CESifo Economic Studies, Vol. 54, 2/2008, 149–176, doi:10.1093/cesifo/ifn011

Differential Grading Standards and University Funding: Evidence from Italy

Manuel Bagues*, Mauro Sylos Labini† and Natalia Zinovyeva‡

Abstract

This article documents that grades vary significantly across Italian public universities and degrees. We provide evidence suggesting that these differences reflect the heterogeneity of grading standards. A straightforward implication of this result is that university funding schemes based on students' academic performance do not necessary favour universities that generate higher value added. We test this for the case of the Italian funds allocation system, which rewards universities according to the number of exams passed by their students. We find that university departments that rank higher according to this indicator actually tend to be significantly worse in terms of their graduates' performance in the labour market. (JEL codes: I2, J31, J64)

Keywords: Higher education, grading standards.

1 Introduction

In a number of European countries—including Italy, Spain and France—university grading standards are presumed to be similar across institutions. This presumption justifies the legal value that is typically given to university titles and explains why public funding of universities is increasingly related to the number of diplomas or grade points assigned by universities.

This article empirically investigates the existence of differences in grades and grading standards across Italian universities. It exploits three editions of a survey run on a representative sample of Italian graduates. The survey contains information about graduates' academic and labour market performance, as well as a large set of individual characteristics, including high-school grade, province of origin and various measures of family background. Conditional on this extensive set of controls, we find that

* Universidad Carlos III, e-mail: mfbagues@emp.uc3m.es
† IMT Lucca Institute for Advanced Studies, e-mail: m.syloslabini@imtlucca.it
‡ BETA at University of Strasbourg and FEDEA, e-mail: nzinovyeva@fedea.es
We would like to thank Stijn Kelchtermans, Reinhilde Veugelers and participants at seminars at the Université Louis Pasteur, Sant' Anna School of Advance Studies, 2nd EIASM workshop on Process of Reform of University Systems, XXII Jornadas de Economia Industrial, University of Alicante, the V Brucchi Luchino workshop and the CESifo Workshop on Innovation and Higher Education for their comments on an earlier draft of this article. The empirical analysis of this article would not have been possible without the data and the help provided by ISTAT (the Italian Statistical Office). The econometric analysis was carried out at the ADELE Laboratory in Rome.

grades vary considerably across universities and disciplines. Evidence from graduates' labour market performance and post-university external professional qualification exams (''abilitazione professionale'') suggests that these variations in grades do actually reflect differences in grading standards and not true changes in students' quality. Indeed, we find a significant negative correlation between departments' average grades and the labour market outcomes of their graduates, i.e. graduating from a high grading department leads to a higher unemployment probability and lower wages. As well, graduates from departments with high average grades do not have higher chances to get professional qualifications in external examinations.

A straightforward policy implication follows from the above results. Policy makers should be very cautious about using students' academic performance as a proxy for university value added. If, as shown in this article, grading standards vary significantly across departments and universities, rewarding universities with high graduating rates may lead to undesirable consequences.

We test the relevance of this hypothesis using the main output variable that the Italian government takes into account in order to finance universities: the number of full-time equivalent students (FTE), which measures the number of exams that students have passed in a given year. Consistently with our predictions, we find that graduates from universities with a relatively higher number of FTE perform significantly worse in the labour market and do not obtain better results in professional qualification exams. The evidence thus suggests that a financing scheme which is meant to reward those universities that produce higher value added is, instead, favouring those universities with lower standards.

The rest of the article is organized as follows. Section 2 presents the existent literature on grading standards. Section 3 describes the data and the main variables used in the empirical part. Section 4 presents the empirical analysis and discusses policy implications. Finally, Section 5 summarizes the main results and provides the conclusions.

2 Background

The issue of educational standards has been widely discussed in the economics literature both from a theoretical and an empirical perspective. Grading standards may vary over time and across higher education institutions for a number of reasons. Standards may adjust to the quality of students (Strenta and Elliott 1987). As well, professors may inflate grades to escape negative evaluations by students, whose opinions matter for tenure and promotion decisions (Siegfried and Fels 1979; Nelson and

Lynch 1984). Some departments may also increase their grades to fill poorly attended courses that might otherwise be canceled (Dickson 1984; Staples 1998). In addition, Freeman (1999) argues that given the institutional constraints that prevent, within each university, a system of flexible money pricing for those courses with different expected earnings, instructors and departments may act strategically to manage enrolment by adjusting the time and the effort cost of achieving a given grade. More generally, Costrell (1994) notes that if institutions choose grading standards in a decentralized way a free rider problem may arise, as high standards might not be fully appropriated by each institution. De Paola and Scoppa (2007) point out that, in a decentralized setting, educational standards might be also influenced by the existence of labour market distorsions.

An extensive empirical literature has documented the existence of variations in grades over time across American universities and colleges. In particular, there has been, at least since the 1960s, an increase in the grades issued by American universities, coupled with the perception of a deterioration in academic standards (Kolevzon 1981; Sabot and Wakeman-Linn 1991; Anglin and Meng 2000). As well, there exists a line of studies, which provide evidence on divergence in grades across different disciplines (Dickson 1984; Sabot and Wakeman-Linn 1991; Freeman 1999). For instance, Sabot and Wakeman-Linn (1991) report average grades received by students in several disciplines in eight American colleges and universities, finding a clear division of colleges into high and low grading departments.

Differences in grades are also observed in Europe. A report on the development of exam grades in Germany finds that the average grades vary widely across universities (Wissenschaftsrat 2004). Several authors also observe that in the UK degree results vary according to institution. For example, Chapman (1997) studies the degree results from 1973 to 1993 for eight disciplines and finds a clear tendency for certain universities to award consistently higher percentages of top degrees in all disciplines with respect to the corresponding national average. As far as Italy is concerned, Boero et al. (2001) report that grades tend to vary significantly across degrees and regions.

Unfortunately, in most of these studies it is difficult to disentangle whether the observed differences in grades reflect different qualifications and performance or, conversely, differences in teaching and assessment practices. As Boero et al. (2001) put it, whether the observed differences "indicate use of differential standards across the different institutions or genuine institutional differences in value-added cannot be identified from the data" (Boero et al. 2001, p. 27). However, assessing whether the observed heterogeneity in grades stems form different grading standards or from differences in graduates' true performance might be important for

a number of reasons. Both in Europe and in the US, variations in grading standards might be problematic in the presence of informational asymmetries about the quality of graduates and/or institutions. Most importantly, in many European countries the institutional design of higher education typically requires the homogeneity of grading standards across institutions. This assumption explains why titles have a legal value and are legally required for many occupations and, as well, why several countries, such as Italy and Denmark, have adopted output funding schemes based on the number of diplomas or grade points each higher education institutions delivers.

3 Data

We investigate the potential existence of differences in grading standards across Italian universities and fields of studies using a very detailed dataset concerning Italian university graduates, which allows to observe their socioeconomic background, high-school grades, university performance and, finally, their outcomes in the labour market and in professional qualification exams.

More specifically, our main data are drawn from three distinct but almost identical surveys named Indagine Inserimento Professionale Laureati (Survey on University-to-Work Transition) run in 1998, 2001 and 2004 on individuals that graduated in 1995, 1998 and 2001, respectively.[1]

The target samples consist of 25,716 individuals in 1998, 36,373 individuals in 2001 and 38,470 individuals in 2004. They represent respectively the 25, 28.1 and 24.7 percent of the total population of university graduates in Italian universities. The response rates were of 64.7, 53.3, and 67.6 percent for a total of 17,326, 20,844 and 26,006 respondents. In all 3 years, the sample is stratified according to sex, university and obtained degree and in the analysis below all estimations are performed using stratification weights. We exclude from the sample graduates from physical education studies and from the so-called ''laurea primo livello'', since they were surveyed only in the 2001 edition (501 and 475 observations, respectively).

