the failure rate for their children; for example, the probability of being held back a year for children of graduated is one-tenth that of the children whose parents have only completed compulsory school.[18] Further, the probability of school failures is correlated with fathers' employment status: it is higher if the father is a blue-collar worker or he has a temporary job.[19] The fact that a mother works, meaning that she is not at home full time, does not appear to either support or justify possible anomalies in the educational paths of

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[16] We consider as school failures also those who leave school without any certificate because *de facto* they have experienced a failure in compulsory school. Those cases are very few and cannot be considered as a further alternative. However, the inclusion of these observations does not affect our results.

[17] An educational path that commits the individual to stay longer in compulsory school has a relevant impact in terms of his future choices. See section 5 for an analysis of the effect of delay encountered in compulsory schooling on future educational choices.

[18] Oreopoulos *et al.* (2006) document the causal relationship between parents' education and school failure risk.

[19] These variables may proxy the low status of the father. In addition, the uncertainty of temporary jobs may translate into inferior scholastic results for the children.

her children. Therefore the social evolution that has characterized the last decades has not entailed any negative impact in the education and development of human capital (Hanushek, 1992).[20] The probability of being behind also increases with the number of siblings because family resources along with parental attention for each child decrease in large families.

The probability of being delayed can also be the result of inefficiencies in the scholastic system, which may fail to provide for the adequate educational development of youngsters due to a lack of resources or low professionalism and commitment level of the teaching staff.[21] The adoption of full time and the fewer teachers with temporary contracts are highly significant variables and are associated with a lower probability of delay. Both variables have a sizeable effect: keeping all the explanatory variables at their mean and moving the incidence of full time from the first quartile to the third quartile (the incidence of temporary contract from the third quartile to the first quartile) nearly halves the probability of delay.

Our interpretation of these findings is that full time helps to fill the gap in those areas where pupils stay behind thanks to the creation of new learning space. It also increases the level of involvement, interaction, and participation by the students in the school activities. Furthermore, full time arises as a substitute for the family's cultural capital: its marginal effect is significantly higher in families where both parents have at most compulsory education than in families where parents are graduated. This confirms the view that full time represents an opportunity to fill educational and cultural gaps, especially for those students who come from less-educated families. As far as the incidence of teachers with temporary contracts is concerned, the negative effect on the regularity of the educational career can be interpreted as a consequence of the lower motivation of the teaching staff, the lesser knowledge of the class and the lack of didactical continuity. On the contrary, the quality of school infrastructures and the pupils-class ratio do not appear to be significant in reducing the school failures.

5. Post-compulsory Educational Choices

Economics is often defined as the theory of choice. The educational choice – the one taken after the completion of compulsory school, which in Italy normally happens at age 14 – represents the first time an individual faces a choice and probably one of the most important decisions he will ever make regarding his educational and professional career. At that age, young individuals choose whether to quit school or to continue with upper secondary school; if the latter is the case, they choose the type of school in which they will enroll. Those who

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[20] The employment status of the mother has an impact that is not predictable ex-ante. The mother's presence at home may imply care and help for the children. However, the participation in the labor market may translate into greater economic stability and more resources to invest in the children's education. In our estimates, the status of the mother is not significant, and we can reasonably affirm that female labor-market participation does not represent a drawback for the children.

[21] Note that having experienced a school failure is not a completely objective measure of student competencies. To be more precise, while inferior teaching by less-motivated teachers is likely to affect the pupils' human capital acquisition, the relationship with the repetition of one year is less clear. A less-motivated teacher may translate into a lower level of learning for students, therefore, a greater probability of experiencing a failure. However, there may be a lower interest by teachers in the students' evaluation and less incentive to let them repeat a year. Therefore some caution is needed in the interpretation of the coefficients due to the nature of the outcome variable.

leave school have on average a lower employment probability and flatter age-earnings profile. Those who continue to study make a decision that in turn strongly affects later transitions.[22]

The dataset is obtained by selecting all the youngsters aged 15-19 who got their license the year before the interview; therefore we include also those who completed compulsory school with a delay and we can assess its impact on future educational choices (see *Table 2*).[23] For clarity of exposition, we discuss separately the determinants of dropout and school choice.

5.1 Early Dropouts

Early dropouts are examined using a logit model. The dependent variable is a dummy that takes the value 1 if the individual dropouts right after compulsory school and 0 if he continues to study. Results are reported in *Table 4*. As above, school variables are included separately in columns (1) to (4), and simultaneously in the last two columns. We also gave more spaces to variables referring to local labor markets to assess their impact on educational outcomes.

