EDUCATION AND SKILLS MISMATCH IN THE ITALIAN GRADUATE LABOUR MARKET

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Abstract:

This paper focuses on education and skills mismatch amongst Italian graduates. Indicators for over and under-utilisation of education and under-utilisation of skills are included in a grouped data lognormal wage equation, allowing us to test a number of theories which could explain the effect of over-schooling on wages. We find little evidence to support assignment theory and also identify a relatively weak wage effect arising from educational mismatch associated with the formal requirements of a job, when compared to that associated with an employee's perception of the job requirements. Our interpretation is that employers may be mis-specifying jobs as 'graduate' jobs in order to take advantage of an excess supply of graduates.

Key words: over-education, skill under-utilisation, wages, on-the-job search

JEL Classification: I21 and J31

1. Introduction

The impact of education-job mismatches on wages has been well documented in the economic literature (Cohn and Khan, 1995; Groot, 1996; Dolton and Vignoles, 2000; Cohn and Chu Ng, 2000; Chu Ng, 2001). The emerging consensus is that job characteristics are a major determinant of earnings. Thus, a large number of studies find that individuals who occupy jobs which require a level of education lower than the level they have achieved (they are over-educated[1]) earn less than individuals with the same educational attainment who work in jobs for which their level of qualification is appropriate. In contrast, the over-educated are likely to earn more than individuals in similar occupations who have a lower level of educational attainment which is more appropriate for the job.

The importance of job characteristics is further underlined if one considers individuals whose level of education is lower than that required to carry out their job (they are under-educated). Findings from the research suggest that the under-educated have higher wages than those with the same level of educational attainment who are working in jobs for which their education is considered appropriate, but less than individuals working in an equivalent job with the higher level of education which is actually required.

In this paper we focus our attention on graduate over-education in the Italian labour market. Perhaps as a result of limited data availability very little research has focused on the extent of Italian over-education. Nevertheless, statistics (ISTAT, 1997 and 2000a) suggest that the incidence of over-education among Italian graduates has increased significantly over the second half of the 1990s[2]. Given a variety of evidence (see, for instance, Checchi, 2000) that an Italian university education does not seem to enhance employment prospects as much as in other countries of the OECD, one may expect many graduates to be pushed into accepting non-graduate jobs. For instance, in 1999 the unemployment rate among Italian individuals aged between 25 and 64 who possessed a tertiary school degree was 4.2 per cent for men and 7.6 for women,

[1] The terms "over-educated' and 'over-qualified' are used here interchangeably as well as "under-educated" and "under-qualified".

[2] The proportion of graduates working in jobs for which a university degree was not a formal requirement increased from 26.3 per cent to 31.5 per cent between 1995 and 1998.

whereas for the OECD as a whole, the average was only 3.1 per cent and 4.1 per cent respectively (OECD, 2001).

Moreover, there is evidence that labour market prospects are particularly unfavourable for new graduates attempting to secure their first job. For instance, following graduation individuals spend an average of 19 months before finding their first job - the corresponding figure for a recent secondary school graduate is 20 months (Sorcioni, 1999). This problem seems to persist for many years after graduation and only after reaching the age of 35 does a tertiary school degree holder face a lower risk of unemployment than those who hold only secondary or primary school qualifications (ISTAT, 2000b).

In this paper we attempt to add to the expanding literature on over-education with a study of the effects of over-schooling on wages and on-the-job search in Italy. We present the results of several specifications for our regression equations in an attempt to test the validity of various theories, which have been put forward to explain the wage effects of over-education - including an analysis of the extent to which the impact of over-qualification reflects an under-utilisation of skills. We adopt a methodological approach similar to that used in related work by Allen and Van Der Velden, (2001) and Green and McIntosh (2002) on Dutch and English graduates respectively.

The main difference in approach concerns our indicators of over-education. Whilst previous work has tended to focus on a measure of over-qualification from either the employee or employer perspective, we are able to use both in our regression analysis. Thus we are able to identify whether a university degree was a 'formal' requirement for a given job (an indicator which we interpret as the employer's 'official' view of the job requirements) and also whether the employee feels that their level of education is appropriate for actually 'carrying out' the job. In this way we are able to account for the possibility that employers are attempting to benefit from the increased supply of graduates by re-categorising jobs as requiring a degree, when both the education required and the wage scale associated with the job are clearly not graduate-level.