As other European continental countries, Italy has a system of open admission into public universities: most departments are obliged to admit every applicant, without being allowed to set up any entry restrictions.

[1] Differences may stem from the different interviewing technologies used in the surveys: in 1998 ISTAT mailed paper-based questionnaires, while in 2001 and 2004 graduates were first contacted by mail and then questions were asked following the so-called CATI. (Computer-assisted telephone interview) technique.

This system is common to all public universities and all disciplines except medicine, veterinary and architecture. For a number of reasons, grading standards are likely to be different in those universities and fields of study that can select their students; thus, we further restrict our sample to those departments that cannot select students. This reduces the total size of the sample to 61,844 observations.

The surveys provide information on (i) individual characteristics that are pre-determined with respect to college choices and outcomes, (ii) college-related individual indicators and (iii) labour market outcomes. The first set of variables includes information on the individual sociodemographic background such as gender, nationality, number of siblings, province of residence before college enrolment, parents' education and employment when respondent was around 14-years old, the situation of military service obligations before attending university and self-reported high-school curricula–high-school grade and type of school attended. The second includes university-related indicators: the type of degree and university attended, educational outcomes—i.e. final grade obtained and the number of years spent for the completion of the degree[2]—and additional information such as occupational status during studies, changes in the degree followed, attainment of an other degree and whether the respondent originated from a town or province other than the one where her university was located. Official grades range from 66 points to a maximum of 110 e lode. Third, the survey collects self-reported information about a number of occupational outcomes 3 years after graduation. Among others, it is possible to observe whether the graduate is employed, whether the job requires a university degree, her wage and several indexes of job satisfaction. Table 1 depicts descriptive statistics for the key individual variables.[3]

In addition to the individual information, we use data on several college characteristics. Fields of study are aggregated in 12 different

[2] In Italy, the final grade is calculated as the sum of the grades obtained by the graduate during her courses plus the grade received for the so-called degree dissertation (*tesi di laurea*). Any student whose final grade is higher than 110 obtains what is known as ''110 e lode''. For simplicity, in the empirical analysis reported bellow the potential existence of grades above 110 has been disregarded. The results obtained using a tobit regression, available upon request, are very similar to the ones reported here. Also, note that in the Italian education system in the analysed period students were not constrained either in time or in the number of trials taken for passing exams.

[3] The unemployment rate for graduates in our sample is 14.7 percent. It is consistent with the OECD 2003 data suggesting that 13.6 percent of Italian graduates aged 25–29 not being in education are unemployed. Italian graduates experience disadvantage in terms of early performance in the labour market as the overall unemployment rate among individuals aged 25–29 is 10.4 percent (OECD, Education at a Glance 2005).

Table 1 Descriptive statistics—individual characteristics

	Mean	Min	Max
Pre-determined Individual Characteristics			
Gender (share of females)	0.532	0	1
Age	27.587	21	75
When an individual was 14-years old his father was			
Working	0.960	0	1
Looking for a job	0.004	0	1
A pensioner	0.017	0	1
Other	0.019	0	1
When an individual was 14-years old his mother was			
Working	0.494	0	1
Looking for a job	0.004	0	1
A pensioner	0.020	0	1
Other	0.482	0	1
When an individual was 14-years old his father's highest educational title was			
Elementary license or none	0.190	0	1
Secondary education license	0.236	0	1
Higher education diploma	0.340	0	1
University degree	0.226	0	1
No answer	0.008	0	1
When an individual was 14-years old his mother's highest educational title was			
Elementary license or none	0.250	0	1
Secondary education license	0.259	0	1
Higher education diploma	0.350	0	1
University degree	0.135	0	1
No answer	0.006	0	1
Father's sector of work			
Agriculture	0.050	0	1
Industry	0.260	0	1
Services	0.672	0	1
No answer	0.018	0	1
Number of siblings	1.313	0	4
Nationality			
Italian	0.991	0	1
European Union	0.006	0	1
Extra-communitarian	0.003	0	1

(continued)

Table 1 Continued

	Mean	Min	Max
Type of high school			
Scientific lyceum	0.413	0	1
Classic lyceum	0.193	0	1
Technical industrial institute	0.062	0	1
Technical institute for geometers	0.034	0	1
Technical commercial institute	0.128	0	1
Other type of technical institute	0.030	0	1
Teachers school or institute	0.062	0	1
Language lyceum	0.036	0	1
Professional institute	0.029	0	1
Art lyceum or institute	0.013	0	1
High-school grade	49.085	36	60
Military service obligations			
Exempt	0.219	0	1
Before university	0.039	0	1
Other	0.742	0	1
College-related individual characteristics			
Number of extra years taken to graduate after the end of the official program duration*	2	0	4
University grade	103.628	66	110
Moved from other course	0.107	0	1
Second degree	0.014	0	1
Studied in the region of birth	0.793	0	1
Studied in the province of birth	0.519	0	1
Studied in the town of birth	0.412	0	1
Moved from own town to study	0.300	0	1
Graduates' post-graduation performance			
Passed profession qualification exam	0.452	0	1
In the labour force	0.843	0	1
Employed if in the labour force	0.853	0	1
Employed in a job for fulfilling of which the obtained university degree is necessary if in the labour force	0.644	0	1
Wage**	1135.786	77.468	10 000

Notes: The number of observations is 61,844. *In this case the median value is reported instead of the mean. Value 4 means that 4 or more extra years to graduate have been employed. **The number of observations with non-missing wage is 37,552.

Table 2 Descriptive statistics—department characteristics

	Year	Mean	Std. Dev.	Min	Max
Full-time equivalent (FTE) Students (%)	1995	46.394	12.748	13.118	94.608
University ordinary financial funds*	1995, 1998, 2001	188.982	186.856	11.3	1186.1
Professor per student ratio**	1996, 1999	0.093	0.101	0.004	1.429

Notes: In 2001, there were 410 different departments. *In this case the statistics are reported at the university level in billions of lire. Note that the ordinary financial funds are only available for public universities. **This is the ratio of the number of professors to the total number of non-delayed students.

disciplines.[4] Table 2 displays descriptive statistics at the department level on the share of full-time equivalent (FTE) Students—the main measure used by the Ministry for distribution of ordinary financial funds across universities—and ordinary financial funds themselves.[5] Finally, we also consider a number of demographic and economic indicators at the provincial level such as gross domestic product (GDP), total population and unemployment.

4 Empirical analysis

To begin with, we investigate whether grades vary significantly across disciplines and universities. Then, we analyse whether the potential existence of differences in grades across institutions stems from differences in grading standards or, rather, it reflects genuine differences in institutional value added. Finally, we analyse how the existence of differential grading standards affects the funding of Italian universities.

4.1 Grades

The grades obtained by a university graduate are likely to be related to a number of personal characteristics including parental background and pre-university ability. We estimate the following model:

$$G_i = \beta X_i + \gamma D_f + \delta D_u + \alpha_t + \varepsilon_{itfu}, \quad (1)$$

[4] The *aggregated disciplines* are Agriculture, Architecture, Chemistry and Pharmacy, Economics and Statistics, Engineering, Law, Literature, Medicine and Surgery, Pedagogy, Political and Sociological Studies, Sciences, Veterinary. In what follows the term *department* stands for the corresponding disciplinary unit within a particular university.