The abandonment of the education path is weakly correlated with the parents' education and it is affected by fathers' employment status. In particular, being the son of a blue-collar, of an atypical worker or of an inactive person significantly increases the probability of leaving school early. Gender differences are negligible whereas being first-born significantly decreases the dropout risk. The single most powerful predictor of dropping out is previous school failure (see also Rumberger, 1995; and Jimerson *et al.*, 2002). Those who repeated one year in compulsory school have a probability of dropping out that is 10 times more than those who completed school with no delay. The effect is even stronger for those who repeated 2 year or more in compulsory school. Unfortunately it is not possible to correctly identify the relationship between delay and dropout: the students lagging behind may be less gifted and their future performance may just be a result of their lesser abilities or, alternatively, early school failure may lead to lower self-efficacy and aspirations and, through this channel, lower educational performances.[24] Once we have established the strong correlation between school failure and early dropout, further insights may be drawn from the examination of within-group characteristics of the youngsters who are behind. If we contrast those students who experienced a school failure and dropout with those who experienced a school failure and enroll in upper secondary school, we see that the family background of the groups differs in an appreciable way. The parents of the former have lower educational attainments and occupational status. The marginal effect of delay on dropout is sizeable when both parents have at most compulsory schooling and negligible when they are both graduated.

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[22] According to Cappellari (2005) the type of the secondary school represents one of the most important variables in determining the decision to go to university.

[23] In Checchi and Flabbi (2006) track choices are examined for 15-year olds who are enrolled in upper secondary school. Our data has the advantage of also considering those who do not enrol in upper secondary school or complete compulsory school with a delay, therefore not suffering from potential sample selection biases (see Cameron and Heckman, 1998).

[24] See Eide and Showalter (2001), Manacorda (2006) and Jacob and Lefgren (2007) for a discussion of the relationship between grade failure and future educational outcomes. McElroy (1996) and Bishop and Mane (2001) examine the effects of measures of students' ability on dropout.

Looking at the local variables, we observe that dropout is lower in the more urbanized provinces. On the contrary, there is not any significant relationship with the unemployment rate thus reflecting the uncertainty of its role in affecting dropout behavior. Higher employment probability may convince students to quit school and enter labor market but may also increase expected education returns and thus stimulate the youngsters to acquire further education. Apart from the ambiguity of the relationship between unemployment rate and dropout behavior, another explanation for the non significance of the coefficient is the heterogeneity of individuals. In other terms, aggregate unemployment rates are likely to be little or no concern to those who drop out just because they already found a job. Finally, dropout is positively correlated with the relevance of the industry sector among the economic activities. This result seems to confirm the traditional view of the private industry in Italy that is characterized by "low intensity of education" and by reliance on internal training.

Among the school inputs, full time and better school infrastructures positively affect the probability of staying in school. Both variables have a substantial effect: moving the incidence of full time from the first quartile to the third quartile (the quality of school infrastructure from the third quartile to the first quartile) halves the likelihood of dropout. The widespread adoption of the full-time schooling positively affects the youngsters' cognitive development and human capital acquisition and therefore it should decrease the dropout risk. Poor school infrastructures may hamper youngsters' motivation to study and contribute to the view that the school environment is not an opportunity to grow and learn; they can also approximate the level of spending and care of local authorities. Following the psycho-sociological models pioneered by Tinto (1975), the adoption of full time and better school infrastructures may also improve the person-environment fit, help the students to feel more connected with the educational system, and incentive their enrolment in upper secondary school.

5.2   School choice

Most of the literature has investigated the determinants of the *level* of education achieved whereas the *type* of the education is less explored, thus neglecting its strong influence on later school transition and one's professional career. To address this issue, we examine the school choice of those who continue to study after the completion of compulsory schooling.

School choices are examined using a multinomial logit model. We considered four possible alternatives: LI = enrolled in *licei*, VS = enrolled in vocational schools, TS = enrolled in technical schools, and AT = enrolled in art schools or teaching schools. Under the standard assumptions of a multinomial logit model, the probability of observing alternative j reduces to:

$$P_{i,j} = \frac{e^{X_i'\beta_j}}{\sum_{k=1}^{4} e^{X_i'\beta_k}}$$

where *X* represent the covariates referring to individual *i,* and *β* is a vector of parameters to be estimated and that varies across alternatives *j*. Results are reported in *Table 5*.[25] In order to make "visible" the effect of some explanatory variables of special interest, we report in *Table 6* the probability of educational choices associated with different "typos".[26]

There are substantial gender differences in track choice, and female students are more apt to choose an educational path in the arts, humanities or more academically oriented curricula. In particular, the probability of being enrolled in technical or vocational school is 67 percent for males and 31 percent for females. Conversely, the likelihood of being enrolled in art and teaching school or in the *licei* is much higher for females. The education of both parents is one of the main determinants of the school choice. The probability of a young person choosing vocational or technical schools is more than 60 percent if both parents have only compulsory education, and decreases to 10 percent if they are graduated; in the latter case, the *licei* option is definitely the most likely (nearly 90 percent). The impact of family background on school choice arises also when considering the effect of father's employment status: the son of a blue-collar or self-employed has a greater probability of choosing vocational or technical schools than the son of a white-collar.[27] The impact of family background on children's educational choice may operate through several channels. It may reflect the intergenerational transmission of ability and skills trough both nature and nurture; alternatively it may be related to the transmission of preferences.[28] There may be also a more direct effect whereby parents encourage or coerce children, regardless of their ability and interests. Finally, it may be the result of a rational choice: those who come from a less-advantaged family tend to choose less risky – less difficult or shorter – investment in human capital such as vocational and technical schools that guarantee employability right after the diploma. We are not able to disentangle these channels and our estimated coefficients have to be interpreted as total effect of family background.