In addition to the various specifications for our wage equation we also attempt to identify the most important factors influencing a worker's decision to search for a job better suited to their own capabilities. The rationale for this is that being over-educated can be interpreted as a 'transient state', occupied by workers who are attempting to gain additional information on labour market opportunities and adjust their present position through additional job-search (Hartog, 2000). In Italy this situation may be exacerbated by the high costs of job search. As suggested by Faini et al. (1997), the inefficiency, which results from the virtual monopoly of public employment agencies, may add to the problems of mismatch.

The structure of the remainder of the paper is as follow. Several explanations for the effects of over-education on wages are outlined in Section 2. Section 3 describes the data and variables used in the regression analysis. Some descriptive statistics on the relation between over and under-qualification and over and under-utilisation of skills are provided in Section 4. Sections 5 and 6 present the empirical results on the effects of educational and skill mismatches on wages and on-the-job search respectively. Section 7 concludes.

2. Theoretical Perspectives

Four main theories have been advanced to explain the observed wage effects of over-schooling. These are human capital theory, assignment theory, heterogeneous skill theory and institutional theory.

Human capital theory

Human capital theory suggests that individuals are paid the value of their marginal product[3], which in turn is determined by their human capital, rather than the characteristics of the job they occupy (Becker, 1975). According to human capital theory, individuals undertake investment in their human capital if the net present value of future incremental earnings accruing from the investment, outweigh the direct and opportunity costs. Thus the Mincerian earnings specification is as follows,

$$\ln w = a_1 S^a + X a_2 + e \qquad (1)$$

[3] Though they may be paid less than marginal product (MP) early in their career and higher than MP later on in life.

where S^a is the actual years of education attained, X is a vector of control variables and e is a random error term.

It is assumed that firms are able to fully utilise the skills and the knowledge of their employees, and to be able to adapt their production technology in response to changes in the relative supply of skilled labour. Several economists, however, (Duncan and Hoffman, 1981; Hartog and Oosterbeek, 1988; Rumberger, 1987) have called these assumptions into question. First, institutional rigidities, such as restrictive working practices, may imply that firms neither fully utilise every individual's education, nor pay every individual the value of their potential marginal product (Green et al., 1999). Second, the substantial increase in the supply of graduates over the last two decades may have seriously challenged the firms' ability to adapt production techniques to utilise more skilled labour. If firms cannot adapt their production techniques in response to changes in skilled labour availability, and/or cannot fully use an individual's education, then an individual's productivity and hence his/her wage may crucially depend on the characteristics of their job.

In the light of these considerations several researchers have split the schooling variable (S^a) into years of required education (S^r) and years of surplus (S^o), or deficit (S^u), of schooling - years of over-education and under-education respectively. By definition:

$$S^a = S^r + S^o - S^u \qquad (2)$$

Thus the earnings specification is given by

$$\ln w = ß_0 + ß_1 S^r + ß_2 S^o + ß_3 S^u + X ß_4 + e \qquad (3)$$

Estimation of the wage equation (3) allows researchers to study whether individuals' earnings depend on both their level of human capital investment and the educational requirements of the job, or if productivity is solely dependent upon their human capital ($ß_1 = ß_2 = ß_3 = a_1$)

Assignment theory and heterogeneous skill theory

In the literature, the view that workers' earnings are determined by both the extent of human capital investment and job characteristics (required levels of education and

skills) is shared by two theories. These are the assignment theory (Sattinger, 1993) and the heterogeneous skill theory (Green and McIntosh, 2002). The difference between the two lies in the interpretation of the relationship between under- and over-education (educational mismatch) and under- and over-utilisation of skills (skill mismatch).

According to assignment theory, these concepts are closely related. Thus, workers report that their level of education is inappropriate for the job they occupy because of the poor match between the knowledge and the skills acquired during their years of study and those needed to actually carry out their job. Following from this one would expect workers whose level of education is higher than their job typically requires to be unable to fully utilise their skills. Hence, they are likely to be less productive than their peers with the same level of education who occupy jobs for which their own level of educational attainment is appropriate.

