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Abstract

In the context of policy reforms in Higher Education in both the UK and Italy, we review recent evidence on student outcomes in higher education and subsequent transitions into the labour market for both these countries. We also provide the results of some new analysis for each of the two and, among other things, show that pre-university qualifications are strong influences on degree performance in both countries but that, unlike the UK, Italian university graduate earnings are largely insensitive to measured educational performance. Length of time taken to graduate in Italy exerts a significant negative effect both on degree performance and on graduate earnings. Similarly, being over-qualified for one s job is associated with a 5% pay penalty. Finally, we make recommendations regarding possible data improvements to enhance the policy usefulness of the analyses for each of the two countries.

JEL: J3, J4, I2

Key words: Graduates, Degree performance, Graduate labour markets.

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Introduction

Education, and not least higher education, has been at the forefront of public policy discussion and of government policy-making in the UK in recent years. A large number of educational reforms have been implemented in this time and others are pending. Similarly, in Italy significant reform packages have been proposed. In the context of the recent and on-going higher education debates in these two countries, the current paper addresses a number of empirical questions to data-sets pertaining to the UK and to Italy. Where relevant to policy discussions, and where the data permit, we draw conclusions regarding similarities and differences in the two cases.

Our main findings are the following. First, with respect to the academic performance of Italian university students, we find that on average, as in the UK, university performance by male students is weaker than that of females and varies considerably across degree subject area and by university region. Also consistent with evidence for the UK, degree performance in Italy is influenced strongly by the nature of prior educational attainment, such as score in the Maturità and type of Maturità taken. Unlike in the UK, graduation in Italy is a lengthy process: the mean period of registration for successful 1995 graduates was about seven and a half years. Length of registration is associated with a significant negative effect on performance.

With respect to the determinants of graduate earnings, the results for Italy suggest that neither the Maturità score nor the degree score influence graduate earnings: only graduating *con lode* generates a graduate pay premium for Italian students, and anyway this is only a small premium. This is in sharp contrast to results for the UK for which the evidence shows a strong dependence of graduate earnings on the level of educational attainment both prior to and at university. As in the UK, there are large pay differences according to the degree subject area studied in Italy but, unlike the UK, relatively few differences by university attended (as measured by university region). It is also interesting to note that Italian

university students who take longer to graduate earn significantly less than those graduating more quickly. Similarly, there is a pay penalty for those reporting themselves as over-qualified for their job.

We begin, in Sections 2 and 3, by describing the current policy contexts of higher education in the UK and Italy, respectively. Section 4 provides a selective and policy-relevant summary of recent UK evidence based on the analysis of individual-level data for entire cohorts of UK university students. Section 5 reviews some recent evidence for Italy and Section 6 presents some new results based on an analysis of the individual-level ISTAT (Istituto Nazionale di Statistica) data. Section 7 closes the paper with conclusions and further remarks.

2. The UK policy context

In the UK, one of the main themes on the agenda of higher education over the last 20 years has been the objective of expanding the participation rate of young people in higher education. Until the 1980s, only about 10% of each cohort of 18 year olds entered into a course of higher education study. This was one of the lowest participation rates in the industrialised world. Successive Conservative administrations implemented a variety of policies to raise the figure dramatically to 30% by the early 1990s, taking the entry rate close to that for Italy. The dropout rate, however, is much higher in Italy. In recent years, the UK Chancellor of the Exchequer has announced a Labour Government target of a 50% participation rate in higher education. Thus, there has been a consistent attempt to transform the UK university sector in the last two decades: away from its reputed status as an elite educational sector and toward a mass participation sector.

Expansion of the higher education sector is, of course, potentially expensive and, in the case of the UK, is being accompanied by a substantial programme of accommodating reforms. The first area of reform concerns the methods of funding

students through university. Until the period of expansion, full-time university students in the UK paid no tuition costs and received maintenance grants to cover term-time accommodation expenses and other costs of subsistence. The full maintenance grant was typically sufficient to cover all basic costs of living and studying. It was, however, related to parental income and, with rule changes through the 1980s, an increasing percentage of students were dependent on parental contributions toward their living and studying costs. Essentially, the maintenance grant system was being phased out to be replaced from 1988 with a system of student loans. This shift in policy has been associated with a dramatic rise in student debt, exacerbated by the introduction in 1998 of university tuition fees. This was the first time that full-time UK undergraduate students had been required to contribute toward tuition costs. Overseas students, part-time students and post-graduates, *inter alia*, had been liable to tuition payments over a long period. Higher education in the UK is expensive for two reasons. First, the unit of resource per student is traditionally high and, second, the fact that so many UK studentss leave home to study renders the university experience an expensive one.

The introduction of tuition costs has proved a controversial measure. The new Parliament in Scotland over-turned the policy for Scottish students. The issue was prominent in the recent general election in the UK and at the 2001 annual Labour Party conference the Prime Minister announced the launch of a new review into forms of student finance and funding. It is estimated that the average student graduates with a debt of around £12,000. Against this concern over increasing student debt, however, it is pointed out how tuition fees were introduced following the report of the government s Dearing Committee (1997) inquiry into higher education, which took evidence on the estimated private rates of return to university degrees. One of the pieces of evidence was provided by Blundell *et al.* (1997, 2000), which estimated the *ceteris paribus* earnings premium to an undergraduate degree to be around 17% for men and 37% for women. Essentially, the UK government defended its introduction of tuition fees on the basis

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of appealing to evidence of a substantial rate of return to a degree. In contrast, for Italy there is a stylised fact that the return to a degree is low.

In part, the expansion of the university student population has been achieved by the abolition of the former binary divide separating the university sector form the polytechnic sector. Paradoxically, the increased participation rate in the expanded sector together with the abolition of the binary divide has been accompanied by a growing concern over issues of equality of access into higher education. There are two obvious sources of this concern. First, the size of student debt combined with the up-front nature of the fees/loans system (as opposed to, say a graduate tax system) is feared to exercise a particularly strong disincentive effect on the participation rate of poorer students in higher education. This could be manifested in either a reduced rate of registration at university or in an increased drop-out rate. The drop-out rate has increased in the last ten years, though there has been no conclusive research to demonstrate that this is the result of changes in fees and funding or that the effects have been disproportionate among students from less advantaged backgrounds. A second source of concern regarding the general issue of access into higher education is reflected in the attention being paid to the social class backgrounds of students from the more traditional and prestigious universities in the UK. Widely-reported remarks by the UK Chancellor of the Exchequer during the academic year 1999-2000 on the fairness or otherwise of admissions procedures at the University of Oxford were associated with criticism of the procedures at a number of universities at which over 50% of students come from the private school sector. This is substantially disproportionate compared to the percentage of pupils educated in private schools in the UK   at less than 10%.

Just as evidence on the magnitude of the average earnings premium associated with a degree has been used to justify transferring more of the burden of costs onto students and their families and away from the general tax-payer, so too have there been strong suggestions that the extent of this transfer should vary

according to the extent of the premium for a degree (see for example, the Greenaway Report, (2000)). Dolton, Greenaway and Vignoles (1997) call for research into how estimates of the rate of return to a degree are likely to vary according to factors such as the degree course taken and the institution attended. The secretary of state for education has announced official opposition to the introduction of differential fees across courses and institutions, but has not ruled out their possible future introduction. Nor is it impossible that individual universities in the UK will autonomously introduce differential or top-up fees. In the context of concerns regarding equality of access into university, the possible introduction of top-up fees exacerbates concerns that precisely those institutions and courses associated with the greatest rates of return will become increasingly closed to students from poorer backgrounds, with adverse consequences for the prospects of improving intergenerational social mobility.

Although the binary divide between the pre-1992 university sector and the polytechnic sector has been abolished, the expanded sector remains a heterogeneous one. Expansion in student numbers has been associated with a falling unit of resource from central government with increased incentives for universities to attract private funding. Official league-table rankings of universities has added to these pressures. An example of the ranking exercises conducted on behalf of the government is provided by the 4-year cycle of national Research Assessment Exercises which evaluate the quality of academic research output by each university department. Results are widely published and also feed into the university funding formulae. This has impacted on the academic labour market in two particular ways. First, there has been a growing threat to the security of employment of under-performing research staff. Second, there has developed something of a suppliers market for highly-performing academics. The latter has put increasing pressure on the national system of pay scales negotiated in the annual centralised bargain between the national trade union of university staff (the AUT for the pre-1992 universities) and the national committee representing university

employers (Universities UK formerly the CVCP). Indeed, the powerful shift towards decentralisation and the associated competition between universities induced by ranking exercises and the need for increased financial independence has stimulated calls for the explicit privatisation of universities in some quarters. This was an explicit policy proposal from the main opposition party at the general election in the UK in 2000.