Experiencing a school failure also affects the type of school chosen. The probability of being enrolled in vocational school is 9 percent if a young person regularly completed compulsory school, but increases to 37 percent if he accumulated a delay. More generally, about 70 percent of those students who experienced a school failure in compulsory school choose, if they continue to study, a vocational or a technical school.

As far as the labor market variables are concerned, the likelihood of being enrolled in vocational schools (and art and teaching schools) is lower where the unemployment rate is higher. Therefore in depressed labor market, vocational schools do not appear as a profitable investment and youngsters prefer to enroll in *licei*. A higher incidence of the tertiary sector

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[25] The logit probabilities exhibit the Independence from Irrelevant Alternatives property (IIA), which implies that the odds of two alternatives, *j* and *k*, do not depend on the other existing alternatives. The Hausman test does not reject the IIA property, therefore, the multinomial logit may be considered as an appropriate specification for the problem analyzed.

[26] The representative typo is the one with all explanatory variables at their mean. The exercise consists in analyzing how probabilities vary when considering values different from the mean for some of the covariates, thus identifying different typos.

[27] The effects of mother's occupation are considerably weaker than those for father's occupation.

[28] Children assimilate norms and practices associated with different types and levels of education at home, and they may tend to choose the track with which they are most familiar.

among the economic activities is associated with a greater probability of choosing technical or vocational schools. In particular, the presence of services that are less human-capital intensive (wholesale and retail trade, hotels and restaurants, storage and transports, etc.) is correlated with a stronger preference for vocational schools whereas services that are more human-capital intensive (financial intermediation, entrepreneurial activities, etc.) lead to a greater probability of technical schools being chosen.

We repeat the same empirical exercise, using different specifications of the dependent variables, aggregating the school choice in VS & TS and AT & LI where VS & TS stands for vocational and technical schools that are more directly connected with the labor market, and AT & LI stands for art and teaching schools and *licei* that are more academically oriented (see the last column of *Table 5*). Finally, we consider the entire flow sampling of those who got their license the year before the interview thus including also those who decided to not continue to study. In this way we do not have any selection issues that may bias our estimates and we simply add a further alternative (NE that stays for not enrolled) in the multinomial logit model (see *Table 7*). In both cases our results are unaffected and, for brevity, we do not provide any further comments about these.

6.   Concluding Remarks

School failure in compulsory school is widespread, but also surprisingly under-investigated. Post-compulsory educational choices (early dropout and track choices) represent the first circumstance when an individual make a decision and, probably, it is one of the most important he ever makes. To assess the determinants of these phenomena, we built a dataset combining individual data by LFS, aggregate data on the local labor market, and a rich set of variables describing the features of the school system at the local level.

We showed that about 8 percent of 15-year-old Italians have repeated at least one year in compulsory school, and this has important consequences on future choices. We also showed that the school failure risk is strongly conditioned by a young person's economic and cultural background. School fails to fill-up the gaps of those coming from less-advantaged families, whereas initial inequalities are increasingly strengthened with the compelling risk of mistaking privilege with merit in the school environment. The fact that the "social" selection starts at this early age deserves greater attention in the policy debate.

We also examined post-compulsory educational choices of the youngsters in terms of both dropout decision and track choice. Leaving school early, in an economy characterized by technological and productive change in which knowledge and competencies play a key role, may lead to professional and social marginalization. Those who continue to study choose the type of secondary school they will attend, which, in turn, will affect to a large extent their future choices and careers. Both early dropouts and track choices are strongly affected by parents' education and father's occupation, also through the channels of parents' aspirations

and economic resources and their conjectures about children's abilities. Furthermore, the enrollment of less gifted students seems to be one of the main features of vocational schools.

The results of the paper allow us to discuss the effectiveness of the educational system when narrowing failure risk and scholastic outflow and to suggest some policy options. School failures and early dropouts do not seem to be the result of limited resources invested in education; expenditure per primary and secondary student is above the corresponding OECD averages (see OECD, 2006). The pupils-class ratio is not significant in all the specifications examined. On the contrary, promising results arise when considering the functioning of the educational system, how resources are spent and the role of teachers. The adoption of full time reduce both failure and dropout risks. It solves practical problems for those families where both parents work, and it represents an opportunity for the educational development, especially of those who come from a less-advantaged families and with a smaller amount of cultural capital at home. A lower incidence of teachers with temporary contracts plays a significant role in reducing school failures. A higher incidence of temporary contracts necessarily implies more teachers' turnover, lower knowledge of the class and lack of didactical continuity; it can also approximate, given the temporal perspective of the job and the absence of any evaluation mechanism for their activity, the degree of motivation and effort of the teaching staff (see Barbieri *et al.*, 2007). Finally, the quality of school infrastructures contributes significantly to the reduction of early dropouts. Poor school infrastructures may affect the level and quality of the teaching and could consequently create a less than stimulating school environment; they can also approximate the level of spending of local authorities and how much education is evaluated in the local context.