Alternatively, the heterogeneous skills theory suggests that the link between educational and skill mismatch is much weaker. The basic assumption is that, even amongst individuals with the same level of schooling, there is significant variability in terms of skill endowments and ability. Thus it is quite possible to find workers who appear to be over-educated but, because their level of skills and abilities are at the bottom of the range of people with similar qualifications, in terms of abilities and skills they may match more closely those with the appropriate (lower) level of education for the job they occupy. Accordingly, the reason why over-qualified workers are found to earn less than their peers with the same level of education who work in jobs for which their qualifications are appropriate, is because the former are either less able or have less marketable skills.

To examine whether the effects of over and under-qualification reflect the limits placed on opportunities for skill utilisation, as opposed to heterogeneity in the skill endowments of individuals within the same level of educational attainment, researchers (see, for instance, Allen and Van Der Velden, 2001; Green and McIntosh, 2002) have included among the explanatory variables of the wage equation, measures of both education and skills mismatch. Thus, if the coefficient on over-qualification is considerably reduced when one controls for the effect of under-utilisation of skills,

then the assignment theory would seem to be a more accurate explanation of any observed wage effects of educational mismatch. In contrast, if skill mismatches account for very little of the wage effects of educational mismatch, then heterogeneity of skills within bands of educational achievement would seem to present a more accurate explanation – though it must be noted that this is a necessary rather than a sufficient condition for the acceptance of this theory.

The assignment and heterogeneous skill theories are often tested using indicators of educational mismatch, which are based on employees' perceptions of the level of education required to **carry out** their jobs. The rationale being that, only these self-reported 'subjective' measures of educational mismatch can be reliably compared to the jobholder's judgement concerning the degree of utilisation of his/her knowledge and skills.

Institutional theory

Institutional theorists suggest that only job characteristics (required level of education) determine earnings (Thurow, 1975)[4]. The rationale for this is that, as a result of the problems employers encounter when attempting to quantify individual productivity, job characteristics are often used by firms to make inferences over workers' productivity and hence their wages. Thus, the formally required level of education for the job is frequently incorporated in wage scales, as determined in collective and individual bargaining agreements. In order to test this theory it is preferable to use measures of educational mismatch which reflect the level of education **formally** required to **obtain** the job rather than the one considered by the employee to be the most appropriate to **carry out** the job tasks. Whilst we would expect these two measures to be correlated, information asymmetries – possibly arising from the employer's limited understanding of the skills associated with various levels of educational attainment and the applicant's lack of information on the true requirements of the job – are likely to reduce the correspondence between formal requirements and employee perceptions.

[4] In equation (3) $\beta_2=\beta_3=0$.

3. Data and Methodology

The data are taken from a survey carried out by ISTAT (National Statistical Italian Centre) in 1998 on individuals who graduated from all Italian universities in 1995. The survey asks questions on previous educational attainment, degree results, employment status, parents' socio-economic characteristics, as well as a variety of personal attributes. Using a sample frame of all individuals who graduated from Italian universities in 1995 (105,097), the target sample was fixed at 25,716 students. Of these, 64.7 per cent (17,326 individuals) responded to the questionnaire.

Although the response rate is as one would expect for a postal survey, the data collected are unlikely to be fully representative of the Italian graduate population. As Dolton and Vignoles (2000) suggest, graduates who have moved house without leaving forwarding addresses will not receive the questionnaire and bias will arise if graduate mobility is none random. In addition, it is common for lower response to be associated with certain groups such as the unemployed (Shackleton and Urwin, 1999).

Also, it should be mentioned that our data on after-tax wages are subject to two particular limitations. First, wages are recorded on a monthly, rather than an hourly basis and this forces us to restrict the sample under analysis to those graduates who are working full-time - in an attempt to select a relatively homogeneous group of workers in terms of number of working hours. Furthermore, Robinson (2000) shows that, since the returns to part-time work greatly differ from the returns to full-time work, it is not meaningful to pool full-time and part-time data together. Second, our data on wages are grouped into four broad categories (in thousands of Liras and with the proportion of graduates in brackets):

0 < 1,500 (19.8%)	1,501-2,000 (40.9%)
2,000-3,000 (33.8%)	> 3,000 (5.6%)

Whilst the small number of wage categories may reflect the relatively narrow earnings distribution in Italy (see, for instance, Gottshalk and Smeeding, 1997), we would ideally have a greater number of categories. To estimate the wage equation we use a grouped regression model and assume a parametric distribution (lognormal) for the error term. The assumption that the distribution of the error tem is lognormal has been

widely adopted in estimating equations using censored wage data (see, for instance, Addison and Portugal, 2002).