In the absence of privatisation, the UK higher education sector increasingly resembles a quasi-market. In this context, deprived of the ultimate price mechanism, the efficiency of the sector is encouraged through the prominence of published performance measures which affect both direct central funding as well as each institution s status and reputation within the sector. Following one of the recommendations of the Dearing Report (1997), the UK government established performance indicators for higher education institutions. In addition to a long-established Performance Indicator (PI) based on the Research Assessment Exercise evaluation of research output, there are newly-produced PIs based on criteria such as: teaching quality, student withdrawal (and its converse, progression), access and graduate employment outcomes.

The performance indicator based on teaching quality is very intrusive at the level of the individual university department, consisting as it does of a week-long visit by an expert panel examining all aspects of the delivery and quality assurance mechanisms associated with the department s teaching programmes. PIs based on student access and student withdrawal are based on the centralised records of each student registered at each institution. These centralised records are extremely rich in information. Each university is required to gather annual records on each of its students. These records contain information on:

(i)   The student s personal details (such as age, gender, marital status, nationality, ethnicity, social class of family background, family residence (at detailed level of post-code), fees status).

(ii)   The student s pre-university educational background. This information is based on the data contained in the student s formal

application to university and, typically, has been monitored by the applicant s previous educational institution. The information contains the identity of the previous school attended by the applicant, together with the applicant s scores in each of the subjects studied at school (i.e., typically, their A-level subject scores). Knowledge of the identity of the individual school attended by the student prior to university enables the researcher to merge into the data information on the characteristics of the school from contemporaneous official school-level data-sets which are themselves rich in information on average academic performance at the school and on socio-economic characteristics of the school population and neighbourhood. Furthermore, availability to the researcher of information on the pre-university home post-code of the student enables the merging in of information on the geo-demographic, economic and social characteristics of the local neighbourhood from offical Census information, *inter alia.*

(iii) The student s characteristics at university: such as course taken, annual performance, accommodation arrangements, completion/withdrawal, reason for leaving, final degree classification.

Each university is required to submit their detailed individual records to a national agency responsible as the central depository for student records. Until 1994, this agency was the Universities Statistical Record. Since 1994, this role has been discharged by the Higher Education Statistics Agency (HESA). Finally, we note that each UK university is also required to provide to HESA a First Destination Return record providing information on the destinations of university leavers 6 months after the end of the academic year in which they left university. This provides information on first destinations of responding students, which can then be matched to the full individual student records. Potentially this enables quite precise statistical modelling of the determinants of students first destination outcomes, analysing how these vary by academic performance, personal characteristics and institution of study, for example. The government-produced

indicators of institutional performance against the criteria of student progression/withdrawal and of post-university employment outcomes are based on these individual-level data matched, in the case of the latter, with the first destination survey records.

3. Reform in higher education in Italy

The Higher Education university sector in Italy is currently experiencing a significant transformation which will affect many aspects of the sector, including: the length of undergraduate degree programmes, the content and structure of the degrees (including a 3+2 model distinguishing between ordinary and specialist degrees), the pre-requisites and objectives of the programmes, the administration of university admissions and the extent of university autonomy and independence both educationally and financially. One part of the motivation for these changes lies in a concern with the whole process of student transition from university to the labour market.

In view of all of these significant changes in the Italian higher education system, it seems appropriate to conduct a programme of research into the determinants of student progress through university and beyond into the post-university labour market. An extensive research agenda would include the following questions (each of which begs the question of how results for Italy compare with experiences in other countries):

i)   What factors influence the decisions of students to apply for university and, in particular, for specific courses and universities? What are the characteristics of students which influence whether they will study at a university distant from their family home?

ii)   What determines the success of students in completing their course, and over what time horizon?

iii)   What determines the level of academic performance of university students? Does family background have an important

role? To what extent is previous educational performance as indicated, for example, by the voto in the Maturità important?

iv) What should an optimal university admissions process look like?

v) What determines the speed and success of transition of laureati into the graduate labour market? How important are socio-geographical mobility factors?

vi) How do experiences vary in each of these respects according to the course studied and the institution attended?

vii) What are the issues involved in measuring institutional performance?

In the current paper, we address aspects relevant to (ii), (v) and (vi) above. With respect to item (vii), league tables of Italian universities - by general faculty - are widely disseminated through newspaper publications. Censis Servizi has published a number of such league tables. This work is closely related to the national evaluation of Italian universities. The Censis rankings of university faculties (see, for example, La Repubblica 16/6/1) are derived on the basis of data from various sources, such as: the ministry for the universities and its statistical office, the committee for the evaluation of the university system, Cineca (Consorzio universitario per l'ettronica e l'informatica), Cnr, offices of the European Committee and the Agency for the Socrates programme. The league table rankings are based on five key sets of criteria:

i) Student success and failure: based on student numbers and student progression

ii) Attraction and reputation: based on student quality (capacity to attract well-qualified students and students from other regions) and the reputation of the faculty within the university sector

iii) Learning: based on factors like the variety of courses offered to students

iv) Research: based on factors such as the level of research funding attracted

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v)   International activities: based on the level of participation in both student exchange and international research collaboration

Given this, it is clear that both the methodology and the data for producing university league tables differ substantially between the UK and Italy. A major difference is that the rankings in Italy do not make adjustments for differences in university characteristics and circumstances. It would be interesting to conduct an analysis for Italy to test the sensitivity of rankings to the inclusion of various controls adjusting for some of the possible differences in circumstances. The data-set for Italy which we exploit in the current paper does not enable us to identify individual universities, but merely universities grouped into 9 university regions. Hence, an analysis of individual university performance is beyond the current study.

4. Selective survey of recent evidence for the UK

The various policy initiatives in the UK have stimulated a growth in the analysis of data on student behaviour and institutional performance. In this section, we offer a brief and highly selective survey of some recent work, focussing on drawing together results and conclusions from a series of papers which we have produced ourselves, in combination with other co-authors. This work has been enabled by the release to the academic community of the (anonymised) individual student records including the first destination data   for the cohorts of students leaving UK universities by the close of the academic year 1993. This release occurred with the closure of the USR   the Universities Student Record   and its replacement by HESA. There is not equivalent general access to the full individual records of HESA for cohorts of students leaving university more recently than 1993. The work to date focuses on four aspects of student outcomes or university performance: student drop-out behaviour, student degree performance, student first destination outcomes and derived Performance Indicators for individual universities. We comment briefly on the key findings in each of these areas before,

in the subsequent section, describing the results of new analysis on the issue of access and elitism in UK universities.

(a)   *Student withdrawal*

Given the argument recalled above that changes in the nature of funding UK students through university are likely to have had particularly adverse effects on the probabilities both of entry into university and of withdrawal from university for students from relatively poor backgrounds, Smith and Naylor (2001a) analyse the impact of, *inter alia*, the individual s social class background on the drop-out probability. The cohort studied is the class of students admitted to university in Autumn 1989, as this is the most recent cohort for which the relevant data are available. The USR data-set used in the analysis contains no information on individuals who did not attend university. Consequently, there can be no analysis of the decision on whether or not to attend university. Hence, the results are to be interpreted as conditional on students attending university. This is true of nearly all of the analysis currently conducted on the basis of the USR data. An exception is recent work which attempts to use external data to model the probability of attending university and using this information to correct for potential selection bias in the analysis of outcomes of students at university.

The student drop-out or withdrawal rate has been the focus of much more analysis in the US than in the UK. This may in part reflect the fact that the non-completion rate is much higher in the US (at almost 40%) than in the UK. Traditionally, the drop-out rate in the pre-1992 university sector was less than 10%. Currently, however, the rate is estimated to be approaching 20% in the expanded higher education sector. One of the most influential theoretical explanations of student attrition is the path analysis model of Tinto (1975, 1987). This model emphasizes the importance of the student s social and academic integration into the educational institution as the major determinant of completion, and identifies explanatory roles for student s family background, personal characteristics, previous schooling, prior academic performance and interactions between students and with faculty.

To capture any possible effects of social integration, Naylor and Smith (2001a) include control variables for whether the student lived on campus, off campus, or in the parental home, as well as various measures of the social mix of the university department in which the student studied interacted these with the individual s own characteristics. For example, investigating whether a female student s drop-out probability is influenced by the proportion of males in the university department. The results suggest evidence of externality effects for a number of particular sub-groups.

Following Tinto s (1997) suggestion that the effects of classroom activity and interactions might be important, Naylor and Smith also include proxies for teaching quality as embodied in the university s teaching quality assessment (TQA) scores, as these should reflect the effectiveness of the teaching relationship. The results suggest evidence that departmental and university characteristics exert significant influences on the individual s performance.

There is a widespread perception that, unlike in much of continental Europe, only a very small proportion of UK students continue to live in the parental home during their university careers. Hard evidence on the accuracy of this perception is not readily available. But it is interesting to examine the association between residence and the probability of drop-out. Smith and Naylor find that students who live at the parental address are around 2-2.5 percentage points more likely to drop out, and students who live off campus are around 5 percentage points more likely to drop out than are students who live on campus. These findings are consistent with the hypotheses of Tinto and others on the importance of social integration at university and suggest that, under the conditions of the UK system at least, campus-like conditions of accommodation have positive impacts on student progression.