The analysis of the determinants of school failures and dropouts offers also an insight into the results on students' competencies provided by PISA. Italian students are among the lowest achiever in Europe; their results are largely affected by the family background and strong territorial differences arise.[29] However, the target population considered by PISA excludes early leavers and strongly under-represents students who are still enrolled in compulsory school. Since the selected sample of the interviewed, as we have showed above, is strongly related to the family background and to the place of residence, then we expect a downward bias in PISA studies when assessing the influence of family background and the North-South divide in students' competencies.

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[29] See OECD (2006) and, for a discussion of the territorial differences and the role of family background, Bratti *et al.* (2007) and Montanaro (2008).

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Appendix

Table A.1: Participation rates (1)

School year:	15-18 years	15 years
2000/01	78,7	90,1
2001/02	80,5	92,9
2002/03	82,0	94,4
2003/04	83,2	94,7
2004/05	83,6	93,1
2005/06	84,4	93,4

Source: *MPE*.
(1) The participation rate is given by the number of youngsters enrolled at school (any level) per 100 youngsters of the correspondent age.

Table A.2: Distribution of pupils for regularity of education path (1)

School level	Regular	Late
Primary school	91,6	3,1
Lower secondary school	86,0	10,3
Upper secondary school	71,1	24,6

Source: MPE.
(1) Regular students include also those who are ahead of time. School year 2004/05.

Table A.3: Distribution of enrolled in upper secondary school (1)

School type:	
Vocational schools	20,9
Technical schools	36,0
Liceo in humanities	10,0
Liceo in scientific activities	21,4
Art school	3,9
Teaching schools	7,9

Source: MPE.
(1) School year 2004/05.

Table A.4: Data description

Explanatory variables	Description (source)	Mean (std. dev.)
Female	Gender; = 1 if female (*LFS*).	0.47 (0.499)
First born	Birth order; = 1 if first born (*LFS*).	0.54 (0.498)
Parental age	Maximum age between father's and mother's one; age is normalized to child's year of birth (*LFS*).	32.2 (7.157)
Number of siblings	Number of siblings (*LFS*).	2.24 (0.914)
Father's education	Father's years of schooling (*LFS*).	9.18 (4.709)
Mother's education	Mother's years of schooling (*LFS*).	9.83 (4.131)
Father's employment status		
employee	= 1 if senior executive or employee	0.26 (0.437)
blue-collar	= 1 if blue-collar	0.27 (0.444)
self-employee	= 1 if entrepreneur, member of professions or self-employee	0.24 (0.429)
atypical	= 1 if temporary contract	0.04 (0.207)
unemployed	= 1 if looking for a job	0.03 (0.161)
Inactive	= 1 if inactive (*LFS*).	0.08 (0.273)
Mother's employment status		
employee	= 1 if senior executive or employee	0.20 (0.397)
blue-collar	= 1 if blue-collar	0.09 (0.284)
self-employee	= 1 if entrepreneur, member of professions or self-employee	0.08 (0.269)
part-time	= 1 if part-time job	0.16 (0.366)
unemployed	= 1 if looking for a job	0.05 (0.211)
Inactive	= 1 if inactive (*LFS*).	0.43 (0.495)
Metropolis	Degree of urbanization; = 1 if the main municipality of the province has more than 250,000 inhabitants (*Istat*).	0.12 (0.235)
Youth unemployment	Unemployment rate for people in the age bracket 15-24 (*Istat*).	23.2 (12.94)
Industry	Percentage of workers in industry sector (*Istat*).	20.9 (9.007)
Services	Percentage of worker in tertiary sector (*Istat*).	64.3 (7.754)
Low services	Percentage of workers in services that are less human-capital intensive: wholesale and retail trade, hotel and restaurants, garage, storage and transports (*Istat*).	27.2 (4.398)
High services	Percentage of workers in services that are more human-capital intensive: financial intermediation, entrepreneurial activities and other services (*Istat*).	37.1 (5.993)
Pupils-class ratio	Average number of pupils per class (*MPE*).	20.7 (1.169)
Full time	Percentage of students with full time (*MPE*).	29.6 (13.65)
Temporary teachers	Percentage of teachers with temporary contracts (*MPE*).	17.0 (7.239)
Poor school infrastructures	Index built averaging the percentages of schools with buildings unfit to school, those improperly adapted to teaching activity, and those with poor maintenance of floors, heating systems, wirings, bathroom fixtures and fittings (*MPE*).	30.3 (14.29)

Note: the descriptive statistics of the individual and family background variables refer to the sample of 15-year olds used in section 4. Variables on features of the educational system refer to lower secondary education. All local variables are at a province level.