Both our measures of educational mismatch are worker self-reported. However, as stated previously, we interpret the first of these measures as representing the views of the employer. Thus, the first measure we use records the level of schooling **formally** required for a particular job. Specifically, graduates were asked to respond to the question: "Was a university degree a formal requirement to **obtain** your current job?". The second measure asks graduates to compare their level of education with the one they consider to be appropriate to **carry out** their job tasks. In this case, graduates were asked to respond to the question: "With respect to your current job, do you feel that having a university degree is excessive, adequate or insufficient?".

We then construct skill mismatch variables from the responses to a question that asks graduates to indicate, "the extent to which they have used the knowledge and the skills acquired at university in their current job". Answers to this question are on a four-point scale, as follows: "a lot", "quite a lot", "a little" and "none". Unfortunately, in contrast to the analyses carried out by Allen and Van Der Velden, (2001) and Green and McIntosh (2002), it has not been possible to set up an indicator for skill deficit, as our survey does not include a question on this issue.

Using the response to these three questions we create four dummy variables. The first one (EDMIS) takes a value of 1 if a university degree was not a formal requirement for the graduate's current job, and 0 otherwise. Similarly, the second dummy variable (OVERED) has a value of 1 if the worker considers their level of education to be excessive, relative to the job tasks they have to perform, and 0 otherwise. The third dummy variable (UNDERED) takes a value of 1 if a worker feels that their level of education is insufficient, relative to the job tasks. Finally, with respect to skill mismatch, we construct a dummy variable (SKIMIS) which takes the value 1 if graduates respond that they have used either "none" or "a little" of the knowledge and skills acquired at university in their current jobs, and 0 otherwise.

In addition to the measures of educational and skills mismatch, our wage specification comprises a large number of control variables including age, sex, nationality, existence of dependents, whether individuals are married or cohabiting, social class,

subject of study, degree classification, firm size, industry, postgraduate qualifications, tenure, experience, geographical area, amount of time spent on-the-job training and occupation. A description of the variables and summary statistics can be found in Tables 1 and 2 respectively.

Insert Tables 1 and 2 Near Here

4. Education and Skills Mismatch

In our sample the proportion of graduates who claimed that their employer required them to have a university degree to obtain their job is 68.5 per cent whilst the proportion of those who stated that a university degree was needed to actually carry out the job tasks is slightly higher at 69.8 per cent.

In addition, the proportion of Italian graduates who stated using "none" or "a little" of the skills and knowledge acquired at university in their current job is very high (41.8 per cent). This may be a consequence of the Italian university system's focus on imparting theoretical knowledge to students, as opposed to on-the-job training or work experience (Groot, 1993). Accordingly, this outcome may be interpreted as the result of a mismatch between the skills imparted by tertiary education and the skills required by firms.

Table 3 shows the relation between the educational mismatch measure based on the jobholder's view of the education needed to carry out the job and the indicator for skill under-utilisation. As can be seen, 72.77 per cent of graduates who considered their level of education to be adequate for the job, report using "quite a lot" or "a lot" of the knowledge and skills learnt at university. Similarly, 80.32 per cent of graduates working in jobs for which they felt having a university degree was excessive, claimed using "none" or "a little" of the skills and the knowledge acquired at university. Thus, whilst there is a relatively strong positive correlation between educational and skill mismatches, the former is neither a necessary nor a sufficient condition for the latter.

Insert Table 3 Near Here

This result is consistent with the analyses carried out by Allen and Van Der Velden (2001) on Dutch graduates and by Green and McIntosh (2002) on UK graduates. Thus, approximately 19.64 per cent of graduates occupying jobs for which they

considered their level of education to be excessive, claimed using "quite a lot" or "a lot" of the knowledge and the skills acquired at university in their current job. Further analysis of this sub-group of workers reveals that approximately 60 per cent of them had an intermediate occupation (e.g. technicians, nurses, office managers). Whilst it would seem that having a degree is considered excessive for this type of occupation, there would seem to be scope for the use of skills and knowledge acquired.

More importantly, we find that 27.22 per cent of those graduates who considered their level of education to be appropriate for the job, report severe skill under-utilisation. A possible explanation is that a university education imparts skills that are only indirectly related to their future job tasks (i.e. the more 'general' and 'transferable' skills). Thus, the knowledge and skills acquired at university will enable graduates to learn easily and quickly those techniques and processes that are specifically required to perform their job tasks.

