Does elapsed time to degree affect labor market success?

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(Preliminary version)

Abstract

By using university administrative and survey data on Italian graduates drawn from the Almalaurea Consortium, we analyze their early labor market outcomes. We assess the effect of elapsed time to degree, separately from other attributes, such as having worked during university and having obtained top marks. The estimates deal with potential endogeneity issue of the delay and are ran using several specifications of the delay (continuous variable vs dummies variables). Estimates, as robustness checks, are also ran by group of field of study, separately. The results suggest that one additional year of delay lowers the likelihood to find a job of about 1.24% and of about 1%, three years and five years from graduation, respectively. However, the penalization emerges only for the delays beyond two years. Having worked during university increases the probability of being employed only in the beginning as after five years the effect disappears. No effects are found for the final grade. Finally, regressions by field of study confirm the negative impact of delay on finding a job, but it emerges that a larger penalization is associated to graduates with a degree in liberal arts and socio-economics rather than in engineering.

Keywords: time-to-degree, university, labor market transition.

JEL codes: I20, J24.

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1. Introduction

Over the recent years, several countries have experienced an increasing amount of university students completing the studies not at the expected age with the direct effect of postponing entry in the labor market.[1] This can be due to the decision either to spend more years (than the minimum period required) in tertiary education or to take gap years. Regardless of the reasons, this fact may lowering the returns from human capital investment as well as reducing the benefits associated to education. To judge whether this behavior can negatively affect the success in the labor market and whether policy interventions are required, we need to study the consequences of such specific trait of college graduates once out of the educational system.

Most of the empirical evidence has focused on the determinants of elapsed time to degree (Aina *et al*., 2011; Bound *et al*., 2012; Lassibille and Navarro Gomez, 2010) but very few contributions analyzed the labor market effects of delayed graduation (Holmlund *et al.*, 2008; Taniguchi, 2005; Monks, 1997). We add to this literature on elapsed time to degree by focusing on the effect of postponing the labor market entry and assessing whether there is a mix of personal characteristics and experiences gained during academic years that can nullify any potential penalties associated to delayed graduation. Final grade, field of study, time to degree and previous work experiences are what distinguish a university graduate from the others and, in a context of asymmetric information, an employer can use the aforementioned attributes to select candidates. We focus both on parental and academic characteristics, especially on the number of years spent at university beyond the legal duration to investigate the impact of this trait on the probability of finding a job over time, namely one year, three years and five years from graduation. The labor market success can operate through several channels, which include the subject studied, the final grade, the timing, the job preferences and the area of residence/studying. The aim is to test whether delayed graduation is, *ceteris paribus*, a key variable in explaining the different performance of graduates in the labor market. By using rich administrative data on university students linked with surveys data that cover the whole population of graduates in 2002 and 2003 in 22 Italian Public Universities (see details on AlmaLaurea data in Section 4), we are able to:

- provide estimates about the transition from university to labor market;
- evaluate whether the effect of delay penalizes the labor market success over time;
- assess the effect of elapsed time to degree separately from other attributes, such as having worked during university and having obtained top marks.

[1] Spending further years in tertiary degree program than the years required is becoming common in university systems where students have the possibility of freely determining the length of their studies, for instance US, France, German, Denmark, Sweden, Italy (OECD, 2014).

We find that postponing graduation has a negative and persistent effect on the probability of getting a job, especially for students with a degree in liberal arts. In particular, estimates show that one additional year of delay lowers the likelihood to find a job of about 1.24% and of about 1%, three years and five years from graduation, respectively. However, the penalization emerges only for the delays beyond two years. While having worked during university increases the probability of being employed only in the beginning as after five years the effect disappears. No effects are found for the final grade.

The remaining of the paper is organized as follows. Section 2 summarizes the literature related to our research. Section 3 provides some institutional details on the educational system in Italy. We then move to describe our data and our empirical strategy and results in Section 4 and 5. Finally, Section 6 summarizes our main findings and conclusions.

2. Literature review

To justify the differences in the economic returns from tertiary education investment a large body of empirical literature has appeared. Well-established findings seemed to support the theory suggested by the rational-behavioural model, i.e. people acquire more education only if their lifetime earnings expectations increase (Becker, 1964; Card 1995, 2001; Heckman and Honoré, 1990; Manski, 1990). Overall, individuals that are more educated have better job opportunities, lower probability of being unemployed and higher earnings, hence a person decides to invest in education because of the greater expected monetary and non-monetary returns. Higher earnings prospects are the most obvious benefit and the consensus estimate is that the return to education is quite substantial. Recent researches, mainly using US data, indicate that an additional year of schooling typically raises an individual's earnings power (Trostel *et al.*, 2002). In general it has been estimate that four years of college education in US raise earnings by about 65% (a return of about 13% compounded) (Card and Krueguer, 1992). To identify the variation in the earnings across people, several features have been exploited. For instance, a large body of studies have analyzed the link between the labor market outcomes and family background, confirming that children's outcomes are highly correlated with parents' characteristics, especially with their level of education (Card, 1999). Then, since Tinto (1973), it has been shown a positive association between college proximity and college going. Chiefly, individuals with financial constraints and/or lower returns' expectations from the labor market benefit more from universities availability in the area of residence (Lauer, 2002). Some others researchers have focused on the role of community colleges, especially in the US, finding that students from lower-income benefit more from this type of institutions because of their difficulties in collecting money for universities. In addition, community college have had the merit of increasing