Family background is likely to influence the university drop-out probability of a student for a number of reasons. First, it may influence the financial capacity of the student to complete their studies. Second, it is likely to condition the student s social

preparedness for and commitment to a college education. Third, the student s own post-college occupational aspirations are likely to be affected by parental experience and conditions which will, therefore, exert a further indirect effect on the student s likely completion probability. Thus, there is an important link between post-university career prospects (and the university student s perceptions of these) and the student s drop-out probability. This offers the prospect of a virtuous circle. If university reform is able to improve graduates career prospects it raises the possibility of raising the incentives for university registration and completion. For the UK, Smith and Naylor (2001a) find that students from professional backgrounds are indeed less likely to drop out of university, *ceteris paribus.*

Smith and Naylor (2001a) show that student drop-out behaviour is influenced by labour market conditions and, in particular, by unemployment in the county of prior residence. Students from counties with higher rates of unemployment are more likely to drop out of university. This is especially true for students from poorer backgrounds. One inference that might be drawn from this is that such students are more likely to perceive their post-university labour market destinations as close to or within the region of parental pre-university residence. The higher is unemployment in this region, the less rewarding seems to be the investment in university and hence the more marginal the attachment of such students to their university studies. In contrast, students from the same region but with a more advantaged family background are more likely to see their post-university prospects as developing outside the original parental residence and within a national labour market for university graduates. These more ambitious students are thus less sensitive to local labour market conditions in making their decisions regarding their on-going human capital investments. This possibility is of potential relevance to discussions of the Italian case, where typically, the geographical mobility of students, at least prior to graduation, is more limited than in the UK. Thus, the issue of the extent to which the graduate labour market in Italy is a national labour

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market is an interesting question, and one to which we return below.

Finally, we note that from the point of view of higher education reform in Italy it is interesting to note that Smith and Naylor (2001a) find that students taking a four-year degree are more likely to drop out than are students on three-year degrees. Furthermore, Smith and Naylor note that from a regression of the probability of dropping out in the first year alone, there remains a positive and significant effect associated with studying for a four-year degree, implying different behaviour even *within* the first-year group. This is consistent with the idea that reducing the required and/or permitted period of study for a degree may have a positive impact on the completion rate, other things being equal.

(b)   Student performance

Admission to university in the UK is based on a national system equating supply and demand. The implicit price in this quasi-market clearing system is the score achieved by the applicants in their pre-university qualifications: typically A-levels for applicants from England and Wales and Highers for Scottish and Irish applicants. All potential students complete a national application form administered by a central agency, UCAS, on which each applicant is restricted to a maximum of six individual university course applications. Many courses stipulate particular subjects which applicants must have taken in their A-level or Higher studies. For the courses in greatest demand, it is not uncommon for university departments to restrict the offers they make to only a small minority of applicants: departments filter applicants on the basis of a wide set of information contained on the completed UCAS application form. This information includes the candidate s performance (or predicted performance) in public examinations at ages 16 and 18, a personal statement by the candidate, and a reference from the school or equivalent prior educational establishment. In addition, some departments interview candidates and a very small minority set additional entrance examinations. Even after filtering students on the basis of all the UCAS form information, many departments set very high requirements on the

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A-level (or Higher) scores that applicants must achieve in order to win the award of a place. These required scores are often close to or equal to the maximum scores obtainable under the A-level/Higher marking schemes. In short, competition for places on the more popular university courses can be extremely fierce. As noted elsewhere in this paper, the higher education sector in the UK is very much a national one and this explains a significant part of the competitive nature of the university application process.

On the demand side, students have a number of strong incentives to win places on the most highly-reputed university courses. First, there is the *kudos* associated with educational success. Second, there is the likelihood that the institution s reputation reflects educational advantages that come from studying within its environment. Third, there is the expectation that post-university employment opportunities are beneficially advantaged by attendance at the more highly regarded institutions. On the supply side, universities have to equate demand with a fixed supply of places. One of the apparently fairest, and cheapest, ways of doing this is by using the A-level/Higher scoring system. This amounts to a policy of constrained maximisation of the scores of the admitted student population and hence, in the absence of systematic bias in these scores, of the academic potential of the students. In this way, the more popular   arguably the better universities succeed in recruiting the better students. The universities themselves have incentives for attracting the best possible students: especially with the development by the UK government of official indicators of university performance. The better students should be expected to have the lower drop-out rates, the better academic performance and, consequently, the greater success in the post-university graduate labour market.

The university application and clearing system, as described above, begs a number of key questions. A primary question here concerns the extent to which performance in prior qualifications, such as A-level, is associated with subsequent success at university (and, indeed, in the graduate labour market beyond). Typically, estimates of the correlation between A-level score and degree

classification in the UK have centred on a figure of about 0.3. Smith and Naylor (2001b), in an ordered probit model of degree class outcome, find that degree performance is very sensitive both to A-level score and to A-level subject studied. For the purposes of a comparison between the UK and Italy, it would be interesting to examine the correlation between score in the Maturità and in the university laurea (see section below).

Smith and Naylor (2001b) also examine the effects on university degree class outcomes associated with: gender, social class of family background and type of school attended prior to university. Gender is an interesting case not least because of policy discussions in the UK concerning the issue of gender differences in pupil performance in schools and public examinations. It is the cause of much concern that at many age levels the performance of boys is falling below that of girls. Smith and Naylor (2001b) find that the same is true, on average, at university: with the exception that male students are more likely than females to obtain the very top degree classification, *ceteris paribus*. On family background, the evidence is that performance at university is much better for students from professional and non-manual backgrounds, even after controlling for prior education and other causes of performance.

In the context of the debate on schooling effects (see, for example, Card and Krueger (1992) and Moffitt (1996)), it is interesting to note the statistically significant effect on student academic performance at university associated with the type of school attended prior to university. Smith and Naylor (2001b) show that performance is significantly and substantially worse for students who had attended a private rather than a state school prior to university (this result is also shown by McNabb, Sarmistha and Sloane, 1998). In Section 6 below, we examine how performance in Italian universities varies both according to the characteristics of the school previously attended and with the student s prior educational attainment level.

(c)   First destination outcomes

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Smith, McKnight and Naylor (2000) use a binomial probit model to examine the determinants of the first destination outcome of university leavers 6 months after graduation. Again the data used refer to the full population of 1993 leavers. In related work, Naylor, Smith, and McKnight (2001) analyse the occupational earnings of employed graduates in their first destinations. Smith, McKnight and Naylor (2000) distinguish between the following types of outcome: Employment, Further study, Unemployment and seeking work or further study, and Inactivity (unavailable for work or further study). The results of the analysis reveal that the probability of unemployment or inactivity six months after graduation is influenced strongly by various characteristics including: (i) the individual s level of performance in their degree (i.e., their *class* of degree), (ii) the degree subject, (iii) pre-university qualifications and academic performance, (iv) gender and (v) Social Class background.

Again, the results provoke the question of the extent to which these findings would be replicated in the case of the transition from university to the labour market in the case of Italy. In Section 6, we examine the effects of these factors on the quality of the labour market outcomes for Italian university graduates.

In analysing occupational earnings, Naylor, Smith, and McKnight (2001a) report very large differences according to the degree subject studied. An interesting question concerns whether differences across university degree subjects in the post-university labour market are greater or smaller in Italy compared to the UK. We comment on this in Section 6 below. Naylor, Smith, and McKnight (2001a) focus on this issue for the UK given its centrality in the question of the extent to which students can afford to pay more towards their higher education costs. As we have seen above, estimates of the average earnings premium for a degree in the UK are large. But if there is considerable variation around the average, then raising costs to the student will risk discouraging participation especially from the poorer sections of the community. Furthermore, Naylor, Smith, and McKnight (2001a) show a clear social gradient in occupational earnings of

graduates, even after controlling for the other observable factors. There is also a sizeable and significant premium for students who had previously attended a private school. For a more detailed discussion of the private school premium, see Naylor, Smith, and McKnight (2001b).

(d)   *University Performance Indicators*

As indicated above, the UK government has introduced the publication of a set of indicators of university performance. Before the introduction of these official PIs, potential students and other stakeholders in the higher education sector   such as potential employers   had access only to unofficial league tables collated and published in various press and media. In many respects, the official PIs can be thought of as an attempt to publish more sophisticated league tables of university performance than those previously disseminated through unofficial channels. The use of league-tables in quasi-market sectors such as health and primary and secondary education is well-established   if controversial   in the UK. In higher education, the universities themselves have been traditionally sensitive about the unofficial league table publications, arguing justifiably that they do not take account of important differences across universities that are likely to impact on their performance against the imposed criteria. The main point about the construction of a valid indicator is to take proper account of such differences in order to compare universities on a like-for-like basis.