Figure A.1: The quality of school infrastructures across provinces
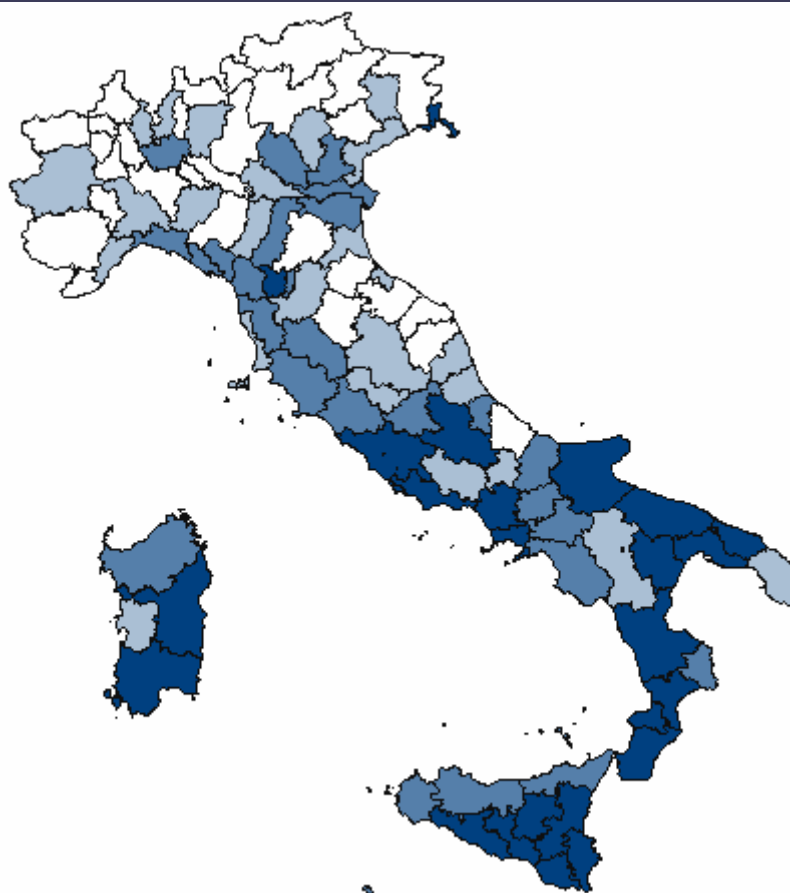
(1) The Index that measures the quality of school infrastructures is built averaging the percentages of schools with buildings unfit to school, of those improperly adapted to teaching activity, and of those with poor maintenance of floors, heating systems, wirings, bathroom fixtures and fittings. Provinces are divided in quartiles according to the index: those with a lighter blue have better school infrastructures with respect to the others, and viceversa.

Regression tables

Table 3: The determinants of school failures

	(1)	(2)	(3)	(4)	(5)
Female	-0.321**	-0.326**	-0.313**	-0.306**	-0.342***
	(0.126)	*(0.128)*	*(0.124)*	*(0.123)*	*(0.129)*
First born	0.014	0.032	0.006	0.013	0.018
	(0.114)	*(0.114)*	*(0.112)*	*(0.113)*	*(0.112)*
Parental age	-0.032***	-0.030**	-0.030***	-0.028**	-0.032***
	(0.012)	*(0.012)*	*(0.012)*	*(0.012)*	*(0.012)*
Number of siblings	0.200***	0.181**	0.185***	0.192***	0.182**
	(0.075)	*(0.076)*	*(0.071)*	*(0.072)*	*(0.076)*
Father's education	-0.061**	-0.056**	-0.061**	-0.061**	-0.059**
	(0.026)	*(0.025)*	*(0.025)*	*(0.025)*	*(0.025)*
Mother's education	-0.048*	-0.054*	-0.049*	-0.049*	-0.051*
	(0.029)	*(0.028)*	*(0.028)*	*(0.028)*	*(0.028)*
Father's employment status:	*Reference category: employee*				
Blue collar	0.336*	0.356*	0.319*	0.328*	0.335*
	(0.195)	*(0.194)*	*(0.189)*	*(0.189)*	*(0.196)*
Self-employee	0.189	0.223	0.194	0.207	0.185
	(0.181)	*(0.185)*	*(0.178)*	*(0.179)*	*(0.183)*
Atypical	0.553**	0.555**	0.504**	0.516**	0.568**
	(0.249)	*(0.250)*	*(0.248)*	*(0.246)*	*(0.247)*
Unemployed	0.391	0.381	0.387	0.402	0.380
	(0.300)	*(0.297)*	*(0.288)*	*(0.292)*	*(0.300)*
Inactive	0.249	0.277	0.262	0.259	0.261
	(0.266)	*(0.266)*	*(0.260)*	*(0.261)*	*(0.265)*
Mother's employment status:	*Reference category: employee*				
Blue collar	0.184	0.191	0.182	0.179	0.184
	(0.313)	*(0.307)*	*(0.301)*	*(0.300)*	*(0.312)*
Self-employee	-0.652*	-0.633	-0.651*	-0.630*	-0.697*
	(0.383)	*(0.391)*	*(0.377)*	*(0.375)*	*(0.390)*
Part time	0.046	0.070	0.048	0.051	0.053
	(0.219)	*(0.220)*	*(0.215)*	*(0.215)*	*(0.218)*
Unemployed	0.511*	0.471	0.462	0.453	0.509*
	(0.307)	*(0.309)*	*(0.305)*	*(0.305)*	*(0.309)*
Inactive	-0.045	-0.037	-0.037	-0.048	-0.031
	(0.228)	*(0.225)*	*(0.219)*	*(0.220)*	*(0.224)*
Metropolis	-0.114	0.060	0.092	0.042	0.035
	(0.144)	*(0.143)*	*(0.178)*	*(0.158)*	*(0.176)*
Youth unemployment	0.011	0.017	0.016	0.014	0.014
	(0.013)	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*
Full time	-0.019***				-0.018**
	(0.007)				*(0.007)*
Temporary teachers		0.031**			0.031**
		(0.015)			*(0.015)*
Poor school infrastructures			-0.015		-0.011
			(0.017)		*(0.015)*
Pupils-class ratio				-0.031	-0.019
				(0.109)	*(0.106)*
Year dummies	YES	YES	YES	YES	YES
Regional fixed effects	YES	YES	YES	YES	YES
Observations	1.684	1.684	1.804	1.829	1.684