[5] Information on the number of FTEs comes from the Osservatorio per la valutazione del sistema universitario (1998). See Perotti (2002) for detailed information on how the number of FTEs affects universities' funding.

where G_i is a measure of the academic results obtained by individual i and X_i is a set of individual characteristics, as described in Table 1, including dummies for the province where the individual lived before attending university and gdp and unemployment rates at the provincial level. D_f and D_u are the sets of dummies corresponding, respectively, to the field of study (or discipline) and university. The time dummy α controls general changes across time. Finally, the error term ε_{itfu} captures any remaining factor affecting academic performance.

Column 1 of Table 3 shows the results of an ordinary least square (OLS) estimation of Equation (1) where the dependent variable is the final aggregate grade obtained by the individual during her studies. In addition to individual pre-determined characteristics, the regression also controls for the number of extra years taken to graduate.[6] The effect of individual characteristics is largely consistent with those obtained by previous studies.[7] We also observe that grades are positively correlated with unemployment rates. This is consistent with the work of Dornbusch et al. (2000) and Di Pietro (2006), who point out that local labour market conditions may influence students' decisions. Lower unemployment rate may encourage a number of students to devote less effort to studying in university, in order to take advantage of the improved labor market conditions.

Moreover, grades tend to vary to a large extent both across universities and across faculties.[8] Figure 1 shows the set of estimated university dummy coefficients, i.e. the component of an individual's grade that is statistically explained by her attendance to a given institution, conditional on her observable characteristics, discipline, geographical origin and the time she took to graduate. Universities are ordered from left to right according to their official university code, lower codes corresponding in general to northern locations and bigger codes' to southern ones. The positive slope suggests that, as one moves across universities from the north to the south of Italy, grades—conditional on individual's observable characteristics—tend to increase. Similarly, Figure 2 shows how grades vary across disciplines. This figure suggests that there are

[6] The difficulty of each particular program could be described in two ways: as the time that is necessary in order to complete a program and obtain a certain grade or as the final grade that an individual will obtain if she takes a given period time to graduate.

[7] See, for instance, Boero et al. (2001) who studies the determinants of academic success using the ISTAT survey corresponding to year 1998.

[8] The inclusion in equation (1) of university and discipline fixed affects significantly the explanatory of the model. Including university dummies increases the *R*-square from 21.68 percent to 28.54 percent. The subsequent inclusion of the discipline fixed effects raises *R*-square to 39.82 percent.

Table 3 Individual characteristics and performance in university, labour market and external professional qualification exams

	(1) University grade		(2) Extra years in university		(3) Employment probability		(4) Log wage		(5) Employment with knowledge match		(6) Qualification exams	
	OLS		OLS		Probit		OLS		Probit		Probit	
Pre-determined individual characteristics												
Female	0.757***	(0.081)	−0.067***	(0.015)	−0.047***	(0.005)	−0.128***	(0.007)	−0.068***	(0.008)	0.001	(0.006)
Age	−0.169***	(0.011)	0.160***	(0.004)	0.002***	(0.001)	0.012***	(0.001)	−0.002**	(0.001)	−0.007***	(0.001)
Father was												
Working	Benchmark		Benchmark		Benchmark		Benchmark		Benchmark		Benchmark	
Looking for a job	−0.060	(0.496)	−0.229**	(0.101)	−0.013	(0.025)	−0.019	(0.052)	−0.002	(0.048)	−0.011	(0.034)
A pensioner	0.308	(0.217)	−0.007	(0.045)	−0.011	(0.014)	−0.034	(0.021)	−0.026	(0.021)	−0.006	(0.018)
Other	0.329	(0.272)	0.087	(0.057)	0.003	(0.015)	−0.076***	(0.030)	0.033	(0.024)	−0.004	(0.023)
Mother was												
Working	Benchmark		Benchmark		Benchmark		Benchmark		Benchmark		Benchmark	
Looking for a job	0.575	(0.376)	0.195**	(0.087)	−0.007	(0.024)	−0.216***	(0.064)	−0.021	(0.049)	0.003	(0.031)
A pensioner	0.150	(0.215)	−0.047	(0.042)	−0.016	(0.017)	−0.019	(0.017)	−0.023	(0.022)	0.005	(0.016)
Other	−0.118*	(0.064)	0.001	(0.013)	−0.004	(0.004)	−0.005	(0.007)	0.000	(0.006)	−0.010**	(0.005)
Father's education												
Elementary license or none	Benchmark		Benchmark		Benchmark		Benchmark		Benchmark		Benchmark	
Secondary education license	−0.136	(0.094)	−0.016	(0.020)	−0.003	(0.006)	0.022***	(0.008)	0.017*	(0.009)	0.001	(0.007)
Higher education diploma	−0.193*	(0.100)	0.004	(0.021)	0.000	(0.006)	0.033***	(0.009)	0.028***	(0.010)	0.010	(0.007)
University degree	−0.204*	(0.120)	−0.048*	(0.025)	−0.013*	(0.008)	0.035**	(0.011)	0.037***	(0.012)	0.018**	(0.008)

(continued)

Table 3 Continued

	(1) University grade	(2) Extra years in university	(3) Employment probability	(4) Log wage	(5) Employment with knowledge match	(6) Qualification exams
	OLS	OLS	Probit	OLS	Probit	Probit
Mother's education						
Elementary license or none	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark
Secondary education license	−0.216** (0.088)	−0.036* (0.018)	0.012** (0.005)	0.020* (0.007)	0.012 (0.009)	0.000 (0.007)
Higher education diploma	−0.420*** (0.098)	−0.087*** (0.021)	0.014** (0.006)	0.030** (0.009)	0.021** (0.010)	−0.003 (0.007)
University degree	−0.260** (0.131)	−0.204*** (0.028)	0.019** (0.007)	0.028*** (0.013)	0.036*** (0.013)	0.015 (0.009)
Father's sector of work						
Agriculture	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark
Industry	0.375*** (0.140)	0.016 (0.030)	0.024*** (0.008)	0.004 (0.013)	0.021 (0.013)	0.005 (0.010)
Services	0.504*** (0.134)	0.039 (0.029)	0.020*** (0.008)	−0.016 (0.013)	0.012 (0.013)	0.000 (0.010)
Other	0.831** (0.347)	0.026 (0.079)	−0.004 (0.021)	(0.071*** (0.033)	−0.053 (0.037)	0.043* (0.018)
Number of siblings	0.085** (0.033)	0.012* (0.007)	(0.007*** (0.002)	0.005* (0.003)	0.005 (0.003)	−0.000 (0.003)
Nationality						
Italian	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark
European Union	0.989 (0.819)	0.055 (0.147)	0.066* (0.024)	0.094 (0.080)	0.162** (0.055)	0.027 (0.043)
Extra-communitarian	1.786*** (0.688)	0.054 (0.129)	0.058 (0.057)	0.069 (0.070)	0.124* (0.069)	0.001 (0.047)
Type of high school						
Scientific lyceum	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark	Benchmark
Classic lyceum	0.409*** (0.080)	0.034** (0.017)	−0.025*** (0.005)	−0.030*** (0.009)	−0.015* (0.009)	−0.005 (0.007)
Technical industrial institute	−1.062*** (0.133)	−0.021 (0.026)	0.030*** (0.008)	0.019*** (0.009)	−0.016 (0.012)	0.014** (0.007)