the aggregate educational attainment and of improving the labor market conditions - especially in terms of higher wages – of those individuals who would otherwise have not attended tertiary education (Kane and Rouse, 1999; Mykerezi *et al.*, 2009).

Additional sources of heterogeneity in terms of returns to education are school quality and ability, the latter measured by IQ or aptitude test and final grade (Welch, 1973; Checchi, 2000). Differences in earnings between workers by level of education (Buchinsky, 2001), gender (Blau and Kahn, 2000; 2005; Dolton and Makepeace, 1986) and ethnicity (Blau and Kahn, 1992; Altonji and Blank, 1999) have been investigated, too.

Other researches, instead, look at the differences in earnings across fields of study (Berger, 1988; Daymont and Andrisani, 1984; Paglin and Rufolo, 1990; Blundell *et al*., 2000; Loury, 1997; Bonanno and Pozzoli, 2009). While a convincing body of evidence examines the differences in earnings due to over-education, suggesting that individuals who are over-educated for their job are paid more than those who are correctly qualified, but less than individuals who have found the perfect match in the labor market (Hartog, 2000; Duncan and Hoffmann, 1981). Finally, there are several contributions on the "sheepskin effect", i.e. the existence of wage premiums related to credentials rather than the years of schooling achieved. In these contributions, the diverse income performance obtained in the labor market by individuals is explained looking at the type of diploma/degree achieved rather than the years spent in formal education (Brunello *et al*., 2000; Belman and Heywood, 1991).

Nevertheless, despite the growing proportion of university students that complete studies well beyond the minimum period required, evidence about timing of graduation and the effect on individuals' earnings are definitely scarce. For instance, Monks (1997) finds a negative correlation between age at graduation and entry-level wage, and this penalty is persistent over the entire work career since individuals are not able to fill the gap. Taniguchi (2005), still for US, obtains similar results. In particular, he finds that a graduation not at the expected time, regardless the motivations, entails a lower starting salary which prevents individuals from catching up good starters. While for Sweden, Holmlund et al. (2008) show that two years of delay in graduation reduce the lifetime earnings, explaining that this penalization is partly due to lower investments in post-tertiary education made by graduates who completed studies not at the expected age. Finally, although for the high school students, Brodaty *et al.*, (2013) show that, during the early work career, each additional academic year spent obtaining a high school degree entails a reduction in earnings of about 9% over the entire work career.

3. The Italian tertiary education system

In Italy, all students with a high school diploma (i.e. an upper secondary qualification, which is usually completed at age 19) can enrol in a university. High school diplomas can be academic (*licei classici* and *licei scientifici*) or vocational (*istituti tecnici* and *istituti professionali*) and both types of diplomas give access to any university degree.

The Italian university system traditionally includes only academic degrees with little vocational or professional purposes and with an official duration, which varies between 4 and 6 years. This university system has been changed in 2001 by a reform that split the long degrees into two levels, an initial three-year degree called *Laurea Breve* (Honour Degree) followed by a two-year degree course called *Laurea Magistralis* (Master degree). Our sample includes only graduates in 2002 and 2003 who are unaffected by the 2001 reform because they all began their degree in the pre-reform period.

Most of the Italian Universities are public and, with the exceptions of few types of faculties, such as Medical Schools, there are no university admission exams. There is no official limit to the number of years a student can be enrolled in a degree programme before completing it. This is because progression from one year to another is generally not conditional on past performance, and, if students fail an exam or are unhappy with the mark obtained, they can re-sit the exam several times. Consequently, students usually take much longer than the minimum official period to complete their degree. Four-year degrees are usually completed in an average of 7.5 years, with only one in eight students completing within 4 years (ISTAT, 2000). The university degree has a legal value regardless the institution and the subject chosen, hence individuals satisfying two requirements, such as being graduate with a final grade above 105[2], can take part to open competitive exam for state level employment. Then it becomes clear the trade-off tackles by undergraduates, namely graduation on time or with top marks.

Financial aid for university students is limited[3], but public university fees are very low because mainly state funded. Nevertheless, there is a clear socio-economic gradient in university enrolment. Children with low income or low educated parents usually choose a secondary qualification, which is vocational and are unlikely to enrol in a university (Checchi *et al*., 1999). This gap in the university enrolment is in part explained by the lack of vocational degrees and is one of the main factors

[2] In Italian tertiary education system, the final grade ranges from a minimum of 66 to a maximum of 110 cum laude.