In the context of graduates post-university outcomes, Smith, McKnight and Naylor (2000), extending the Johnes and Taylor (1990) framework to the case of individual student-level data, provide a methodology for the construction of university PIs and league tables. They produce a league table on the basis of the 1993 leavers data and examine the statistical properties of the ranking. In their conclusions, they emphasise the importance of adjusting for relevant differences in university characteristics in the evaluation of the performance of higher education institutions, as failure to make such adjustments can lead to very different and potentially misleading institutional rankings. It would be interesting

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to investigate whether this conclusion is also valid in the case of Italian universities. As we discuss in Section 6 below, the Italian data we exploit in our study not only conceals the identity of the individual university attended by each student, but also aggregates up the university affiliation to the level of a 9-region university grouping. Consequently, we cannot undertake inter-university comparisons, even on an anonymous basis. A second conclusion is that the ranking of universities is not well-determined statistically. Of about 60 universities in the analysis, three-quarters are ranked statistically insignificantly from the median in their effects on the graduate unemployment probability. Very similar conclusions emerge from an analysis of university performance in the context of the student dropout or withdrawal probability conducted by Smith and Naylor (2001) and (in the case of medical students) by Arulampalam, Naylor and Smith (2001).

As discussed above, in Italy league tables of universities by general faculty are widely disseminated through newspaper publications. One of these sets of league tables is generated by Censis Servizi and is related to a project on the evaluation of Italian universities. It would be interesting to compare UK and Italy results on the statistical analysis of performance indicators for both raw and adjusted measures. However, as implied above, such an analysis will need to use data in which the institutional affiliation is not aggregated to the higher level of university region/group as in the data exploited in the current study.

(e)   *Policy implications*

The recent evidence for the UK generates a number of policy implications. The most obvious concerns the choice of methodology for the construction of performance indicators for higher education institutions. The analysis of individual-level data on university students provides one possible method for extracting measures of university effects. The work surveyed shows that the derived measures differ substantially from measures calculated simply from the raw data, which fail to take account of various differences across universities in the characteristics of students or in other factors and circumstances.

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A second policy implication regards university access. Performance at university has been shown to depend not only on the individual s personal record of educational achievement prior to university, but also on the type of school they attended. In particular, students who had previously attended fee-paying private schools perform substantially worse at university compared to most other students, *ceteris paribus*. This suggests that university admissions procedures which fail to allow for the possibility that students educated in private schools may have their level of prior qualifications artificially but only temporarily boosted, will fail to recruit the most able students.

The focal point of recent discussion and debate regarding the extent to which UK universities are socially elite has been the figure for the percentage of university students educated at (fee-paying) Independent schools. Between 7% and 10% of all UK school pupils attend an Independent school. Yet the proportion of UK university students from the Independent school sector is much higher than this at around 25%. If one focuses on the leading UK universities, it emerges that there are 6 in which the percentage of students from the Independent sector is greater than 40% and 15 with at least 30%. It has been suggested that the fact that these figures are so much higher than the 7% - 10% figure for the entire school population is itself proof of unfair discrimination against potential students from the non-Independent sector. But it is not obvious that the 7% - 10% figure represents the appropriate benchmark. University students are awarded competed places on the basis of their A-level performances. At the top universities, it is necessary to score highly in order to be offered a place. One could then suggest that the appropriate benchmark is the proportion of Independent-educated pupils within the population of pupils obtaining sufficiently high grades to merit a place at a top university. We take this A-level points score to be 28 out of 30. From the individual-level USR data-set, we are able to calculate the proportion of students from Independent schools in the population of students with at least 28 points. This proportion is 36%. Against this benchmark, we conclude that Independent-

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educated students are over-represented at the top UK universities, albeit less disproportionately than implied by a crude application of the 7% - 10% benchmark.

We point out, however, our belief that the 36% benchmark itself should be regarded as an upwardly biased estimate of the most appropriate benchmark. This is because A-level performance is likely to be a biased estimate of the ability of potential university students, with Independent-educated students likely to perform better at A-level than otherwise equivalent students from state schools. For a detailed discussion and evidence on this point, see Smith and Naylor (2001a).

5.   Data and evidence for Italy

In recent years there have been a number of papers devoted to the analysis of Italian university students. Typically, the focus of this work is on the issue of the transition from university to the labour market. Papers that we are aware of include Checchi (2001), Puggioni (2001), Bratti and Staffolani (2001), Staffolani and Sterlacchini (2001), Vitale (1999) and Ghirardini and Pellinghelli (2000). Each of these papers analyses data on individual students from particular universities (or university regions). In addition, ISTAT has conducted analyses of surveys of samples of graduates from all universities (see, for example, ISTAT, 1999). Finally, the recent work of Censis is a further example of the high level of interest and policy relevance of this growing literature.

The recent work has focussed mostly on issues such as the ease and speed of transitions into jobs, the process of job search, the relationship between the degree course and the skills needed in the jobs held, and on the determinants of graduates pay. Checchi (2001) examines a number of issues relating to the studies and labour market outcomes of graduates of political science of the university of Milan. In particular, he estimates both an earnings equation and an equation for the determinants of the period of time between graduation and occupational entry. Among other findings, he reports significant influences on earnings of type of

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school attended prior to university, faculty attended, specific skills acquired. Interestingly, the score in the Maturità is not a significant influence on earnings. This result is very different from that for the UK, where A-levels have a persistent effect on both performance at university and outcomes in the post-university labour market, *even after controlling for university degree class*. Degree score is significant in some of Checchi s specifications, but ceases to be significant when controls for workplace characteristics are also included.

Bratti and Staffolani (2001) analyse the factors that influence the academic performance and the choice of the faculty attended, using data from the IPLAM (Inserimento Professionale Laureati Atenei Marchigiani) survey. The survey was conducted in November-December 1997 and January 98 on all students who graduated in 1992 from the four universities of the Region of Marche (Ancona, Camerino, Macerata and Urbino). The results of this study indicate a significant influence of the individual s social background on academic performance. Moreover, among other conclusions, the study points to a number of 'inertial' factors that strongly influence the choice of the degree course, like the type of secondary school attended prior to university. Also, the authors find that 'rational' factors, such as the expected performance, plays a significant role on the choice of the faculty. Puggioni (2001) examines issues related to the performance of students of the University of Cagliari. In particular, Puggioni evaluates the effective input (effort), measured in terms of hours of study (translated into credits), required for the students to successfully pass each exam.

Staffolani and Sterlacchini (2001), using the same data set as Bratti and Staffolani (2001) (that is, the IPLAM survey) for the four universities of the Marche, examine issues of transitions into jobs and the determinants of graduates earnings. Unlike the findings of Checchi (2001), but in line with results for the UK, Staffolani and Sterlacchini (2001) found that the score in the Maturità has a significant impact on earnings (and on the probability of being employed). In particular, they find that

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earnings are positively correlated with the score in the Maturità and negatively correlated with the effective time needed to achieve the *laurea*. Among other important determinants of earnings they report gender, family, social and educational background and previous work experiences during the period of university study. Finally, Staffolani and Sterlacchini (2001) report the significant influence of the period of time between graduation and occupational entry on earnings, and also find that faculty, gender (women take three months more than men to find their first job) and family background play an important role. Among other policy proposals, Staffolani and Sterlacchini (2001) indicate the potential value and importance of the reduction of the length of the university courses, which is a major change in the current university reform, and the need for establishing more frequent links with industrial schemes during the student s period of university study.

In 1998, ISTAT (see ISTAT, 2000) conducted the fourth and most recent in a series of surveys on the transition of Italian graduates into the labour market. The objective of the survey is to analyse the occupational position of graduates three years after the completion of their university studies. Accordingly, the 1998 survey is conducted on those graduating in 1995. The graduate population of 1995 consisted of 105,097 individuals (49,393 males and 55,704 females). The ISTAT survey was based on a 25% sample of these students and was stratified on the basis of university attended, degree course taken and by the sex of the individual student. The response rate was about 67%, yielding a data-set containing information on 17,326 graduates. The data contain information on: the curriculum studied up to graduation in 1995, the occupational status and related work details by 1998, the search processes used between 1995 and 1998, the student s family background and personal characteristics.

The ISTAT Annual Report of 1999 provides an analysis of various aspects of the transition process between university and the labour market, largely from an examination of the summary statistics on the 1998 survey. There is also a logit model analysis of

the probability that an individual worker will be in a job and a linear regression analysis of monthly earnings. The results indicate that there are significant differences across faculties in the probability of graduates being in employment 3 years after graduation. Graduates in Economics/Statistics and in Engineering have the highest employment probabilities. Type of school also has an influence, but the degree score (as measured by the average score across courses) does not. Family background, as indicated by the father s occupation, has weak effects. Marital status and gender are both significant, with married men most likely to be in employment. There are enormous differences according to region of residence. With respect to monthly salary, again there are large and significant differences across faculties and here degree score does have a significant positive effect. Father s occupational background has significant effects. Again, region of current residence shows enormous regional differences, with earnings in the north-west over 20% higher than in the Mezzogiorno, *ceteris paribus*. Men earn about 10% more than women, other things constant, once occupational status is controlled for.