(continued)

Table 3 Continued

	(1) University grade		(2) Extra years in university		(3) Employment probability		(4) Log wage		(5) Employment with knowledge match		(6) Qualification exams	
	OLS		OLS		Probit		OLS		Probit		Probit	
Technical institute for geometers	−1.458***	(0.167)	−0.020	(0.034)	0.009	(0.010)	−0.035**	(0.014)	0.008	(0.016)	0.026***	(0.008)
Technical commercial institute	−1.544***	(0.102)	0.050**	(0.020)	−0.005	(0.006)	−0.009	(0.008)	−0.033***	(0.010)	−0.001	(0.011)
Other type of technical institute	−1.516***	(0.172)	0.039	(0.035)	0.004	(0.011)	0.020	(0.013)	−0.008	(0.017)	0.021**	(0.009)
Teachers school or institute	−0.882***	(0.122)	0.221***	(0.030)	0.003	(0.007)	0.027***	(0.011)	0.022*	(0.013)	0.017	(0.011)
Language lyceum	−1.181***	(0.141)	0.198***	(0.038)	−0.004	(0.010)	0.011	(0.013)	−0.052***	(0.015)	−0.004	(0.019)
Professional institute	−2.223***	(0.181)	0.034	(0.041)	−0.004	(0.011)	−0.023	(0.019)	−0.021	(0.018)	0.002	(0.013)
Art lyceum or institute	−1.524***	(0.237)	0.221***	(0.045)	−0.029*	(0.016)	−0.070***	(0.022)	−0.052**	(0.024)	0.001	(0.013)
Other	−1.092***	(0.416)	−0.039	(0.094)	0.006	(0.024)	−0.013	(0.045)	0.080**	(0.038)	0.027	(0.031)
High-school grade	0.303***	(0.004)	−0.016***	(0.001)	0.002***	(0.000)	0.005***	(0.000)	0.003***	(0.000)	0.001*	(0.000)
Military service obligations												
Exempt	−0.077	(0.093)	0.008	(0.017)	0.002	(0.006)	0.023***	(0.008)	0.009	(0.009)	−0.019***	(0.006)
Before university	0.085**	(0.033)	−0.691***	(0.044)	0.047***	(0.009)	0.092***	(0.013)	0.049***	(0.017)	−0.024*	(0.015)
College-related Individual characteristics												
Moved from other course	0.021	(0.095)	−0.320***	(0.024)	0.012**	(0.006)	0.017***	(0.008)	−0.001	(0.010)	0.006	(0.008)
Second degree	1.184***	(0.420)	−1.151***	(0.137)	0.047	(0.047)	0.049	(0.098)	0.127	(0.079)	−0.079	(0.049)

(continued)

Table 3 Continued

	(1) University grade		(2) Extra years in university		(3) Employment probability		(4) Log wage		(5) Employment with knowledge match		(6) Qualification exams	
	OLS		OLS		Probit		OLS		Probit		Probit	
Studied in the region of birth	0.262***	(0.100)	0.147***	(0.021)	0.004	(0.006)	−0.035***	(0.008)	−0.027***	(0.010)	0.025***	(0.008)
Studied in the town of birth	0.687***	(0.078)	−0.050***	(0.016)	0.004	(0.005)	0.020***	(0.007)	−0.009	(0.008)	−0.038**	(0.006)
Moved from own town to study	0.020	(0.073)	0.056***	(0.015)	0.004	(0.004)	0.009	(0.007)	0.020***	(0.007)	0.006	(0.009)
Province of birth characteristics, 2 years before graduation												
GDP* (10)	0.064	(0.082)	−0.013	(0.017)	−0.002	(0.005)	−0.011	(0.008)	0.020**	(0.009)	0.018***	(0.001)
Unemployment	0.054***	(0.019)	0.010***	(0.004)	−0.001	(0.001)	0.011***	(0.002)	0.007***	(0.002)	0.002	(0.002)
Population* (10,000)	−0.003	(0.003)	0.004	(0.006)	0.001	(0.002)	0.005*	(0.003)	0.003	(0.003)	−0.005**	(0.002)
Other dummies and controls												
Province of origin	Yes		Yes		Yes		Yes		Yes		Yes	
Course fixed-effect											Yes	
Discipline fixed-effect	Yes		Yes		Yes		Yes		Yes			
University fixed-effect	Yes		Yes		Yes		Yes		Yes		Yes	
Extra years taken to graduate	Yes											
University grade			−0.033***	(0.001)								
(Pseudo) *R*-squared	0.403		0.361		0.157		0.226		0.0811		0.1726	
Number of observations	61,844		61,844		52,532		37,552		49,103		26,344	

Notes: *Significant at 10%; **significant at 5%; ***significant at 1%. For probit regressions marginal effects at mean values are reported. Standard errors in parentheses.

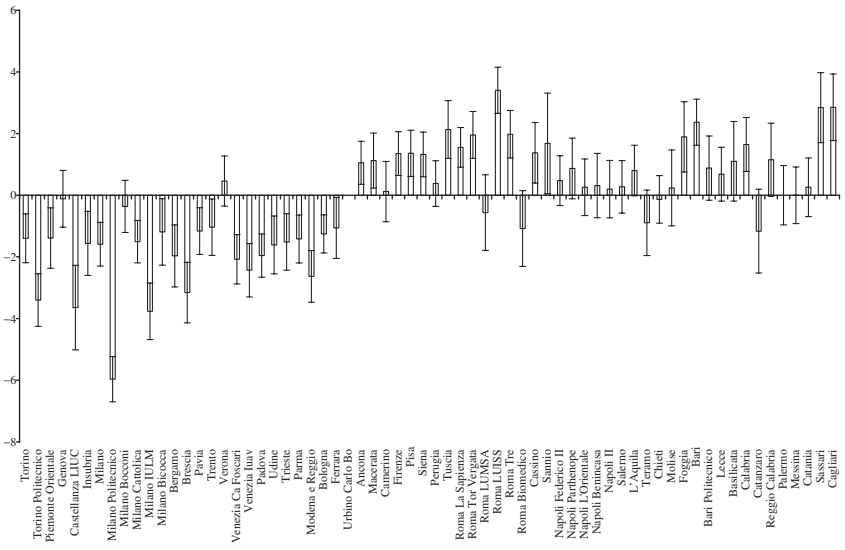

Figure 1 Grades across universities
Notes: Bars' length represent university dummies obtained from a OLS regression, where dependent variable is grades. Controls include individual characteristics, discipline and time taken to graduate. Universities are ordered by official code, university of Urbino is the benchmark. The error bars indicate the confidence intervals at the 5% significance level.

notable differences in the size of discipline fixed-effects on grades with Engineering, Economics and Statistics, Chemistry and Pharmacy, and Law being among the lowest grading and Agriculture, Literature, Pedagogy and Architecture among the highest grading disciplines.

The second column of Table 3 displays the results of the above model when we use as dependent variable the number of extra years taken to graduate. The previous findings are largely confirmed. Results concerning the variation of university and discipline dummy coefficients in this case are qualitatively very similar to the ones of Figures 1 and 2 and are available upon request.