[3] In 2000 only 12% of students received a public university grant (Fondazione RUI and Università di Camerino 2002).

explaining the strong intergenerational correlation in educational attainment in Italy (Hanushek and Wößmann, 2006; Brunello and Checchi, 2007). The introduction of the 2001 university reform seems to have increased the university enrolment especially for children with good educational results at the completion of secondary education and with parents with low level of education (Cappellari and Lucifora, 2009).

4. Data

In our empirical exercise, we use AlmaLaurea data. AlmaLaurea is a consortium of Italian Universities whose aim is providing employers with information on graduates. From 1994 onward, it has been running surveys for each cohort of graduates from the universities belonging to the consortium. Graduates are interviewed at the completion of their degree (Profilo dei Laureati survey), and they are followed and interviewed again after 1, 3 and 5 years from the degree (Condizione Occupazionale dei Laureati survey). All interviews are computer assisted telephone interviews administered by trained interviewers.

Information from the four interviews are matched with students' details contained in the administrative data registers of each university. Consequently, for each cohort of graduates AlmaLaurea collects information on age, sex, area of residence, family background (e.g. parents' occupation and education), timing of graduation, educational choices and final grade pre and during university, labor market status during and after the university, and occupational characteristics and income bracket after graduation.

The initial survey at the completion of the degree covers almost the whole population of new graduates from the Universities belonging to the AlmaLaurea consortium. The response rates in these initial surveys are usually well above 90%. Looking at the interviews at 5 years after the degree the responding people still represent more than 80% of the population of graduates who answered to the initial interviews.

4.1 Sample

Our main sample is reduced to a balanced panel of graduates in 2002 and 2003 (i.e. graduates who are interviewed three times after degree). We include all universities and departments belonging to the Consortium in 2002 or 2003 except for Medical Departments, the LUMSA (Libera Università Maria Santissima Assunta) and the IULM (Istituto Universitario di Lingue Moderne)[4]. The universities included in our sample of graduates are the following 24: University of Bari, Bologna,

[4] LUMSA and IULM are private universities hence graduates from these institutions have been excluded for selecting a sample with homogenous characteristics. Accordingly, graduates in Medicine have been not included because of their well-defined career path.

Cassino, Catania, Catanzaro, Chieti, Ferrara, Firenze, Genova, Messina, Modena and Reggio Emilia, Molise, Basilicata, Padova, Parma, Piemonte Orientale, Sassari, Siena, Torino Politecnico, Torino, Trento, Trieste, Udine, and Venezia Architecture. We drop from our sample all students that are older than 35 at the completion of their degree and those who keep working for the same employers after graduation. This selection is driven by the heterogeneity of these individuals. In fact, either they cannot be likened to those who have never worked or to those who used to work in a different firm. Finally, we exclude those graduates who are not working and are not seeking a job. By and large, these graduates are still involved in some education (master, Ph.D), are completing an internship program (necessary to become lawyer or a business consultant, for instance), or are studying for a qualifying examination.

Our final sample of graduates includes 13,620 people, interviewed 1, 3 and 5 years from degree.

4.2 Variables definitions

4.2.1 Dependent Variable

We consider as dependent variables the dummy taking value 1 for graduates who are working, and 0 for those who are unemployed. Table 1 shows the probability of being employed by the years of delay beyond the legal duration (i.e. 0, 1, 2. 3 or more) over the three interviews. It appears that graduates are more likely to be employed has time passes by and when they got a degree within the minimum period prescribed.

4.2.2 Explanatory Variables

The explanatory variables used in our analysis include observable characteristics at the start and at the completion of the university degree.

The characteristics we consider at the start of the university are: gender; high school final mark, which ranges between 36 and 60; high school type, i.e. a dummy variable taking value 1 for academic high schools (*licei classici* and *licei scientifici*) and 0 for vocational high schools (*istituti tecnici* and *istituti professionali*); a set of dummy variables to distinguish between the level of education of parents: who got a university degree and high school diploma.

The characteristics at the completion of the university that we control for are: a set of dummy variables for the type of degree; the dummies for the university of graduation, the final university grade standardized at department level by using all the observations available in the main sample; a set of dummy variables for having graduated with 1, 2, 3 or more years of delay, where the delay is computed as additional number of years spent to get a degree beyond the minimum period; having worked during university.

Table 2 summarizes the explanatory variables of graduates. We report mean and standard deviation for each explanatory variable using our main sample of 13,620 graduates. The average high school final grade is about 49 (out of 60 maximum points) and two in three individuals has an academic diploma. More than 50% of the fathers have either a university degree or a high school diploma, while only 48% of the mothers. About 62% of graduates worked during the university while only 16.8% took part to the Erasmus program. The average years of delay are 2.4, but with a large standard deviation (2.1). As shown in figure 1, only 4% of graduates complete their studies within the legal length and about 21% got a degree with 1 year of delay, while 22.5% and 17.4% graduated with 2 and 3 years of delay, respectively. About 29% spent between 3 and 6 years more than the duration required, and more than 7% spent up to 11 years.