6. New evidence for Italy

In this section of the paper, we present the results of econometric analyses exploiting data from the 1998 ISTAT survey of 1995 graduates. We focus on two issues. First, we examine the determinants of academic success as indicated by the score (voto) in the laurea. Second, we examine the determinants of the (log) of net monthly pay of employed graduates. Table 1 presents relevant summary statistics for the population of students who studied for their first degree, where that degree was marked out of a maximum score of 110. We see that 42% of responding students were male, 30% were married by the survey date in 1998, 2% were non-Italian (of whom most were from other EU countries) and the average age was 26 years and 8 months. With respect to other characteristics of the students, about one-third of male students carried out their military service obligations at university while 7%

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completed prior to university. Turning to educational performance of students, the mean reported degree score was 104 out of 110. This seems somewhat high. There are various reasons which might explain this. First, unlike the UK data used by Smith and Naylor (2001a) and others, all the information in the Italian data set is provided by the surveyed students: it is not derived from matched administrative data. Thus, there is likely to be a potential upward bias in the reported level of educational attainment. Second, the survey response rate was about two-thirds: it is likely that the responding population is not random but contains disproportionately more students who performed well at university. In contrast, however, the score (out of 60) in the Maturità seems reasonable, at an average of 49 points, especially since the students in the selected population consist exclusively of students who successfully completed their university degree: again this is likely to have been an unrepresentatively well-qualified group of students.

Table 1 also records the fact that 32% of students in the sample population had moved from the parental home in order to attend university. Compared to the UK, this is a remarkably low figure. In the UK, about 92% of students at university live away from the parental home and, indeed, only about 12% study at a university within one of the same 10 standard regions as the parental home. Table 2 also shows the accommodation type for the 32% living away from home. From the table, we also see that 56% of students carried out some form of labour market employment during their registration period at university and that the mean years registered for a degree was 7.4 years   considerably higher than in the UK where the overwhelming majority finish within either the three or four year period specified under most course regulations. Students satisfaction with teaching quality is also recorded in the table. On a scale in which 1/2/3/4 represents high/average/low/very low levels of satisfaction, the typical average level recorded by students is close to 2 against five individual criteria: competence, clarity, punctuality, presence and engagement with students in the academic relationship.

Table 1 also gives the breakdown of students by: type of Maturità, university (by regional group), broad degree subject area and by region of actual residence in 1998. Of the 16,370 students in the selected sample, 72% were in employment in 1998. Of these 16% worked part-time. Of those recording a figure for their net monthly pay, the average was just over 1.8m lire. Approximately two-thirds were employed in the private sector.

Finally, Table 1 also shows the average Maturità score by university region. The table shows a remarkable degree of homogeneity. Of course, it is likely that this reflects in part the aggregation of universities to the level of the region: within each region the Maturità score is likely to vary across universities. It would be interesting to examine this variation, but this is not possible within our data-set. Nonetheless, the evidence provides convincing support for the view that Italian universities are far more homogeneous in their intake than are UK universities. Of course, if rationing student numbers on degree programmes in Italy becomes more prevalent, this high degree of homogeneity might weaken: at least, in the absence of strategies to address the issue of the fairness and efficiency of the allocation of students across the university sector.

(i)   Determinants of degree performance

The analysis focuses on the determinants of the score in the laurea where, for most students, the score is represented by a continuous variable with an upper limit of 110. The top-performing students receive the additional award of *con lode* in their degree. We reiterate the point made earlier that the sample is drawn from students successfully obtaining their degree and thus omits failing students or students who drop-out of university. Thus, our measure of performance is conditional on successful graduation. Following Smith and Naylor (2001a, 2001b), we hypothesise that the student s level of performance at university is influenced by various sets of characteristics. These include: academic preparedness, personal characteristics and characteristics of the subject studied and of the processes and locations of study.

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Table 2 presents the results of an OLS regression of degree score against such sets of characteristics.

From Table 2, we can see that male students performed significantly worse than female students, *ceteris paribus*. All other things constant, a male scores over half of a point less than a female student. This echoes the similar result established for the UK. Students married by 1998 and non-Italian students also perform less well than their non-married and Italian counterparts, respectively. Performance is significantly and monotonically deteriorating in age, but is surprisingly insensitive to family background characteristics. Only a small number of parental background factors appear to be significant: a very different result from that reported for the UK in Smith and Naylor (2001a). Students do better if, when they were 14, their father had a professional qualification, and if their father was either a university academic or a teacher. The Table reports only the set of significant estimated coefficients. A wide range of other parental background characteristics were included in the regression.

After controlling for the effects of all the other included regressors, there is strong evidence that degree score varies substantially across the broad subject area of study. Relative to the default case of Politics and Social Studies, the degree score is significantly different at the 1% significance level in all but 4 of the other 14 subject areas, with a range of over 6 points between the highest and lowest. Similarly, relative to students at university in Emilia-Romagna, performance is significantly different for students at all but one of the other university regions   with a span of over 3 points   even after controlling for factors such as subject area and prior qualifications. Whether this indicates use of differential standards across the different institutions or genuine institutional differences in value-added cannot be identified from the data.

There is evidence of a highly significant (and quadratic) effect of score in the Maturità and degree score. On average, a three point increase in the score at the Maturità leads to a one point rise in the degree score. Type of Maturità taken prior to university also

has a statistically significant effect on degree performance. Relative to a student who had taken a Classical Maturità, the degree score was lower for all other types of student, although by quantitatively varying amounts according to the exact Maturità type taken. For example, students who had taken a Scientific Maturità ultimately attained a degree score only one-quarter of a point below that of former Classical Maturità students, on average. We also calculated that the correlation between degree score and score in the Maturità was about 0.36: much higher than that between A-level scores and degree outcome of UK university students.

Table 2 also shows that students who moved away from the parental home typically performed less well at university than did students who stayed at the family home: for all six of the various accommodation types. Students on longer courses tend to score more highly than others, but given official course length, the longer students take to complete their degree course the lower is the degree score. For example, relative to students who finish after five years, degree score is lower by 0.6 (1.3, 1.8, 2.1, 2.9, 3.7) points for students who completed after 6 (7, 8, 9, 10, 11 or more) years. Relative to students with poor attendance at lectures, students who attended lectures frequently tended to perform better. Additionally, students who paid for private tuition to complement their studies scored, on average, one degree point higher. The students recorded levels of satisfaction with their studies had relatively little effect on their degree performance. However, those reporting that their lecturers were available and committed to their students performed significantly better than those who were less satisfied with their lecturers on this criterion.

In sum, we have found that our measure of degree performance by students graduating from Italian universities in 1995 was influenced significantly by various sets of factors including: personal characteristics (age, gender, nationality, status of military obligation), prior educational attainment (Maturità score and type), degree subject area, university (by regional group), and by factors pertaining to the students studies (such as accommodation, time registered, intensity of study, satisfaction with teaching). Very

different from the evidence for UK university students, surprisingly few of the estimated parameters on a wealth of family background characteristics were found to be significant. Finally, we note that the estimated equation shows a reasonably good measure of fit with an R^2 of 0.36.

(ii)   Determinants of graduates' net monthly pay

In this section of the paper, we present the results of an OLS regression of the log of net monthly pay of employed graduates. In future work, we propose to address the question of what determines the probability of employment. For now, our results for graduates pay determination are to be interpreted as conditional on employment.

From Table 1 we saw that the average net monthly pay of 1995 graduates is just over 1.8m lire in 1998. Table 3 presents the results of the OLS regression of the log of net monthly pay against similar groups of variables as those used in the analysis of degree performance described above. Additionally, we also include measures of degree performance and exploit information on the experiences of the graduates in the 3 years between graduation in 1995 and the point at which the survey was conducted in 1998. This information includes data on post-university training both on and off-the-job and on job tenure. There is also attitudinal information on issues such as the relevance of the degree obtained for the job undertaken. The estimated equation shows a good measure of fit with an R^2 of 0.46.

From Table 3, we see that, *ceteris paribus*, employed male graduates earn about 3% more than female graduates 3 years after graduation. There is a premium for being married of about 2% and earnings increase with age. There is some evidence that family background characteristics influence post-university earnings. Graduate earnings are higher for students whose fathers were highly qualified and whose mothers were employed in various professional and highly-skilled occupations. Male graduates earnings are influenced significantly by military service obligations: given length of study, earnings are highest for students who either completed military service prior to graduation or who have been

exonerated from serving. There is evidence of a pay penalty for students still having to perform military obligations after graduation. Students who were employed in the labour market while studying receive a graduate pay premium of over 2.5%. This might reflect an employer preference for graduates with work experience.