Two important caveats apply to the above estimations. First, note that the estimation builds on the information provided by individuals with similar characteristics, including geographic origin, but who decide to attend different departments. This strategy provides consistent estimates as long as these individuals do not differ significantly in their unobservable characteristics. Second, another important concern regards the

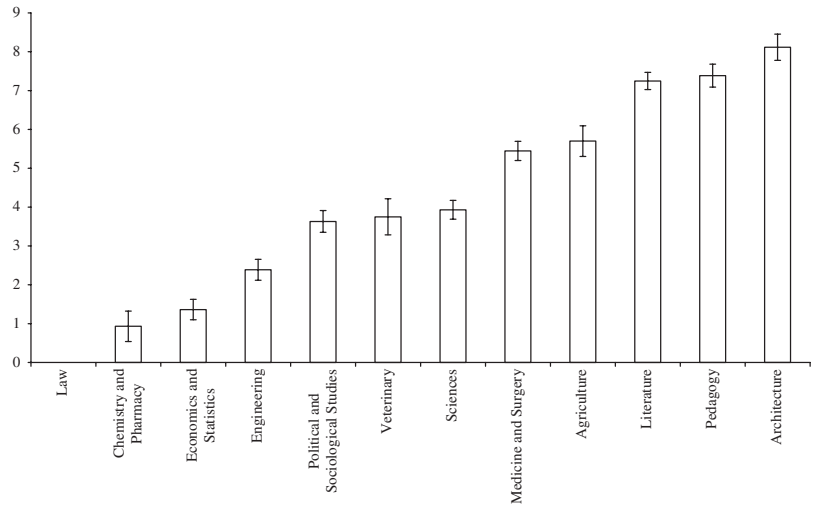

Figure 2 Grades across fields
Notes: Bars' length represent discipline dummies obtained from a OLS regression, where dependent variable is grades. Right hand side controls include individual characteristics, university and time taken to graduate. Law is the benchmark. The error bars indicate the confidence intervals at the 5% significance level.

endogeneity of the sample. In fact, we observe only graduates, but not drop-outs.[9]

4.2 Differences in quality or differences in grading standards?

The above results show that grades, conditional on graduates' pre-determined characteristics, tend to vary greatly across universities and fields. In principle, these differences could be due either to the value added by universities or to their grading standards. To investigate these

[9] This shortcoming generates two problems. First, the factors that afect the grades obtained by those students that do not manage to graduate could differ from the factors affecting the grades obtained by graduates. A key assumption is, therefore, that the grades obtained by graduates consistently reflect, conditional on observables, the grades obtained by those students that dropped out before graduation. Second, a more subtle problem is related to the fact that the very same unobservable characteristics—i.e. talent or grading standards—that affect grades do also affect selection into the sample, this is, graduation. This makes the usual selection based on observables assumption likely to fail. Still, the nature of the problem allows us to make some predictions about the direction of the bias, at least among the cohort of students that graduate on time. Any factor that generates an increase in grades would presumably increase the size of this cohort. The new sample would include individuals which are, conditional on observables, relatively worse in unobservables. This suggests that the effect of factors that generate an increase in grades will tend to be underestimated or, in other words, that the estimated coefficients will tend to be a lower bound of their true value.

alternative explanations, we use two additional proxies of quality. First, we exploit the indicators detecting graduates' labour market performance. If higher grades reflect higher value added, graduates from high grading departments should perform better in the labour market. Second, we use the outcomes of external professional qualifying exams. In Italy, they are compulsory for a number of professional occupations. If higher grades reflect higher quality, graduates from high grading institutions should display higher passing rates.

Labour market outcomes

Graduates' labour market performance L_i is likely to be affected by a number of socioeconomic characteristics X_i, by their field of study D_f and by the university attended D_u. Equation (2) analyses this relationship:

$$L_i = \alpha_t + \beta X_i + \gamma D_f + \delta D_u + \varepsilon_{itfu}. \quad (2)$$

Table 3 presents the estimation results of this model when labour market performance is measured, 3 years after graduation, by the employment status (column 3), the wage (column 4) and the probability of finding a job, which requires a university degree (column 4) of those individuals who are in the labour force.[10] If, on the one hand, female perform better in terms of grades, on the other, they exhibit a worse performance in the labour market. Similarly, foreign graduates are not able to transform their higher academic performance into better labour market outcomes.

In addition to personal characteristics, the institution attended is a key predictor of future labour market performance. Figure 3 depicts the estimates of universities' fixed effects on wages conditional on the individuals' observable characteristics, their geographical origin and discipline. Again, universities are ordered from left to right according to their official ISTAT code number, which increases as we move from the north to the south of Italy. Thus, the negative slope observed in Figure 3 suggests that northern universities' graduates tend to earn higher wages than southern universities' ones. A similar pattern is observed if we restrict our analysis to graduates who finished their studies on time. Including the region of actual residence does not affect the pattern observed in the histogram. Thus, our results are not driven by unobserved labour market conditions. The picture is similar if we use as dependent variable graduates' employment status: given two students with similar socio-economic backgrounds and geographical origins, those who graduate from a northern university are more likely to be successful in the labour

[10] Results are essentially unchanged, if we consider instead the whole population of graduates, including also those graduates that do not look for a job.

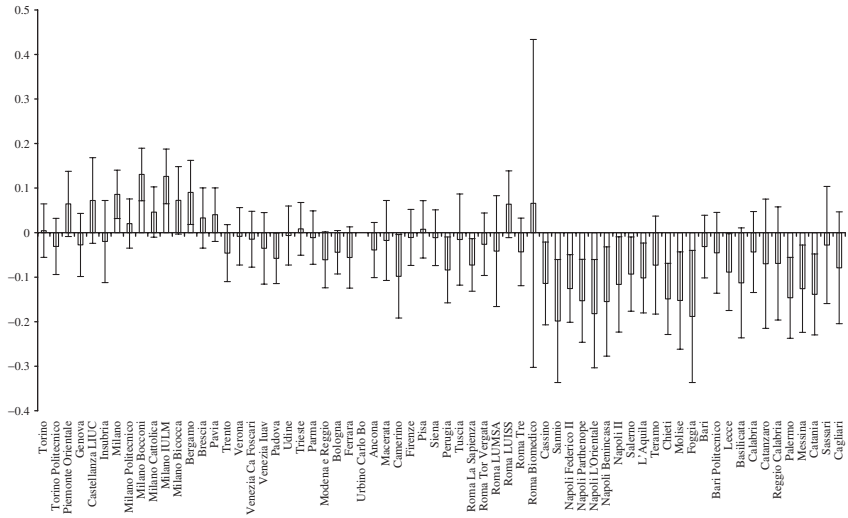

Figure 3 Wages across universities
Notes: Bars' lengths represent universities dummies obtained from an OLS regression, where the dependent variable is wage. Right hand side controls include individual characteristics, discipline and time taken to graduate. Universities are ordered by official code, university of Urbino is the benchmark. The error bars indicate the confidence intervals at the 5% significance level.

market than those who graduates from a southern university, even if they end up working in the same region. This result is consistent with previous studies that also find a premium for graduating in the north (Brunello and Cappellari 2005; Pozzoli 2006; Makovec 2007). Moreover, we observe significant differences across disciplines in terms of wages. In particular, conditional on graduating in the same university, high-school grades, individual background and province of origin, graduates in Engineering, Economics and Statistics, Chemistry and Pharmacy and Medicine are likely to have higher wage with respect to graduates in Veterinary, Literature, Law and Pedagogy (Figure 4).