5. Empirical strategy and results

The empirical setup is simple as we estimate the probability to be employed after 1, 3 or 5 years from graduation, running a probit regression of the following equation:

$$Employed_i = \alpha + \beta x_i + \delta * Delay_i + \varepsilon_i \qquad (1)$$

where $Employed_i$ is an indicator that takes the value of one if the individual is employed, zero otherwise; x is the set of regressors illustrated in the previous section which will be progressively enriched, as explained below.

Estimated specifications include only covariates measured at the graduation date, so we do not take account of potentially endogenous events occurred from graduation to the moment of the interview. To control for unobserved heterogeneity across individuals, we use standard proxies for their ability. Although we do not have a direct measure of graduates' ability, we can rely on a wide range of information on graduates' educational achievements both before and after the university enrolment. We include a dummy for the high school type and for the corresponding leaving grade. An additional well-known indirect measure of individuals' ability is parents' educational background, which is included in the estimates. All individuals in the sample completed tertiary education; thus they are homogeneous in terms of the achieved educational level[5]. However, they differ in terms of field of study in which they graduated. We control for both these aspects. Geographical area dummies (for the North-East, Centre and South of Italy) are finally included in order to take account of local labour market fixed effects and of potential heterogeneous quality of university institution over the country.

[5] They are not perfectly homogeneous in terms of years of schooling as there are some degrees (for instance engineering) with a duration of five years.

The focus of our analysis is on the effect of the *delay* to complete graduation on the probability to be employed. In the first specification (Table 3) we use a continuous measure of *delay*. Accordingly, the variable is measured in years, months and days since the end of the last graduation session in which the students can graduate "on time"[6].

One concern is the potential endogeneity of the delay: if the ability of the students is not adequately controlled for, and if ability and the time needed to graduate are correlated, the resulting estimates are biased and inconsistent. With this in mind, we have explored several potential instruments that mainly should affect the timing of graduation without having a direct effect on the probability to be employed after graduation[7]. Among these instruments, two (which are strictly correlated) emerged as particularly promising. The potential instruments are the variations - between the first and the third year of enrolment of each student - of the employment and unemployment rates in Italy. According to the literature on the determinants of the time to degree, labour market conditions are among the main candidates to explain students' performance in terms of timing of graduation, beside students' ability and university resources. It has been shown that poor labor prospects are a disincentive to graduate within the minimum time (Brunello and Winter-Ebmer, 2003; Aina *et al*., 2011): in a context of low tuition fees, university can be seen as a 'parking lot' (Becker, 2001), where 'staying put' is advantageous compared with potentially unsuccessful job searches. According to this evidence, we assume that an improvement in labour market conditions during the first years of the academic career could encourage students, *ceteris paribus*, to graduate as fast as possible to take advantage of the good labour market opportunities. Conversely, if the unemployment rate is rising, students could decide to stay longer at university to avoid entering the labour market at a bad time, with potential negative consequences for their future career. Considering that the dataset used in the analysis is an outflow sample collecting information on graduates in the same years (2002 and 2003), the observed individuals enrolled for the first time at university in different years, precisely from 1986 to 1999, which provides enough variability to our instruments.

Both instruments predict well the delay[8], with the expected signs (positive and negative for the unemployment and employment rate variation, respectively) and both are not significant in the employment probability equations, once controlled for the delay, but only in the sample after three and five years from graduation[9]. However, once instrumented the delay with the employment and

[6] In Italy, students can graduate since the summer session of their last year of enrollment. However, up to the following spring session (which generally ends in the month of April) they are still considered as graduates "on time" (*in corso*).

[7] The fact that our covariate of interest (delay) is constant, as it is measured at the moment of graduation, does not allow us to exploit the panel nature of our dataset to run a fixed effect model.

[8] Following the Staiger and Stock's (1997) rule of thumb which suggests that the instruments are weak if the F-test for their inclusion in the auxiliary regression is lower than 10, the estimates show that the chosen instruments are never week.

[9] We speculate that after only one year from graduation the economic cycle, which leads to a certain variation in the labour market conditions in the first years of enrollment is not yet concluded, and can thus directly affect graduates'

unemployment variations (one by one), both the Wald test after the probit estimation and the Durbin and Wu-Hausman (Wu, 1974; Hausman, 1978) test after the linear model estimation failed to reject the null hypothesis of exogeneity of the delay[10]. Given these checks, we run the probit regression directly on the equation (1) for the sample interviewed after three and five years from graduation.