The sample includes all 15-year olds who were interviewed during the first half of the year and who had birthday before the interview. The dependent variable in the logit model is: 1 = school failure (still enrolled in compulsory school or not enrolled without completion of compulsory school); 0 = otherwise. See table 1 in the text. The number of observations changes across specification because some school variables are not available for all provinces. Cluster adjusted standard errors in parentheses; *, **, *** significantly different from zero at the 10, 5 and 1 percent level, respectively.

Table 4: The determinants of early dropouts

	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.220 *(0.155)*	0.224 *(0.150)*	0.254 *(0.152)*	0.240 *(0.148)*	0.251 *(0.165)*	0.240 *(0.160)*
First born	-0.373** *(0.169)*	-0.341** *(0.168)*	-0.342** *(0.167)*	-0.341** *(0.167)*	-0.415** *(0.175)*	-0.413** *(0.180)*
Delay 1 year	0.943*** *(0.243)*	0.914*** *(0.237)*	0.938*** *(0.239)*	0.923*** *(0.242)*	1.025*** *(0.241)*	0.998*** *(0.250)*
Delay 2 years or more	2.234*** *(0.423)*	2.243*** *(0.419)*	2.366*** *(0.415)*	2.354*** *(0.389)*	2.313*** *(0.434)*	2.364*** *(0.442)*
Parental age	0.006 *(0.018)*	0.004 *(0.018)*	0.001 *(0.017)*	0.003 *(0.017)*	0.005 *(0.018)*	0.004 *(0.017)*
Number of siblings	-0.069 *(0.122)*	-0.079 *(0.121)*	-0.030 *(0.112)*	-0.039 *(0.114)*	-0.043 *(0.119)*	-0.039 *(0.121)*
Father's education	-0.054 *(0.038)*	-0.047 *(0.038)*	-0.056* *(0.033)*	-0.053* *(0.032)*	-0.063* *(0.037)*	-0.062* *(0.037)*
Mother's education	-0.030 *(0.027)*	-0.036 *(0.028)*	-0.039 *(0.029)*	-0.037 *(0.028)*	-0.027 *(0.029)*	-0.028 *(0.029)*
Father's employment status:	*Reference category: employee*					
Blue collar	0.477** *(0.237)*	0.403* *(0.239)*	0.341 *(0.248)*	0.316 *(0.230)*	0.414* *(0.245)*	0.428* *(0.248)*
Self-employee	0.180 *(0.304)*	0.127 *(0.287)*	0.218 *(0.279)*	0.134 *(0.267)*	0.196 *(0.315)*	0.210 *(0.312)*
Atypical	1.173*** *(0.339)*	1.076*** *(0.326)*	1.098*** *(0.336)*	1.045*** *(0.319)*	1.143*** *(0.349)*	1.185*** *(0.346)*
Unemployed	0.610 *(0.406)*	0.579 *(0.395)*	0.567 *(0.431)*	0.459 *(0.414)*	0.530 *(0.435)*	0.577 *(0.441)*
Inactive	1.107*** *(0.329)*	1.022*** *(0.326)*	1.003*** *(0.330)*	0.968*** *(0.313)*	1.034*** *(0.334)*	1.063*** *(0.337)*
Mother's employment status:	*Reference category: employee*					
Blue collar	0.246 *(0.303)*	0.283 *(0.301)*	0.238 *(0.303)*	0.250 *(0.297)*	0.203 *(0.310)*	0.247 *(0.304)*
Self-employee	0.357 *(0.363)*	0.368 *(0.371)*	0.472 *(0.360)*	0.477 *(0.349)*	0.380 *(0.370)*	0.439 *(0.361)*
Part time	0.056 *(0.332)*	0.114 *(0.330)*	0.182 *(0.321)*	0.165 *(0.316)*	0.037 *(0.335)*	0.119 *(0.326)*
Unemployed	0.126 *(0.299)*	0.168 *(0.302)*	0.136 *(0.303)*	0.169 *(0.295)*	0.125 *(0.308)*	0.165 *(0.308)*
Inactive	0.033 *(0.317)*	0.094 *(0.322)*	0.034 *(0.314)*	0.074 *(0.309)*	-0.016 *(0.317)*	-0.003 *(0.308)*
Metropolis	-0.479** *(0.200)*	-0.309* *(0.179)*	-0.548*** *(0.211)*	-0.382** *(0.187)*	-0.819*** *(0.268)*	-0.557** *(0.292)*
Youth unemployment	0.023* *(0.013)*	0.018 *(0.012)*	-0.001 *(0.015)*	0.013 *(0.014)*	0.012 *(0.015)*	0.001 *(0.016)*
Industry	0.040*** *(0.016)*	0.034** *(0.015)*	0.023 *(0.016)*	0.015 *(0.015)*	0.046*** *(0.017)*	
Services						-0.027* *(0.015)*
Full time	-0.020*** *(0.007)*				-0.021*** *(0.007)*	-0.019*** *(0.007)*
Temporary teachers		-0.006 *(0.016)*			-0.007 *(0.017)*	-0.003 *(0.016)*
Poor school infrastructures			0.021** *(0.008)*		0.027*** *(0.009)*	0.025*** *(0.009)*
Pupils-class ratio				0.122 *(0.077)*	0.067 *(0.079)*	0.119 *(0.075)*
Year dummies	YES	YES	YES	YES	YES	YES
Area fixed effects	YES	YES	YES	YES	YES	YES
Observations	1.412	1.412	1.525	1.547	1.412	1.412