As shown in Figures 1 and 3, while grades tend to be higher in southern universities, labour market outcomes tend to be better for those that graduate in the North. With the exception of Law departments,[11] the same pattern generally holds at the discipline level: high grading disciplines tend to provide lower labour market opportunities for their student.

[11] Law is a quite particular case. Note that in Italy, graduates in Law must spend at least 2 years as interns before taking professional qualification exams and becoming lawyers.

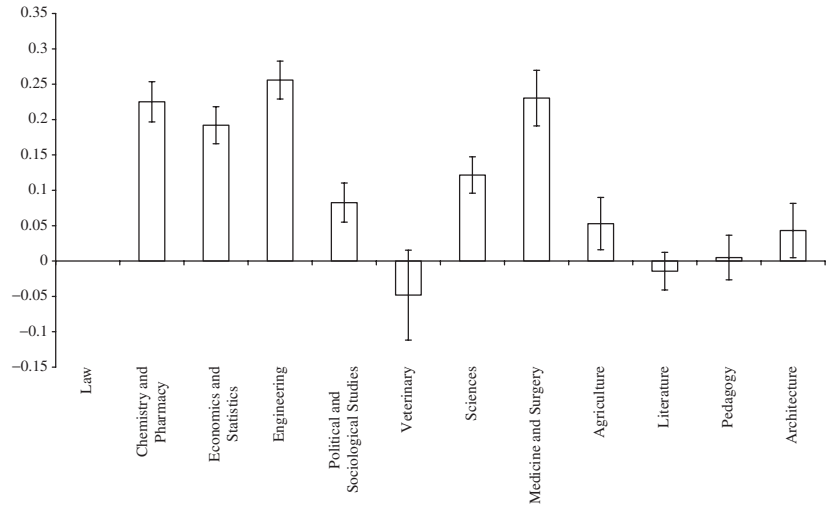

Figure 4 Wages across fields
Notes: Bars' lengths represent discipline dummies obtained from an OLS regression, where the dependent variable is wage. Right hand side controls include individual characteristics, university and time taken to graduate. Law is the benchmark. The error bars indicate the confidence intervals at the 5% significance level.

This descriptive evidence suggests that there exists a negative correlation between departments' grades and their graduates' labour market outcomes, both across universities and across fields of study. Bellow, we formally test this statistical relationship.

First, we estimate an equation, in which—as in Equation (1)—we analyse the determinants of grades, but we substitute the discipline and university dummies with a set of dummies specific to each university department separately for 1995, 1998 and 2001 D_{td}:

$$G_i = \beta X_i + \gamma D_{td} + \alpha_t + \varepsilon_{itd}. \tag{3}$$

Second, using the department dummies coefficients ($\widehat{\gamma}$), we decompose individuals' grades into two components: (1) $\widehat{\gamma}_{td} D_{td}$, reflecting the (conditional) average grade obtained by individuals that graduated within the same cohort and department and (2) the relative grade obtained by the individual, calculated as a difference between the actual grade and the estimated grade conditional on personal characteristics $[\widetilde{G}_i = G_i - \widehat{\gamma}_{td} D_{td}]$. Third, we study how these components affect labour market performance measures:

$$L_i = \alpha_t + \beta X_i + \eta \widetilde{G}_i + \mu \widehat{\gamma}_{td} + \varepsilon_{itd}, \tag{4}$$

Table 4 presents the estimation results of Equation (4) using three different measures of graduates' labour market performance: the probability of being employed (columns 1 and 2), the probability of finding a job that requires a university degree (columns 3 and 4) and the expected wage (columns 5 and 6). Conditional on their observable personal characteristics, the number of years spent in university and the discipline chosen, students that obtain higher grades *relative to their classmates* are more likely to be employed 3 years after graduation and, if employed, tend to earn a significantly higher wage. However, the department's average grade has the opposite effect. Students that graduated from universities where average grades were higher are significantly less likely to be employed (column 1) and, if employed, they are not more likely to have a job that requires a degree (column 3) and do not tend to earn more (column 5). Results remain essentially the same if we include among the controls graduates' class size or the region of graduates' residence when being interviewed. In columns 2, 4 and 6, we compare individuals who graduated in the same university but who had enrolled into different fields. We find that those individuals who obtained their degree in departments with relatively higher average grades are significantly less likely to find a job which requires being a graduate (column 4) and actually tend to earn significantly less (column 6). As in the previous analysis, controlling for the region of current residence does not have a significant effect on the estimates.

The above results may help to rationalize the puzzling correlation that arises when we compare the academic performance of Italian graduates with their performance in the labour market. A simple descriptive analysis of the data provided by the ISTAT surveys on year 1995, 1998 and 2001 graduates reveals that those individuals that had obtained higher grades in university do not obtain higher wages later on (see Table 5, columns 1, 2 and 3).[12] In the last edition of the survey, it turns out that grades are negatively correlated with earnings: graduates who obtained lower grades tend to earn relatively more. Of course, as our above results suggested, this negative relationship is driven by the different grading standards that departments apply. As expected, once we take into account the university and the department from which an individual has graduated the expected positive relationship between grades and salary is re-established (though, significant only at 11 percent).

[12] Boero et al. (2001) already point out that the grades of 1998 graduates show no correlation with their wages.

Table 4 The effect of grades on labour market outcomes

	(1) Employment		(2) Employment		(3) Knowledge match		(4) Knowledge match		(5) Log wage		(6) Log wage	
	Probit		Probit		Probit		Probit		OLS		OLS	
Individual relative grade	0.003*	(0.002)	0.003	(0.002)	0.010***	(0.002)	0.010***	(0.001)	0.003***	(0.001)	0.004***	(0.001)
Department fixed effect on grade	−0.020***	(0.006)	0.005	(0.004)	0.006	(0.004)	−0.014***	(0.003)	0.001	(0.001)	−0.009***	(0.001)
Controls												
Year of graduation	Yes		Yes		Yes		Yes		Yes		Yes	
Extra years taken to graduate	Yes		Yes		Yes		Yes		Yes		Yes	
Individual characteristics‡	Yes		Yes		Yes		Yes		Yes		Yes	
Province of origin* (High-school grade)	Yes		Yes		Yes		Yes		Yes		Yes	
Province of origin characteristics‡	Yes		Yes		Yes		Yes		Yes		Yes	
Discipline dummies	Yes				Yes				Yes			
University dummies			Yes				Yes				Yes	
Observations	42,819		42,819		40,051		40,051		31,040		31,040	
(Pseudo) *R*-square	0.1614		0.1431		0.0780		0.0684		0.2335		0.2081	

Notes: *Significant at 10%; ***significant at 1%. For probit regressions marginal effects at mean values are reported. Standard errors in parentheses. Students from private universities and departments with constrained admission are excluded. ‡Variables listed in Table 3 are included among the regressors.

Table 5 The (puzzling) relationship between grades and wages

	(1) 1995	(2) 1998	(3) 2001	(4) 2001	(5) 2001	(6) 2001
University grade[†]	0.007	−0.004	−0.017**	0.010	−0.008	0.015
	(0.010)	(0.006)	(0.008)	(0.009)	(0.009)	(0.010)
Controls						
Year of enrolment	Yes	Yes	Yes	Yes	Yes	Yes
Extra years taken to graduate	Yes	Yes	Yes	Yes	Yes	Yes
Individual characteristics[‡]	Yes	Yes	Yes	Yes	Yes	Yes
Province of origin					Yes	Yes
Province of origin characteristics[‡]	Yes	Yes	Yes	Yes	Yes	Yes
Discipline dummy				Yes		
University dummy					Yes	
Department dummy						Yes
Observations	8700	10,697	11,643	11,643	11,643	11,643
R-squared	0.1481	0.1543	0.1271	0.1706	0.145	0.1976

Notes: **Significant at 5%. Standard errors in parentheses. Students from private universities and departments with constrained admission are excluded. [†]The coefficient shows the effect of a 10-point increase in grade. [‡]Variables listed in Table 3 are included among the regressors.