As explained above, the academic career of students enrolled in the same field differentiate not only in terms of their times-to-degree, but also in terms of their leaving grade and of the working experiences they eventually made at university. Both the decisions to get the top marks and to work while studying may have consequences on the time needed to graduate. Students who aim to graduate with a high final mark, which can be required to get a job in the public sector, may decide to take longer time to graduate[11]. Likewise, those who have a job while studying may take longer to graduate as they cannot devote all their time to the study. On the other hand, especially if the working activities are somehow related with the field of study, it can provide students with some practical experience that can be positively evaluated by future employers (Light, 2001; Hakkinen, 2006). Since these features of each student's academic career are probably highly correlated with the time needed to graduate, we investigate their direct and interacted (with the variable *delay*) effects on the probability to be employed.

Several estimates are not very informative and serve mainly to confirm the results well-established in the literature. Therefore, we only show the results which deserve greater interpretation efforts. For covariates which do not represent the main focus of our analysis we provide a joint comment on the results of all the specifications. According to the marginal effect estimates reported in Table 2, female's employment probability is slightly lower than that of males. As expected, all employment outcomes indicators are worse for graduates in universities located in the centre and south of Italy. Poorer labor market conditions in those areas, together with the low willingness to mobility of Italian graduates are probably among the determinants of such result. Study achievements prior to university as well as parents' background are not related to graduates' employment outcomes, as they affect the field chosen at university, and the corresponding leaving grade. Concerning the type of course of study, estimates show that only graduates in engineering have better performances in all indicators than the reference group, represented by graduates in business and economics. It has to be noted that engineering has a degree organized in five years of study and the majority of subjects has scientific contents. It is not surprising that, as argued by the human capital theory according to which wages

employment outcomes. This probability decreases as the time elapses and this explains why after three and five years the direct effect does not emerge anymore.

[10] All the estimations are available upon request.

[11] Delayed graduation does not penalize at all those who participate to public competition. On the opposite, it is often required a minimum leaving grade.

depend on the accumulation of human capital (Becker, 1964), graduates in engineering face also a larger probability of finding a job.

Concerning the main focus of our analysis, namely the influence of the time to degree and of other university experiences potentially correlated with it, we find that the delay has the most persistent effect on the probability to be employed. One additional year of delay lowers this probability by 1.24% and by 0.09, after three and five years from graduation, respectively. The university leaving grade does not affect the employment probability: this result is not surprising as those with higher leaving grade could be more selective when they receive a job offer. Having had working experiences during university increases the probability to be employed, but only in the short run, as after five years from graduation this effect disappears. In addition, the interaction between the delay and previous work experience is statistically significant and positive, thus suggesting that the acquired work experience may compensate the negative effect of the delayed graduation. However, since there can be a selection bias in work experience acquisition at university as well (Hakkinen, 2004), we can only conclude from our analysis that the negative effect of the delay persists even after controlling for working experiences.

Even if we control for the field of study in which students graduate, there can still be a lot of heterogeneity in the ability or in other unobserved individual characteristics, which are not controlled for in our specification and can shape the relation between the delay and the probability to be enrolled. In order to reduce this heterogeneity, we run equation (1) by macro-field of degree (Table 4). We distinguish four macro-fields: "socio-economic", which includes the degrees in Economics, Business, Statistics, Law, Sociology and Political Science; "liberal arts", which includes the degrees in Literature, History, Philosophy, Foreign Languages and Psychology, "engineering-architecture", which includes the degrees in all the branches of Engineering and Architecture[12]. About the variable of interest, we find that the coefficient of the delay is always negative and statistically significant, but the effects are quite heterogeneous. Entering in the labour market with a delay is more penalizing for those holding a "liberal arts" or a "socio-economic" degree, while it has almost no effect for those holding a degree in Engineering or Architecture. Quite interestingly, the other two features of the academic career that can differentiate the graduates' *curriculum vitae* (i.e. the leaving grade and the job experiences while studying) are almost never significant.

Assuming that there is a monotonic linear relationship between the delay in graduation and the probability to be employed is, however, debatable. Since in Italy less than 5% of the students

[12] There is also a "scientific" macro-field, which includes degrees in Mathematics, Physics, Biology, Chemistry and Pharmacy. However, given the small numbers of graduates in this field (around 900, less than 7% of the sample) we have omitted the corresponding estimation.