There are significant differences in graduate pay 3 years after graduation according to subject studied at university, even using the highly aggregated set of 15 broad subject areas. Relative to students of Politics or Sociology, Medical students are in receipt of a pay premium of over 20% three years after graduation. The equivalent premium for Engineering students is about 14% and that for Chemistry/Pharmaceutical students is 12%. There is a premium of about 6% for students of Economics/Statistics relative to Politics/Sociology students. Conversely, Literature students are paid about 6% less than the latter and there are also negative premia associated with the study of Education, Literature, Law and Architecture. In the latter two cases, it is likely that these early-career earnings are not representative of the likely profile of prospective lifetime earnings.

In contrast, there are surprisingly few significant effects on graduate pay associated with the region of university attended. This is true both with and without the inclusion of controls for actual region of residence. Relative to students who studied at university in Emilia-Romagna, graduates of universities in Lazio (Lombardia) earn about 10% (5%) more three years after graduation, *ceteris paribus*. There are no other significant effects.

With respect to the impact of pre-university qualifications on graduate pay, we saw in Section 4 that UK university graduates receive first destination earnings which are influenced significantly by their pre-university A-level performance. In contrast, score in the Maturità has no effect on graduate pay. One possible reason for this difference is that UK university students often obtain graduate job offers prior to graduation with employers basing offer decisions on A-level scores. In Italy, degree score is more commonly known   or accurately predictable - at the point of the

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job offer decision and hence pre-university educational performance is likely to be less influential. Furthermore, there is anyway a higher correlation between Maturità and degree score in Italy than between A-level and degree outcome in the UK. We also note from Table 3 that the type of Maturità taken has almost no effect on graduate earnings: with a small pay premium only for students who had taken a Technical/Industrial Maturità.

More surprisingly, whilst a graduate s degree performance in the UK is a significant   and quantitatively substantial   influence on graduate earnings, the score in the Maturità has an insignificant impact on graduate earnings in Italy. Whether the student graduated *con lode*, however, has a significant effect   albeit one of raising earnings by only about 2%. We note that the effects of degree and of Maturità score were insignificant even when control variables for contract type, occupation and industry were excluded from the regression equation.

Whereas Table 3 reported a significant impact of geographical transfer and accommodation type on degree performance, there are no effects on graduate pay from these variables. This is perhaps surprising as one might have expected the more mobile students to command a superior labour market outcome after university. In contrast there is evidence that, on average, students who took longer to graduate receive lower earnings: although an adverse effect appears only for students who take more than 7 years to graduate. Students who reported a high level of attendance at lectures at university   and who therefore obtain a better degree score, according to the results reported in Table 2   earn less than other students, *ceteris paribus*. Given degree score, these students may be less able than other students and hence the sign of the estimated effect on earnings. In contrast, there is no effect on earnings associated with having paid for extra private tuition while at university.

With respect to employment characteristics, graduate pay varies with contract type and with hours of work: part-time workers receive about 30% lower net monthly earnings and there is a pay premium of about 8% for workers who work more than 40 hours

per week. There are no significant effects associated with tenure three years after graduation. The amount of training received since employment began, however, does have a significant effect. Relative to graduates with no training since employment began, students with more than four months training earn about 7% more. Graduates working in jobs in which a non-specialist degree was a pre-requisite earn about 8% more than graduates in jobs with no degree requirement. The more specialist the degree requirement, however, the smaller is any such premium over graduates in jobs with no degree requirement.

As is usually found to be the case, the data reveal a well-determined and monotonic effect of establishment size on earnings: for example, pay is about 16% higher for those working in establishments with more than 100 workers than for those with 2-5 workers. Controlling for industry and occupation, private sector employees earn about 3% less than public sector workers. Finally, we note that region of actual residence has surprisingly few effects on graduate pay with the striking exception of living in the Lazio region where there is a pay penalty of over 9% relative to graduates living in Emilia-Romagna. This almost exactly offsets the positive pay premium associated with having studied at university in the Lazio region and hence, with low mobility, the two effects will cancel out in most cases.

In summary, we have found that graduate pay in Italy is influenced significantly by a variety of factors including: personal characteristics (age, gender, marital status, status of military obligation), broad subject area studied, years of study prior to graduation, and employment characteristics (such as training and size of establishment). Most surprisingly, and in stark contrast to the results for the UK, educational attainment appears to have little effect on graduate pay: score in the Maturità is insignificant, as is type of Maturità taken. Furthermore, degree score has no significant effect on graduate earnings. Only graduating *con lode* establishes a pay premium over other students.

7.   Conclusions

In this paper, we have provided a selective review of recent empirical analyses of higher education outcomes for both UK and Italian university students. We have focused on those outcomes and characteristics most pertinent to current policy discussions in the two countries. We have also presented the results of new analyses for both countries, especially in the case of Italy. For the UK, we have presented new results relating to the issue of elitism in the higher education sector in the UK. For Italy, we have analysed the determinants of degree performance and of graduate earnings exploiting ISTAT data on 1995 graduates. We have highlighted the contrasts and similarities between our results for Italy and those established for the UK. Among other results, for example, we have found that on average, as in the UK, university performance by male students in Italy is weaker than that of females and varies considerably across degree subject area and by university region. Also consistent with evidence for the UK, degree performance in Italy is influenced strongly by prior educational characteristics, such as score in the Maturità and type of Maturità taken. Unlike in the UK, graduation in Italy is a lengthy process, with length of registration associated with a significant negative effect on performance. Similarly, students in Italy who transfer to a university outside their own region perform less well than other students. This feature is also different from the UK where far more students move away from the parental home in order to study, as we have documented.

With respect to the determinants of graduate earnings, results for the UK show a strong dependence on the level of educational attainment both prior to and at university. In sharp contrast, the results presented in the current paper suggest that neither the Maturità score nor the degree score influence graduate earnings: only graduating *con lode* generates a graduate pay premium for Italian students. As in the UK, there are large pay differences according to the degree subject area studied in Italy but, unlike the UK, relatively few differences by university attended (as measured by university region). Students taking longer to graduate in Italy

especially those taking more than seven years   earn significantly less than those graduating more quickly.

Finally, we note as a caveat that the nature of the data exploited for the analysis of Italian university graduates differs substantially from that used in the UK studies reviewed and conducted in the present paper. Each of the two country data-sets has its respective merits. We also believe that analysis in this general area would be greatly facilitated and its policy usefulness greatly enhanced if those responsible for data collection and dissemination in each of the two countries were to borrow from their counterparts. For example, there are two major limitations with the UK data-set exploited in the work reported in the current paper with respect to the analysis of graduates labour market outcomes. The first is that to date there is no information on graduates actual earnings: analysis has had to impute earnings from occupational averages. Second, the first destination survey of graduates provides information on the labour market characteristics of graduates only six months after graduation. In contrast, the Italian data-set exploited here has (banded) individual earnings information relating to the graduates labour market status three years after graduation. On the other hand, the UK data-set has a number of features which, if copied, would significantly enhance the power of the Italian data. First, the UK survey-based information on the labour market characteristics of graduates is matched to administrative data on the individuals university records (for all students in each cohort) and this includes reliable information both on performance and related characteristics of the students while at university and on pre-university characteristics recorded on the university application form, such as performance in public examinations (for example, A-level subjects and scores). Second, because of this matching approach, the UK data contains information not only on students who graduated successfully, but also on students who failed to complete their courses. This enables an analysis of the drop-out probability that is not possible from the Italian data-set used in the present study. Consequently, our

reported results for Italy have to be interpreted as being conditional on successful graduation.

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Table 1	Obs	Mean	Std. Dev.
Summary statistics			
Personal Characteristics			
% male	13517	0,4249	0,4943
% married	16370	0,3002	0,4584
% non-Italian	16370	0,0195	0,1384
% rest of EU	16370	0,0159	0,1250
% non-EU	16370	0,0037	0,0604
Age	13694	26,6634	1,9820
Military service			
Completed pre-univ	5743	0,0688	0,2531
Completed at univ	5743	0,3235	0,4679
Completed after univ	5743	0,3005	0,4585
Underway	5743	0,0068	0,0821
Not yet started	5743	0,0075	0,0862
Exonerated	5743	0,2929	0,4551
Degree study			
Degree score (out of 110)	16370	104,0285	6,7094
Maturita score (out of 60)	16370	48,6595	7,3436
% changed course	16370	0,1039	0,3052
% moving from home to un	16370	0,3200	0,4665
To owned accomm	16370	0,0239	0,1529
To rented accomm	16370	0,2298	0,4207
To hostel	16370	0,0192	0,1374
To student hostel	16370	0,0283	0,1658
To friends/relatives	16370	0,0125	0,1109
To other	16370	0,0063	0,0791
% students employed at un	16370	0,5629	0,4960
Years registered for degree	16370	7,4158	3,0149
Satisfaction with studies			
Competence	14403	1,5689	0,6801
Clarity	14271	1,9753	0,8174
Punctuality	14180	1,8764	0,8891
Presence	14043	2,3326	0,9786
Availability /commitment	14263	2,3086	0,9946