Professional qualification exams

An additional way to test whether higher grades reflect higher quality or simply different standards is to exploit the outcomes of post-university professional qualification exams (“abilitazione professionale”). These exams are granted by official professional organizations and are meant to certify that a given graduate holds a minimal set of competencies for a given profession. They are not compulsory but are required in order to perform legally a number of professions. The set of professions for which an exam is required includes Architects, Chemists, Accountants, Physicians, Psychologists or Engineers.[13]

The ISTAT survey allows to observe whether a given graduate has passed the corresponding external qualification exam within 3 years of her graduation. A potential source of bias of this measure might arise from the fact that we only observe whether individuals succeeded in the professional qualification exam, but not whether they took it and failed. This problem is likely to be bigger in those disciplines where graduates have other professional possibilities that do not require an official qualification.

[13] For a complete list of Italian professional organizations and details of respective exams see http://it.wikipedia.org/wiki/Albo_professionale.

As it is shown in Table 1, about half of respondents have passed an external qualification exam after graduation. However, the distribution of this percentage across fields is not homogenous[14]: the probability that a graduate pass the qualification exam ranges from 0 to 40 percent in 66 percent of courses, from 40 to 60 in 4 percent of courses and from 60 to 100 percent in 30 percent of courses. In other words, there exist a big group of courses in which more than 60 percent of graduates do not ever pass the exam, another group of courses in which more than 60 percent of graduates pass the exam and very few courses that could not be attributed either to the first or to the second group. In order to minimize the problem of self-selection described above, we restrict the analysis to those occupations where graduates have a very limited scope for professional possibilities unless they pass the external qualification exam. In what follows only the latter group of courses, namely, the one in which more than 60 percent of graduates passed the exam (mainly Engineering and Chemistry courses), is considered.

Column 6 of Table 3 shows the relationship between individual characteristics and the probability of success in qualification exams. As expected, success in this exam is closely related to graduates' quality, as measured by high-school grades and other socioeconomic characteristics.

In Table 6, we analyse the relationship between university grades and performance in external qualification exams. We find that conditional on the department and university attended, those graduates that obtained relatively better grades than their classmates in university are significantly more likely to pass the qualification exams. Then, we investigate whether the (conditional) average grade of all individuals that graduated within the same cohort and department $\widehat{\gamma}_{td}D_{td}$, as defined in the previous subsection, has a similar positive effect on graduates' performance in professional qualification exams A_i, estimating the following regression:

$$A_i = \alpha_t + \beta X_i + \eta \widetilde{G}_i + \mu \widehat{\gamma}_{td} + \varepsilon_{itd}. \tag{5}$$

As shown in column 2 of Table 6, while we still find that within each department better students are more likely to succeed in professional qualification exams, in general graduates from departments with higher average grades tend to be less successful in professional qualification exams. Given that in these fields the lack of success in external exams is associated with significantly lower employment rates and with significantly lower probabilities of finding a job, which requires a degree, our

[14] Degree course defines graduates' specialization within a certain discipline. Each disciplinary field on average offers around 10 different degree courses.

Table 6 The effect of grades on performance in external qualification exams

	(1)	(2)
University Grade	0.002*** (0.001)	
Individual relative grade		0.002***
		(0.001)
Department fixed effect on grade		−0.008**
		(0.004)
Controls		
Year of graduation	Yes	Yes
Extra years taken to graduate	Yes	Yes
Individual characteristics‡	Yes	Yes
Province of origin* (High-school grade)	Yes	Yes
Province of origin characteristics‡	Yes	Yes
Course dummies	Yes	Yes
Department dummies* (Year of graduation)	Yes	
Observations	16,261	16,261
(Pseudo) *R*-square	0.2068	0.2018

Notes: **Significant at 5%; ***significant at 1%. Marginal effects at mean values are reported. Standard errors in parentheses. Students from private universities and departments with constrained admission are excluded. ‡Variables listed in Table 3 are included among the regressors.

results suggest that the variations in the department-average component of grades are not likely to reflect better quality.[15]

4.3 Differential grading standards and the funding of italian universities

Before 1993, the Italian national ministry of education was in charge of fixing the total amount of funds, their shares across public universities and their allocation across disciplines. Its decisions were largely made on historical bases and were sometimes affected by distinct deals with single institutions and faculties within institutions. In 1993, a reform was approved allowing each university to become an autonomous entity with its own budget to be allocated across distinct disciplines (law n.537/1993). Moreover, discretion was replaced by a complex set of rules, which in the short run left about 90 percent of the big bulk of public funding to be assigned on historical basis and the rest to be allocated via an equalization

[15] Those graduates who passed the professional exam have a probability of finding a job that matches the knowledge acquired in university, which is 11 percentage points higher than the rest of individuals in the sample. Note also that if individuals' unobserved ability in university performance was positively correlated to individuals' unobserved ability in professional qualification exams, the estimated coeffcient must be considered as an upper bound of its true value.

component (EC). The latter is supposed to progressively substitute the former. The EC objective is 2-fold: first, to reduce public funding disparities across universities and across disciplines and, second, to incentivate quality. On the incentives side, the EC seeks to reward the quality of teaching linking funding to the number of exams passed by enrolled students. Technically, the funds depend positively on the share of FTE students, which is defined as the ratio between the number of exams that students passed and the number of exams that students should have taken. See Perotti (2002) for details.

In principle, the measure of quality based on the share of FTE students might be subject to at least two problems. First, it fails to take into account the initial quality of students. Universities that attract students of better quality will tend to perform relatively better even if they fail to provide better education. Second, in the absence of quality assurance mechanisms, the FTE might capture both the students true quality and the easiness (or grading standards) of a given institution.[16] In fact, the evidence provided in the previous section suggests that the relationship between the average grades issued by different universities and the performance of their graduates in the labour market or in qualification exams is, if any, negative. A straightforward implication of this result is that financing universities based on their self-evaluated academic performance does not necessary reward those universities that generate a higher value.

Table 7 shows the relationship between graduates' labour market outcomes and the share FTE students in the department where they graduated, conditional on graduates' socioeconomic background and pre-university measures of quality. While the number of FTE students is meant to proxy the quality of a department, we find a strong and significant negative relationship between this measure and graduates' labour market outcomes, as measured by occupation rates (column 1) and obtaining a job which requires a university degree (column 2). We also find no significant relationship whatsoever between the share of FTE students and graduates' wages (column 3) or their performance in professional qualification exams and (column 4).

To sum up, FTE fails to capture quality of institutions, at least as measured by graduates' performance in the labour market and in professional qualification exams.

[16] In 1996 and 1999, two distinct kinds of evaluating committees were established to preserve quality: a National Committee (Comitato Nazionale per la Valutazione del Sistema Universitario) and several Internal Committees (Nuclei di Valutazione Interna). However, as convincingly argued by Perotti (2002), their objectives are too vague and they turned out to be to be largely ineffective.