graduated on time, and more than 50% graduated with more than two years of delay, employers could consider as "normal" to graduate with some years of delay and not penalize the *curricula* of graduates with such delays. In order to allow for non-parametric effects of delay on the employment probabilities we estimate a third specification on the whole sample where the delay in graduation is grouped in four classes:

$$Employed_i = \alpha + \beta x_i + \delta_1 * Delay2_i + \delta_2 * Delay3_i + \delta_3 * Delay4_3 + \varepsilon_i \qquad (2)$$

where $Delay_2$ is a dummy which assumes the value one for a delay from 1 to 2 years, $Delay_3$ for a delay from 2 to 4 years and finally $Delay_4$ for a delay longer than 4 years (the reference category is represented from graduates with a delay up to one year). We have instrumented our three potentially endogenous dummies with four variables: the variation of the employment (unemployment) rates between the first and the third year of enrolment at university, and the interactions between this variable and three dummies for students enrolled in a "liberal arts", scientific or engineering field (the remaining group being represented by those enrolled in a "socio-economic" field). As above, according to an ordered probit estimate of the ordered dummies of the delay, the instruments predict well the different delays[13]. Moreover, their coefficients are not statistically significant once added in the equation (2). However, as before, both the Wald tests after the probit estimation and the Durbin and Wu-Hausman (Wu, 1974; Hausman 1978) test after the linear model estimation failed again to reject the null of exogeneity of the delay. We then ran our estimation on the equation (2) without instrumenting the delay dummies (Table 5)[14].

Results confirm our hypothesis: the effect of the delay cannot be fully captured by the continuous variable. A delay up to two years does not entail any penalization in terms of probability to work. A delay ranging from 2 to 4 years reduces the probability of being employed after three years from graduation by 3.1%. Finally, a delay of more than 4 years reduces this probability by more than 6.5%. The penalization of longer delay (over 2 years) persist even after five years from graduation, when the overall probability to be employed is 93%.

6. Concluding remarks

The Italian University system is homogeneous, given that all universities provide the same type of degrees. Despite the autonomy granted to each university, the curricula of the different degree programs must comply national rules in terms of number and type of exams to be passed. Moreover,

[13] Again, as above, Following the Staiger and Stock's (1997) rule of thumb the estimates show that the chosen instruments are never week.

[14] We report only the results of the variables of interest. All the usual controls have been however included in the estimates.

at least from a normative point of view, degrees in the same field have the same value for access to the labour market, independently from the university that issued the degree.

University students can however differentiate their *curricula studiorum* in several ways, in order to improve their employment chances. They can try to get the top final grade to signal to the potential employers their theoretical grounding. They can accumulate work experiences while studying to signal their practical abilities. Finally, they can graduate on time to prove their organizational ability. Students may however overestimate (underestimate) the positive (negative) effects that such signals have in the labour market.

This study estimates the impact of the time-to-degree on graduates' early career outcomes, once controlled for the other features that can differentiate graduates' *curricula*. We find that postponing graduation has a negative and persistent effect on the probability of getting a job, especially for students with a degree in liberal arts. However, since the average time to degree in Italy is far beyond the prescribed duration of the degree programs, the labour market begins to penalize non-regular students only after two years of delay, i.e. when the effective duration of their studies is at least 50% longer than the prescribed duration. Having had work experiences during university can mitigate the negative effect of the delay, while a top leaving grade does not.

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Tables and figures

Table 1 – Percentage of graduates employed by years of delay over time

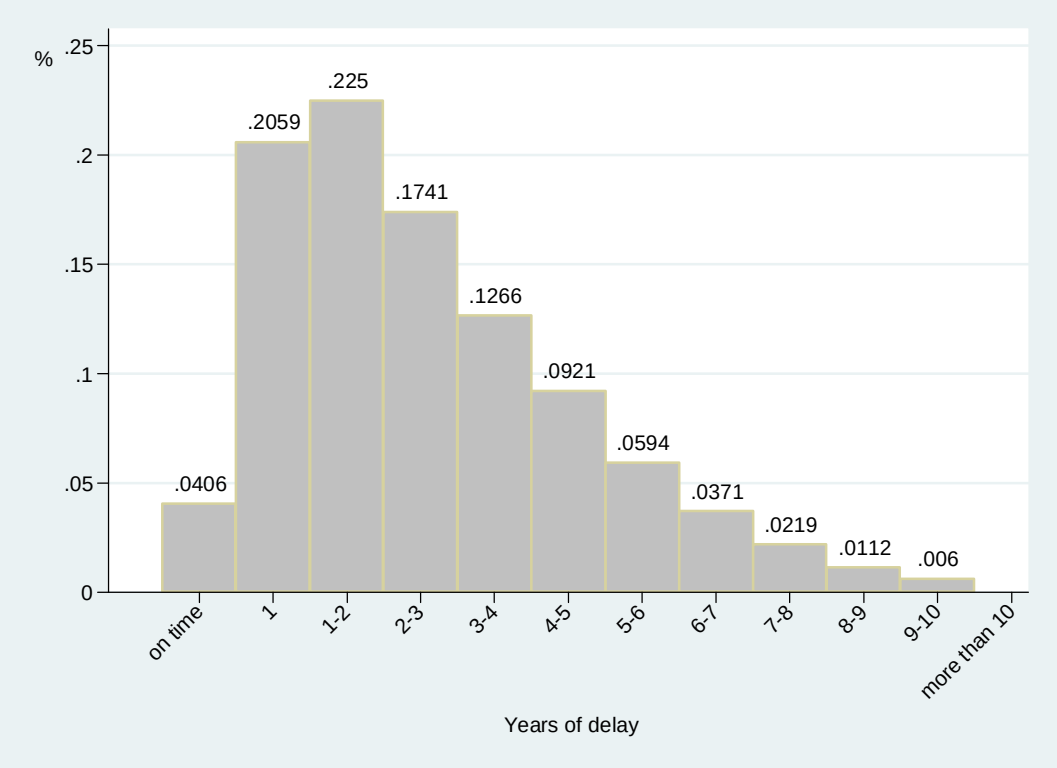
Interview	Years of delay			
	0	1	2	3 or more
1 year from graduation	71.23	67.29	64.60	60.61
3 years from graduation	90.73	88.67	85.22	81.52
5 years from graduation	95.23	94.35	92.35	90.07
N. observations	3,335	3,063	4,093	3,171