The sample includes all the youngsters who complete compulsory school the year before the interview; they were interviewed during the first half of the year and had birthday before the interview. The dependent variable in the logit model is: 1 = early dropout (not enrolled after the completion of compulsory school); 0 = otherwise. See table 2 in the text. The number of observations changes across specification because some school variables are not available for all provinces. Area fixed effects include: North West, North East, Centre, South and Islands. Cluster adjusted standard errors in parentheses; *, **, *** significantly different from zero at the 10, 5 and 1 percent level, respectively.

Table 5: The determinants of school choice after compulsory schooling

| | Ref. category = LI | | | Ref. category = LI & AT |
	VS	TS	AT	VS & TS
Female	-1.110***	-1.522***	1.032***	-1.656***
	(5.83)	*(8.64)*	*(3.33)*	*(10.55)*
First born	-0.115	-0.048	0.100	-0.099
	(0.42)	*(0.27)*	*(0.35)*	*(0.66)*
Delay 1 year	1.962**	-0.166	-0.658	1.104*
	(2.56)	*(0.23)*	*(0.70)*	*(1.85)*
Delay 2 years or more	4.469***	3.568***	-31.630***	4.134***
	(5.30)	*(4.00)*	*(38.05)*	*(4.54)*
Parental age	-0.051**	-0.031*	-0.045*	-0.026
	(2.21)	*(1.73)*	*(1.65)*	*(1.52)*
Number of siblings	0.283*	0.235	0.345*	0.145
	(1.75)	*(1.61)*	*(1.95)*	*(1.18)*
Father's education	-0.142**	-0.061*	-0.050	-0.070**
	(2.45)	*(1.74)*	*(0.99)*	*(2.20)*
Mother's education	-0.278***	-0.200***	-0.105**	-0.200***
	(5.36)	*(5.42)*	*(2.26)*	*(5.85)*
Father's employment status:	*Reference category: employee*			
Blue collar	0.729**	0.701**	0.487	0.603**
	(2.07)	*(2.14)*	*(1.41)*	*(2.43)*
Self-employee	0.498	0.418	0.270	0.382*
	(1.45)	*(1.62)*	*(0.93)*	*(1.77)*
Atypical	0.787	0.290	0.101	0.408
	(1.12)	*(0.63)*	*(0.21)*	*(0.92)*
Unemployed	0.135	0.060	0.089	0.059
	(0.15)	*(0.09)*	*(0.11)*	*(0.11)*
Inactive	0.739	0.708**	-0.577	0.778**
	(1.49)	*(2.01)*	*(0.90)*	*(2.27)*
Mother's employment status:	*Reference category: employee*			
Blue collar	0.591	0.239	0.341	0.302
	(1.59)	*(0.59)*	*(0.88)*	*(0.96)*
Self-employee	-0.024	0.231	-0.192	0.215
	(0.05)	*(0.69)*	*(0.34)*	*(0.61)*
Part time	-0.036	-0.151	0.036	-0.089
	(0.11)	*(0.47)*	*(0.10)*	*(0.33)*
Unemployed	0.193	0.942**	1.206**	0.424
	(0.33)	*(1.98)*	*(2.32)*	*(1.15)*
Inactive	0.052	0.159	0.269	0.082
	(0.13)	*(0.53)*	*(0.80)*	*(0.28)*
Metropolis	-0.263	-0.818**	0.727	-0.587**
	(0.58)	*(2.30)*	*(1.29)*	*(2.07)*
Youth unemployment	-0.060***	-0.004	-0.069***	-0.005
	(2.60)	*(0.23)*	*(2.61)*	*(0.40)*
High services	0.034	0.079***	-0.035	
	(1.18)	*(3.64)*	*(0.97)*	
Low services	0.067***	0.027	0.044	
	(2.85)	*(0.86)*	*(1.50)*	
Services				0.053***
				(3.53)
Year dummies		YES		YES
Regional fixed effects		YES		YES
Hausman Test	*for IIA*	*for IIA*	*for IIA*	-
Observations		1.470		1.470

The sample includes all the youngsters who complete compulsory school the year before the interview; they were interviewed during the first half of the year and had birthday before the interview. The alternatives in multinomial logit model are: VS = enrolled in vocational schools; TS = enrolled in technical schools; AT = enrolled in art and teaching schools; and LI = enrolled in *licei* (reference category). See table 2 in the text. The Hausman test of IIA assumption is repeated eliminating the alternatives in each column; "for IIA" means that the test does not reject that this property, implied by the MNL model, is valid. Standard errors are clustered at the province level; robust z statistics in parentheses; *, **, *** significantly different from zero at the 10, 5 and 1 percent level, respectively.