Table 7 The relationship between the share of FTE students and labour market performance

	(1) Employment	(2) Knowledge match	(3) Log wage	(4) Qualification exams
	Probit	Probit	OLS	Probit
FTE students[†]	−0.032*	−0.032*	−0.006	0.013
	(0.018)	(0.018)	(0.004)	(0.031)
Controls				
Year of graduation	Yes	Yes	Yes	Yes
Extra years taken to graduate	Yes	Yes	Yes	Yes
Individual characteristics[‡]	Yes	Yes	Yes	Yes
Province of origin* (High-school grade)	Yes	Yes	Yes	Yes
Province of origin characteristics	Yes	Yes	Yes	Yes
Discipline dummies	Yes	Yes	Yes	
Course dummies				Yes
Observations	13,579	13,579	10,424	5233
(Pseudo) *R*-square	0.1667	0.1667	0.2151	0.1814

Notes: *Significant at 10%. Standard errors in parentheses. [†]The coefficient shows the effect of an increase of 10 Full Time Equivalent Students in 1995. [‡]All variables listed in Table 3 are included among the regressors. Only students that graduated in 1998 from a public universities and from a department with open entry have been considered.

5 Conclusion

In recent years, a number of European countries, including Italy, have adopted output funding schemes based on the number of diplomas or grade points each institution delivers. One of the pre-conditions for such systems to be effective in providing quality enhancing incentives is ensuring homogeneity of educational quality and grading standards across institutions. Otherwise, as noted by Jacobs and Van der Ploeg (2006), this practice might undermine incentives to improve educational quality, as in most cases the quantity rather than the quality of output is rewarded due to the difficulties in measuring the later.

In this article, we analyse grading standards across Italian universities and disciplines. More specifically, we study the performance of several cohorts of Italian graduates in the labour market and in external qualification exams and analyse how it relates to their performance in university. We find that, conditional on a large set of individuals' observable characteristics that includes geographical origin, high-school grade and socioeconomic background, graduates from high-grading departments tend to perform significantly worse in the labour market.

Moreover, graduates from high-grading universities are less likely to succeed in external qualifying exams that are required for many professional activities. These results suggest that the significant variations in grades that can be observed in Italy across disciplines and universities reflect to a large extent differences in grading standards.

In line with this evidence, we also find that the output measure of university quality that has been adopted by the Italian Ministry of Education to allocate funds across universities—i.e. the number of FTE students defined as the ratio between the number of exams that students passed and the total number of exams that they should have taken—is negatively correlated with graduates' labour market outcomes.

This finding rises concerns on the effectiveness of such funding mechanisms. In light of this evidence, the implementation of quality ensuring mechanisms–such as a system of external examiners as in the UK—should be seriously considered as a necessary complement to any output funding scheme. Additionally, given that obtaining objective evaluations of external examiners might be itself problematic and costly, a more radical policy option may involve fostering reputation effects in the market for higher education. This goal may be approached in different ways, for instance, by allowing universities to select their students and, simultaneously, promoting student mobility, by letting universities set tuition fees and introducing efficient student loan systems.[17]

References

Anglin, P.M. and R. Meng (2000), ''Evidence on Grades and Grade Inflation in Ontario's Universities'', *Canadian Public Policy* **XXVI(3)**, 361–68.

Boero G., A. McKnight, R.A. Naylor and J. Smith (2001), ''Graduates and the Graduate Labour Market: Evidence from the UK and Italy'', Special Issue of *Lavoro e Relazioni Industriali*, 131–72.

Brunello, G. and L. Cappellari (2005), ''The Labour Market Effects of Alma Mater: Evidence from Italy'', IZA Discussion Paper, No. 1562. Forthcoming in *Economics of Education Review*.

Chapman, K. (1997), ''Degrees of Difference: Variability of Degree Results in UK Universities'', *Higher Education* **33(2)**, 137–53.

Costrell, R.M. (1994), ''A Simple Model of Educational Standards'', *The American Economic Review* **84(4)**, 956–71.

[17] See Mas-Colell (2003–2004) for a thorough discussion on reforms that might foster competition and reputation effects in the European higher education space.

De Paola, M. and V. Scoppa (2007), ''Returns to Skills, Incentives to Study and Optimal Educational Standards'', *Journal of Economics* **92(3)**, 229–62.

Dickson, V.A. (1984), ''An Economic Model of Faculty Grading Practices'', *Journal of Economic Education* **6 (issue 3)**, 197–203.

Di Pietro, G. (2006), ''Regional Labour Market Conditions and University Dropout Rates: Evidence from Italy'', *Regional Studies: The Journal of the Regional Studies Association* **40(6)**, 617–30.

Dornbusch, R., A. Gentilini and F. Giavazzi (2000), ''Italian Labour Force Participation: Disguised Unemployment on Campus'', Paper presented at the Annual Meeting of the European Economic Association, Bolzano.

Freeman, D.G. (1999), ''Grade Divergence as a Market Outcome'', *Journal of Economic Education* **30(4)**, 344–51.

Jacobs, B. and F. Van der Ploeg (2006), ''Guide to Reform of Higher Education: A European Perspective'', *Economic Policy* **21(47)**, 535–92.

Kolevzon, M.S. (1981), ''Grade Inflation in Higher Education: A Comparative Study'', *Research in Higher Education* **15(3)**, 195–211.

Makovec, M. (2007), *Does it Pay to Study Far from Home? Explaining the Returns to Geographic Mobility of Italian College Graduates*, Universitat de Alicante, Mimeo.

Mas-Colell, A. (2003), ''The European Space of Higher Education: Incentive and Governance Issues'', *Rivista di Politica Economica* **93, part 11/12**, 9–27.

Mas-Colell, A. (2004), ''The European Higher Education Space: Funding Issues'', Third MEMS Lecture, Master's Program in Economics and Management Science, Humboldt University, Berlin, 30 April 2004.

Nelson, J.P. and K.A. Lynch (1984), ''Grade Inflation, Real Income, Simultaneity, and Teaching Evaluations'', *Journal of Economic Education* **15(1)**, 21–37.

OECD (2005), *Education at a Glance*, Organization for Economic Co-operation and Development, Paris.

Osservatorio per la valutazione del sistema universitario (1998), ''L'evoluzione della domanda di formazione universitaria: studenti, laureati e studenti equivalenti'', Rome, Italy.

Perotti, R. (2002), ''The Italian University System: Rules vs. Incentives'', Paper presented at the first conference on Monitoring Italy, ISAE, Rome, January.

Pozzoli, D. (2006), ''The Transition to Work for Italian University Graduates: Determinants of the Time to Obtain the First Job'', Milan Catholic University, Mimeo.

Sabot, R. and J. Wakeman-Linn (1991), ''Grade Inflation and Course Choice'', *Journal of Economic Perspectives* **5(1)**, 159–70.

Siegfried, J.J. and R. Fels (1979), ''Research on Teaching College Economics: A Survey'', *Journal of Economic Literature* **17(3)**, 923–69.

Staples, B. (1998), *Why Colleges Shower Their Students With A's*, *New York Times*, March 8.

Strenta, A.C. and R. Elliott (1987), ''Differential Grading Standards Revisited'', *Journal of Educational Measurement* **24(4)**, 281–91.

Wissenschaftsrat (2004). Empfehlungen zur Reform des Hochschulzugangs [Online]. http://www.wissenschaftsrat.de/texte/5920-04.pdf (last accessed in May 2008).