Source: Own elaboration on AlmaLaurea data

Table 2- Summary statistics of explanatory variables

Variable	Mean	Std. Dev
Females	0.588	
Academic high school diploma	0.686	
High school final grade	48.65	7.061
Parents' education		
Father with a university degree	0.168	
Father with a high school degree	0.343	
Mother with a university degree	0.136	
Mother with a high school degree	0.342	
Field of Study		
Agricultural	0.034	
Architecture	0.050	
Pharmacy	0.054	
Engineer	0.163	
Political Science	0.085	
Psychology	0.047	
Mathematics and Physics	0.070	
Modern Literature and Philosophy	0.214	
Law	0.093	
Top final grade (110 cum laude)	0.1809	
Having worked during university	0.621	
Erasmus experience	0.168	
Geographical area of study		
North-East	0.445	
Centre	0.117	
South	0.244	
Years of delay	2.355	2.098
N. observations	13,620	

Figure 1 – Distribution of years of delay



Source: Own elaboration on AlmaLaurea data

Table 3 - Estimates of the probability to be employed. Specification with continuous delay. All sample.

	(1) 3 years from grad.	(2) 5 years from grad.
Female	-0.0280***	-0.0290***
	(0.00640)	(0.00512)
Academic high school (Licei)	0.0124**	0.0114**
	(0.00626)	(0.00475)
High school final grade	0.000584	0.00130***
	(0.000433)	(0.000335)
Father with uni degree	0.00563	0.00268
	(0.00967)	(0.00752)
Mother with uni degree	-0.0152	-0.00714
	(0.0101)	(0.00784)
Father with high school deg.	0.0117*	0.00540
	(0.00691)	(0.00533)
Mother with high school deg.	0.0127*	0.00959*
	(0.00696)	(0.00539)
Agricultural	-0.00871	-0.0124
	(0.0159)	(0.0125)
Pharmacy	0.0701***	0.0245**
	(0.0154)	(0.0121)
Architecture	0.0736***	0.0140
	(0.0165)	(0.0122)
Engineer	0.120***	0.0448***
	(0.0135)	(0.0109)
Political Science	-0.0242**	-0.0210**
	(0.0114)	(0.00896)
Psychology	-0.0507***	-0.0514***
	(0.0143)	(0.0108)
Maths & Phisics	-0.0259**	-0.0299***
	(0.0114)	(0.00887)
Modern literature	-0.0418***	-0.0357***
	(0.00907)	(0.00712)
Law	-0.103***	-0.0314***
	(0.00956)	(0.00784)
Area of study: North-East	-0.00432	0.00398
	(0.00881)	(0.00691)
Area of study: Centre	-0.0571***	-0.0227***
	(0.0108)	(0.00846)
Area of study: South	-0.137***	-0.0755***
	(0.00883)	(0.00697)
Top fin. grade at univ. (110 cum laude)	0.0151	0.00200
	(0.0103)	(0.00800)
Job during uni	0.0230***	0.00431
	(0.00873)	(0.00680)
Erasmus experience	0.0282***	0.00870
	(0.00805)	(0.00611)
Delay (continuous)	-0.0124***	-0.00860***
	(0.00217)	(0.00161)
Delay* top marks uni	-0.00164	0.000981
	(0.00364)	(0.00281)
Delay* job during uni	0.00602**	0.00534***
	(0.00256)	(0.00192)

N. observations	13,620	13,620

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 - Estimates of the probability to be employed. Specification with continuous delay. Sample split by macro-field of study.