Table 6: Probability of educational choices associated with different typos (1)

	Vocational school	Technical school	Liceo	Art or teaching school
Percentages predicted by the model	10,2	39,1	46,0	4,7
Female	7,5	23,2	59,0	10,3
Parents with compulsory education	16,1	46,4	33,0	4,5
Parents with a university degree	0,7	9,1	87,7	2,6
Blue-collar father	13,1	47,9	34,0	5,0
Delay in compulsory school	36,6	33,5	28,3	1,6

(1) Explanatory variables are considered at their mean value, if not otherwise specified. See regression in *Table 5*.

Table 7: The determinants of educational choice after compulsory schooling

| | Reference category = LI | | | |
	NE	VS	TS	AT
Female	0.066	-1.069***	-1.496***	1.035***
	(0.19)	*(5.65)*	*(8.53)*	*(3.32)*
First born	-0.769**	-0.136	-0.054	0.114
	(2.10)	*(0.50)*	*(0.32)*	*(0.39)*
Delay 1 year	2.710***	2.164***	-0.064	-0.617
	(3.70)	*(3.14)*	*(0.10)*	*(0.68)*
Delay 2 years or more	7.886***	4.286***	3.194***	-40.241***
	(7.32)	*(4.85)*	*(3.20)*	*(52.15)*
Parental age	-0.019	-0.044*	-0.029	-0.047*
	(0.38)	*(1.93)*	*(1.59)*	*(1.82)*
Number of siblings	0.134	0.249	0.220	0.321*
	(0.42)	*(1.53)*	*(1.52)*	*(1.82)*
Father's education	-0.181*	-0.144***	-0.066*	-0.040
	(1.81)	*(2.61)*	*(1.88)*	*(0.86)*
Mother's education	-0.228***	-0.282***	-0.194***	-0.108**
	(3.07)	*(5.92)*	*(5.36)*	*(2.31)*
Father's employment status:	*Reference category: employee*			
Blue collar	1.313**	0.714**	0.672**	0.503
	(2.22)	*(2.03)*	*(2.03)*	*(1.45)*
Self-employee	0.621	0.515	0.412	0.261
	(0.96)	*(1.52)*	*(1.59)*	*(0.91)*
Atypical	2.694***	0.836	0.287	0.050
	(3.62)	*(1.34)*	*(0.64)*	*(0.10)*
Unemployed	1.490	0.279	0.155	0.157
	(1.36)	*(0.33)*	*(0.22)*	*(0.20)*
Inactive	2.731***	0.704	0.737**	-0.476
	(3.63)	*(1.42)*	*(2.18)*	*(0.76)*
Mother's employment status:	*Reference category: employee*			
Blue collar	1.172*	0.523	0.231	0.339
	(1.81)	*(1.42)*	*(0.57)*	*(0.90)*
Self-employee	1.177	-0.114	0.245	-0.193
	(1.48)	*(0.23)*	*(0.74)*	*(0.34)*
Part time	0.555	-0.077	-0.136	0.050
	(0.79)	*(0.23)*	*(0.42)*	*(0.15)*
Unemployed	1.237	0.054	0.913*	1.192**
	(1.60)	*(0.09)*	*(1.92)*	*(2.30)*
Inactive	0.400	0.039	0.195	0.266
	(0.51)	*(0.10)*	*(0.66)*	*(0.82)*
Metropolis	-1.408*	-0.264	-0.829**	0.715
	(1.73)	*(0.58)*	*(2.35)*	*(1.27)*
Youth unemployment	-0.035	-0.057***	-0.003	-0.070***
	(1.01)	*(2.61)*	*(0.21)*	*(2.62)*
High services	0.073	0.031	0.079***	-0.036
	(1.29)	*(1.11)*	*(3.70)*	*(0.98)*
Low services	-0.018	0.059**	0.020	0.042
	(0.27)	*(2.53)*	*(0.65)*	*(1.45)*
Year dummies	YES			
Regional fixed effects	YES			
Hausman Test	*for IIA*	*for IIA*	*for IIA*	*for IIA*
Observations	1.547			

The sample includes all the youngsters who complete compulsory school the year before the interview; they were interviewed during the first half of the year and had birthday before the interview. The alternatives in multinomial logit model are: NE = not enrolled; VS = enrolled in vocational schools; TS = enrolled in technical schools; AT = enrolled in art and teaching schools; and LI = enrolled in *licei* (reference category). See table 2 in the text. The Hausman test of IIA assumption is repeated eliminating the alternatives in each column; "for IIA" means that the test does not reject that this property, implied by the MNL model, is valid. Standard errors are clustered at the province level; robust z statistics in parentheses; *, **, *** significantly different from zero at the 10, 5 and 1 percent level, respectively.

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