Tab. 1 Cont	**Employment**		
% graduates in employment	16370	0,7173	0,4503
% employed part-time	10964	0,1614	0,3680
Net monthly pay	10392	1815295	664011
% employed in private sector	7019	0,6595	0,4739
	Year employment began		
1995	9371	0,1397	0,3467
1996	9371	0,2898	0,4537
1997	9371	0,3077	0,4615
1998	9371	0,2628	0,4402

Table 1	(cont.)	Freq.	Percent	Cum.
	Type of maturita			
1	Scientifica	6402	39,11	39,11
2	Classical	3517	21,48	60,59
3	Tech/industrial	970	5,93	66,52
4	Tech/Geometry	501	3,06	69,58
5	Tech/Commercial	2025	12,37	81,95
6	Other Technical	376	2,3	84,25
7	Magistrale	1197	7,31	91,56
8	Linguistic	632	3,86	95,42
9	Professional	413	2,52	97,94
10	Artistic	116	0,71	98,65
11	Other	221	1,35	100
	University region			
1	Piemonte/Liguria	1455	9,52	9,52
2	Lombardia	2156	14,1	23,62
3	Trent/Ven/Giulia	1741	11,39	35,01
4	Emilia-Romagna	2018	13,2	48,21
5	Tosc/Umb/Marche	1947	12,74	60,94
6	Lazio	1490	9,75	70,69
7	Abr/Mol/Campania	1705	11,15	81,84
8	Pug/Bas/Calabria	1147	7,5	89,34
9	Sicilia/Sardegna	1629	10,66	100
	Broad degree subject area			
1	Science	1019	6,42	6,42
2	Chem/Pharm	1009	6,36	12,78
3	Geo/Biology	1091	6,87	19,65
4	Medicine	1158	7,3	26,95
5	Engineering	1558	9,82	36,76
6	Architecture	433	2,73	39,49
7	Agriculture	478	3,01	42,5
8	Economics/Stats	2800	17,64	60,14
9	Politics-Sociology	996	6,28	66,42
10	Law	1946	12,26	78,68
11	Literature	1592	10,03	88,71
12	Languages	1090	6,87	95,58
13	Teaching	471	2,97	98,54
14	Psychology	231	1,46	100

		Region of actual residence		
	Piemonte/Liguria	1688		10,68
2		2134	13,51	
3	Trent/Ven/Giulia		12,34	36,53
	Emilia-Romagna	1687		47,2
5		1784	11,29	
6	Lazio		8,71	67,2
	Abr/Mol/Campania	1801		78,6
8		1776	11,24	
9	Sicilia/Sardegna		10,16	100

	Maturity score		
University region	Obs	Mean	Std. Dev.
Piemonte/Liguria	1455	48,8117	7,0276
Lombardia	2156	48,4777	7,1368
Trent/Ven/Giulia	1741	48,2539	7,3304
Emilia-Romagna	2018	48,5292	7,2503
Tosc/Umb/Marche	1947	49,1171	7,5098
Lazio	1490	49,6181	7,4961
Abr/Mol/Campania	1705	48,4745	7,3712
Pug/Bas/Calabria	1147	48,6722	7,0614
Sicilia/Sardegna	1629	48,0700	7,5318

Table 2	Dependent variable: Degree Score			
	Coeff	s.e.	t-stat	p-value
Constant	79,1494	2,1509	36,798	0,000
Personal Characteristics				
Male	-0,5663	0,1185	-4,777	0,000
Married	-0,5035	0,0954	-5,279	0,000
Non-Italian	-0,5622	0,3055	-1,840	0,066
Age 25	-0,2420	0,1790	-1,352	0,176
Age 26	-0,5511	0,2006	-2,747	0,006
Age 27	-0,6985	0,2316	-3,016	0,003
Age 28-29	-0,9575	0,2336	-4,098	0,000
Age 30+	-1,0872	0,2493	-4,361	0,000
At 14, educational attainment of father				
Prof Qual	0,5351	0,1903	2,812	0,005
At 14, employment status of father				
Employed	0,1876	0,2045	0,918	0,359
Father's occupation				
Univ Academic	1,0250	0,3966	2,584	0,010
Teacher	3,5461	1,3540	2,619	0,009
At 14, educational attainment of mother				
Prof Qual	-0,0809	0,1905	-0,425	0,671
At 14, employment status of mother				
Employed	0,1189	0,0942	1,262	0,207
Mother's occupation				
Univ Academic	0,8682	0,8176	1,062	0,288
Teacher	-1,8043	0,8383	-2,152	0,031
Military service				
Completed at univ	-0,8773	0,1594	-5,503	0,000
Student employed	0,0097	0,0928	0,105	0,916

	Broad Uniiversity Subject Area			
Science	-2,1253	0,2554	-8,321	0,000
Chem/Pharm	-2,4182	0,2710	-8,924	0,000
Geo/Biology	0,4501	0,2465	1,826	0,068
Medicine	-0,5913	0,3795	-1,558	0,119
Engineering	-2,7506	0,2873	-9,575	0,000
Architecture	1,9920	0,3698	5,387	0,000
Agriculture	-0,4022	0,3432	-1,172	0,241
Economics/Stats	-2,3414	0,2078	-11,267	0,000
Law	-3,3996	0,2180	-15,595	0,000
Literature	3,4347	0,2251	15,260	0,000
Languages	2,3514	0,2450	9,599	0,000
Teaching	4,4577	0,3175	14,038	0,000
Psychology	-0,0563	0,4304	-0,131	0,896
Course change	0,6304	0,1445	4,363	0,000

Table 2 (cont.)	Coeff	s.e.	t-stat	p-value
University (grouped by region)				
Piemonte/Liguria	-0,6162	0,1902	-3,239	0,001
Lombardia	-1,4232	0,1696	-8,392	0,000
Trent/Ven/Giulia	-0,0739	0,1814	-0,407	0,684
Tosc/Umb/Marche	1,9295	0,1745	11,059	0,000
Lazio	1,5609	0,1886	8,275	0,000
Abr/Mol/Campania	0,4894	0,1828	2,677	0,007
Pug/Bas/Calabria	1,2474	0,2050	6,085	0,000
Sicilia/Sardegna	0,8606	0,1853	4,643	0,000
Prior qualifications				
Maturita score	0,4702	0,0821	5,726	0,000
Maturita score sqd	-0,0019	0,0008	-2,313	0,021
Maturita type				
Scientifica	-0,2697	0,1213	-2,224	0,026
Tech/industrial	-0,8871	0,2125	-4,174	0,000
Tech/Geometry	-1,7174	0,2789	-6,157	0,000
Tech/Commercial	-1,6510	0,1666	-9,908	0,000
Other Technical	-1,6374	0,3014	-5,432	0,000
Magistrale	-1,2121	0,1958	-6,191	0,000
Linguistic	-0,9619	0,2500	-3,848	0,000
Professional	-2,1836	0,2884	-7,572	0,000
Artistic	-1,1310	0,5248	-2,155	0,031
Other	-1,5055	0,3790	-3,973	0,000
Residence type after geographical transfer				
To owned accomm	-0,4514	0,2798	-1,613	0,107
To rented accomm	-0,7870	0,1073	-7,336	0,000
To hostel	-1,2854	0,3115	-4,126	0,000
To student hostel	-1,2079	0,2611	-4,626	0,000
To friends/relatives	-0,8967	0,3827	-2,343	0,019
To other	-1,3971	0,5362	-2,605	0,009

	Length of study			
Course length	1,8793	0,1679	11,191	0,000
	Actual years taken to complete			
4 years	0,1018	0,2155	0,472	0,637
6 years	-0,6141	0,1426	-4,307	0,000
7 years	-1,3045	0,1684	-7,745	0,000
8 years	-1,7538	0,1983	-8,844	0,000
9 years	-2,1373	0,2252	-9,490	0,000
10 years	-2,8888	0,2374	-12,171	0,000
11+ years	-3,6590	0,2375	-15,405	0,000
	Intensity and satisfaction with studies			
Median attendance	0,5151	0,2961	1,739	0,082
High attendance	0,9246	0,3551	2,604	0,009
Private tuition	1,1445	0,1748	6,546	0,000