	(1) SE-fields/3 years from grad.	(2) SE-fields/5 years from grad.	(3) LA-fields/3 years from grad.	(4) LA-fields/5 years from grad.	(5) EA-fields/3 years from grad.	(6) EA-fields/5 years from grad.
Female	-0.0479***	-0.0338***	0.0375*	0.00626	-0.0159**	-0.0161***
	(0.0107)	(0.00783)	(0.0202)	(0.0172)	(0.00697)	(0.00546)
Academic high sch.	0.0514***	0.0142*	0.0186	0.0238**	0.0101	0.0134**
	(0.0113)	(0.00806)	(0.0143)	(0.0119)	(0.00834)	(0.00615)
High school final gr.	0.00213***	0.00135**	-0.000462	0.00211**	-0.000175	0.000347
	(0.000793)	(0.000566)	(0.00107)	(0.000888)	(0.000502)	(0.000397)
Father univ. degr.	-0.00692	-0.00833	0.0151	0.00780	-0.00713	0.00139
	(0.0175)	(0.0126)	(0.0246)	(0.0207)	(0.0105)	(0.00849)
Mother univ. degr.	-0.0161	-0.00819	-0.0576**	0.00182	-0.00516	0.00176
	(0.0186)	(0.0133)	(0.0252)	(0.0217)	(0.0114)	(0.00907)
Father high sch. degr.	0.0207	0.00391	0.00205	0.00886	0.00900	0.000270
	(0.0128)	(0.00918)	(0.0172)	(0.0142)	(0.00830)	(0.00608)
Mother high sch. degr.	0.0156	0.0102	0.0111	0.0183	0.00517	0.00282
	(0.0129)	(0.00933)	(0.0172)	(0.0142)	(0.00827)	(0.00619)
Area of study: NE	-0.0136	-0.00725	-0.00887	0.0117	0.0105	0.00701
	(0.0173)	(0.0134)	(0.0238)	(0.0197)	(0.00765)	(0.00582)
Area of study: Centre	-0.0970***	-0.0423***	-0.0934***	-0.0427*	0.0122	0.0124
	(0.0202)	(0.0154)	(0.0278)	(0.0230)	(0.0108)	(0.00875)
Area of study: South	-0.218***	-0.103***	-0.181***	-0.0992***	-0.0160	0.00215
	(0.0164)	(0.0129)	(0.0231)	(0.0191)	(0.00997)	(0.00843)
Top fin. grade at univ. (110 cum laude)	0.0483**	0.0328*	0.0126	0.00175	-0.00948	-0.0175
	(0.0219)	(0.0172)	(0.0226)	(0.0189)	(0.0148)	(0.0109)
Job during univ.	0.0180	0.00825	0.0489**	0.0284	0.00698	-0.0143
	(0.0167)	(0.0122)	(0.0217)	(0.0180)	(0.0110)	(0.00890)
Erasmus exp.	0.0509***	0.0120	0.0293*	0.0145	0.0104	-0.00620
	(0.0155)	(0.0112)	(0.0163)	(0.0137)	(0.0107)	(0.00677)
Delay (continuous)	-0.0168***	-0.0109***	-0.0206***	-0.00977**	-0.00565**	-0.00474**
	(0.00386)	(0.00255)	(0.00596)	(0.00478)	(0.00235)	(0.00198)
Delay* top mark uni	-0.0112	-0.00225	0.00780	0.00145	0.00301	0.00469
	(0.00756)	(0.00568)	(0.00786)	(0.00656)	(0.00484)	(0.00398)
Delay* job during uni	0.0118**	0.00709**	0.00645	0.00612	-0.00183	0.00197
	(0.00462)	(0.00314)	(0.00697)	(0.00568)	(0.00269)	(0.00215)
N.observations	5,017	5,017	2,916	2,916	2,895	2,895

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: SE(Socio-Economic)field corresponds to the degrees in Economics, Business, Statistics, Law, Sociology and Political Science; LA (Liberal Arts) field corresponds to the degrees in Literature, History, Philosophy, Foreign Languages and Psychology; EA(Engineering-Architecture) field corresponds to the degrees in all the branches of Engineering and Architecture

Table 5 - Estimates of the probability to be employed. Specification with the dummies for the delay. Only the dummies for the delay reported. All sample.

	3 years from grad.	5 years from grad.
Delay2: from 1 to 2 years	-0.00502	-0.00421
	(0.0140)	(0.0113)
Delay3: from 2 to 4 years	-0.0318**	-0.0222**
	(0.0127)	(0.0100)
Delay4: more than 4 years	-0.0655***	-0.0523***
	(0.0137)	(0.0105)
Delay2* job univ	-0.00815	-0.00468
	(0.0172)	(0.0136)
Delay3* job univ	-0.00425	0.00734
	(0.0156)	(0.0121)
Delay4* job univ	0.0305*	0.0337***
	(0.0163)	(0.0125)
Delay2* top mark	0.000664	0.0102
	(0.0193)	(0.0153)
Delay3* top mark	0.0215	-0.00693
	(0.0193)	(0.0144)
Delay4* top mark	-0.0268	0.00549
	(0.0217)	(0.0168)
N. observations	13,620	13,620

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1