Table 3	Dependent variable: log of net monthly pay			
	Coeff	s.e.	t-stat	p-value
Constant	14,2146	0,5972	23,802	0,000
Personal Characteristics				
Male	0,0275	0,0105	2,621	0,009
Married	0,0218	0,0064	3,409	0,001
Non-Italian	-0,0135	0,0200	-0,674	0,500
Age 27	0,0075	0,0114	0,653	0,514
Age 28-29	0,0255	0,0121	2,101	0,036
Age 30+	0,0412	0,0139	2,957	0,003
At 14, educational attainment of father				
No qualification	0,0023	0,0274	0,083	0,934
Medium qualification	0,0088	0,0086	1,016	0,309
Professional qualification	0,0051	0,0134	0,378	0,705
Diploma (scuola med/inf)	0,0358	0,0094	3,797	0,000
University diploma	0,0887	0,0277	3,204	0,001
University degree or higher	0,0426	0,0110	3,865	0,000
At 14, employment status of father				
Job-seeker	-0,0160	0,0441	-0,364	0,716
Inactive	-0,0372	0,0528	-0,704	0,481
Retired	0,0084	0,0200	0,417	0,677
Other non-employed	-0,0354	0,0223	-1,584	0,113
Father's occupation				
Imprenditore	0,0314	0,0123	2,555	0,011
Consulente/collaboratore	0,0239	0,0276	0,864	0,388
Own-account worker	0,0225	0,0085	2,651	0,008
Dirigente	0,0175	0,0104	1,687	0,092
Quadro/funzionario	0,0065	0,0109	0,596	0,551
Teacher (scuola media)	-0,0195	0,0171	-1,146	0,252
Teacher (scuola elem/mat)	0,0351	0,0292	1,202	0,229
Grad/militare di carriera	-0,0207	0,0159	-1,300	0,194
Unskilled worker	0,0188	0,0142	1,325	0,185
Home-worker	0,1911	0,1171	1,632	0,103
Other	0,0632	0,0256	2,468	0,014

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	Mother's occupation			
Professional worker	-0,0344	0,0276	-1,246	0,213
Consulente/collaboratore	0,0754	0,0370	2,038	0,042
University academic	0,1075	0,0645	1,667	0,096
Skilled worker/superviser	0,0473	0,0203	2,330	0,020
	Military Service			
Completed pre-univ	0,0402	0,0195	2,058	0,040
Completed at univ	0,0426	0,0124	3,439	0,001
Underway	-0,0386	0,0635	-0,607	0,544
Not yet started	-0,0034	0,0704	-0,049	0,961
Exonerated	0,0392	0,0123	3,176	0,001
Student employed	0,0256	0,0065	3,910	0,000

Table 3 cont.

	Broad Uniiversity Subject Area			
Science	0,0431	0,0175	2,460	0,014
Chem/Pharm	0,1203	0,0203	5,935	0,000
Geo/Biology	-0,0246	0,0181	-1,362	0,173
Medicine	0,2027	0,0283	7,158	0,000
Engineering	0,1421	0,0205	6,921	0,000
Architecture	-0,0454	0,0257	-1,765	0,078
Agriculture	0,0057	0,0247	0,231	0,817
Economics/Stats	0,0561	0,0136	4,123	0,000
Law	-0,0297	0,0161	-1,846	0,065
Literature	-0,0561	0,0158	-3,547	0,000
Languages	-0,0277	0,0165	-1,679	0,093
Teaching	-0,0378	0,0209	-1,813	0,070
Psychology	0,0405	0,0308	1,316	0,188
Course change	0,0114	0,0096	1,179	0,238

	University (grouped by region)			
Piemonte/Liguria	0,0238	0,0264	0,900	0,368
Lombardia	0,0476	0,0193	2,461	0,014
Trent/Ven/Giulia	0,0177	0,0213	0,834	0,404
Tosc/Umb/Marche	0,0009	0,0219	0,040	0,968
Lazio	0,1005	0,0289	3,482	0,001
Abr/Mol/Campania	0,0151	0,0273	0,552	0,581
Pug/Bas/Calabria	-0,0225	0,0265	-0,848	0,396
Sicilia/Sardegna	-0,0278	0,0333	-0,836	0,403
	Prior qualifications			
Degree score (out of 110)	0,0001	0,0118	0,007	0,994
Degree score sqd	0,0000	0,0001	0,122	0,903
Con Lode	0,0182	0,0088	2,078	0,038
Maturita score	0,0001	0,0056	0,010	0,992
Maturita score sqd	0,0000	0,0001	0,166	0,868
	Maturita type			
Scientifica	0,0063	0,0086	0,731	0,464
Tech/industrial	0,0300	0,0137	2,192	0,028
Tech/Geometry	-0,0016	0,0180	-0,090	0,928
Tech/Commercial	0,0047	0,0114	0,415	0,678
Other Technical	0,0040	0,0196	0,204	0,839
Magistrale	0,0130	0,0143	0,914	0,361
Linguistic	0,0023	0,0171	0,135	0,892
Professional	0,0234	0,0195	1,202	0,230
Artistic	-0,0130	0,0374	-0,348	0,728
Other	0,0094	0,0244	0,385	0,700

Table 3 (cont.)	Coeff	s.e.	t-stat	p-value
	Residence type after geographical transfer			
To owned accomm	0,0158	0,0190	0,830	0,407
To rented accomm	0,0033	0,0076	0,439	0,660
To hostel	-0,0227	0,0215	-1,059	0,290
To student hostel	-0,0060	0,0185	-0,323	0,746
To friends/relatives	0,0133	0,0266	0,498	0,618
To other	-0,0316	0,0376	-0,841	0,400
	Length of study			
Course length	-0,0417	0,0115	-3,641	0,000
4 years	0,0095	0,0140	0,677	0,499
6 years	0,0003	0,0142	0,019	0,985
7 years	0,0013	0,0150	0,088	0,930
8 years	-0,0295	0,0168	-1,753	0,080
9 years	-0,0262	0,0185	-1,416	0,157
10 years	-0,0482	0,0192	-2,514	0,012
11+ years	-0,0272	0,0191	-1,424	0,154
	Intensity of studies			
Median attendance	-0,0250	0,0198	-1,263	0,207
High attendance	-0,0313	0,0182	-1,721	0,085
Private tuition	-0,0052	0,0114	-0,458	0,647
	Post-degree training			
Professional State Exam	-0,0052	0,0093	-0,561	0,575
Further Specialisation	-0,0334	0,0090	-3,707	0,000
Further degree/diploma	-0,0087	0,0188	-0,464	0,643
University study grant	-0,0179	0,0113	-1,580	0,114
tirocinio, praticantato, stage	-0,0271	0,0074	-3,667	0,000
volontariato	-0,0292	0,0110	-2,642	0,008
other	-0,0137	0,0081	-1,693	0,091

	Type of contract			
Autonomus worker	-0,1451	0,0114	-12,676	0,000
Contract: finite	-0,0947	0,0083	-11,356	0,000
Contract: season/casual	0,2888	0,1350	2,139	0,032
Non-contract: indefinite	-0,1753	0,0255	-6,873	0,000
Non-contract: finite	-0,2671	0,0263	-10,163	0,000
Non-contract: season/casual	0,3705	0,1338	2,769	0,006
Part-time	-0,2920	0,0089	-32,962	0,000
Exceeds 40 hrs/wk	0,0780	0,0076	10,201	0,000
	Year employment began			
1996	0,0115	0,0102	1,125	0,260
1997	0,0033	0,0104	0,321	0,748
1998	0,0073	0,0108	0,675	0,500

Table 3 (cont.)	Coeff	s.e.	t-stat	p-value
	Degree requirement			
Any degree	0,0825	0,0214	3,863	0,000
Degree in general area	0,0482	0,0093	5,206	0,000
Specific degree	0,0041	0,0096	0,426	0,670
	On the job training			
Less than one month	0,0272	0,0102	2,656	0,008
One month	0,0327	0,0128	2,545	0,011
Two months	0,0472	0,0128	3,690	0,000
Three months	0,0449	0,0161	2,789	0,005
Four months	0,0710	0,0166	4,288	0,000
Five months or more	0,0537	0,0085	6,349	0,000
Overqualified for job	-0,0492	0,0078	-6,319	0,000
Underqualified for job	-0,0118	0,0132	-0,893	0,372

	Size of Establishment			
Sole worker	-0,0293	0,0137	-2,145	0,032
6-14 workers	0,0666	0,0112	5,933	0,000
15-49 workers	0,0871	0,0116	7,536	0,000
50-99 workers	0,1119	0,0138	8,113	0,000
100+ workers	0,1597	0,0107	14,926	0,000
	Region of actual residence			
Piemonte/Liguria	-0,0235	0,0257	-0,916	0,360
Lombardia	0,0132	0,0198	0,667	0,505
Trent/Ven/Giulia	-0,0017	0,0212	-0,082	0,935
Tosc/Umb/Marche	-0,0265	0,0228	-1,164	0,244
Lazio	-0,0916	0,0295	-3,104	0,002
Abr/Mol/Campania	-0,0494	0,0274	-1,802	0,072
Pug/Bas/Calabria	-0,0358	0,0246	-1,456	0,145
Sicilia/Sardegna	-0,0271	0,0338	-0,802	0,422
Private Sector	-0,0276	0,0100	-2,760	0,006
Industry Controls	Included			
Occupation Controls	Included			

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