5. The Impact of Mismatch on Wages

Table 4 presents estimates of the effects of education and skills mismatch on earnings. The first column gives the results of a specification (specification 1) that includes indicators for human capital (i.e. postgraduate qualifications, time spent-on-the-job training, labour market experience) together with all the control variables mentioned in Section 3. The empirical results are consistent with previous research, with the exception of the coefficient on postgraduate qualifications, which is positive as expected, but not statistically significant.

Insert Table 4 Near Here

Thus, undertaking on-the-job training, having labour market experience before the start of the current job and having tenure in the current job result in a higher wage. The pattern of industry, geographical location, social class, occupation and subject of study differentials are also as one would expect. As regards degree classification, those individuals who have achieved the highest level of educational attainment (110 summa cum laude) at university are found to earn approximately 2 per cent more than their peers whose grade was between 105 and 110. In line with the results obtained by Pistaferri (1999), the size of a firm is found to exert a significant influence on earnings in Italy.

The results of specification 2, presented in the second column of Table 4, include the educational mismatch variables based on an employees' judgment of the level of education required to carry out the job. As expected, the coefficient on over-education is found to be negative and statistically significant, whereas that on under-education is neither in line with expectations nor statistically significant. The results indicate that over-qualified graduate workers earn, on average, 5.1 per cent less than those with the same qualification level who occupy jobs for which they are adequately qualified. This seems quite low, but one should bear in mind that Dolton and Silles (2001) find that the wage penalty associated with over-educated graduate workers is lower in their first employment destination than in the later stages of their career. Furthermore, one may note that the inclusion of these educational mismatch variables has improved the fit of the model.

In specification 3 we utilise an indicator of skill mismatch instead of the educational mismatch variables in an attempt to explain wage differences. The results are presented in the third column of Table 4. As expected, skill under-utilisation is found to have a negative impact on earnings. According to our findings, the wage penalty for those graduates who reported using "none" or "a little" of the skills and knowledge learnt at university in their current job is about 1.5 per cent. In addition, it is interesting to note that specification 3 accounts for less of the variation in wages than specification 2.

In specification 4, whose results are depicted in the fourth column of Table 4, the previously employed indicators for education and skills mismatch are combined. While the effect of under-utilisation of skills on wages disappears when controlling for educational mismatches, the impact of over-qualification on earnings is virtually unaffected by the inclusion of the skill mismatch measure. More specifically, the value of the coefficient on over-education is largely unchanged relative to the one obtained in specification 2, whereas the estimated value of the indicator for skill under-utilisation is statistically insignificant and its sign is not in line with expectations.

These empirical results question the strength of assignment theory as an explanation of the wage effects arising from over-education. Thus, an examination of the measures of fit associated with each specification shows that, in specification 4, the

value of the likelihood ratio index is only slightly higher than that in specification 2, which in turn, is considerably higher than that associated with specification 3. However, it should be noted that, whilst the findings are more consistent with the heterogeneous skills theory, they do not provide incontrovertible evidence – the rejection of assignment theory is a necessary but not a sufficient condition for the validity of heterogeneous skills theory.

In specification 5 we add (to specification 1) an indicator for educational mismatch constructed using the level of education formally required to obtain the job. The results are reported in the fifth column of Table 4. The findings indicate that graduates working in jobs for which a university degree was not formally required, receive lower wages than other graduates who occupy jobs for which a degree was a formal requirement. More specifically the odds ratio associated with this measure is 0.964, implying a wage penalty of 3.6% for graduates working in a job for which a university degree was not formally required.

Thus, it would seem that the relative earnings disadvantage associated with over-education is higher in specification 2 than in specification 5. At first this may seem to be somewhat counter-intuitive, as it suggests that the employee's view of the job requirements are more important in determining wages than the formal requirements of the employer. However, as noted previously, it is possible that a number of employers have taken advantage of the over-supply of graduates by re-designating some non-graduate jobs (especially those at the margin between non-graduate and graduate jobs) as formally requiring a university degree. Assuming that these employers have failed to adjust the corresponding wage scale associated with newly designated 'graduate' jobs, we would expect a lowering of the earnings differential between those jobs which are formally designated as graduate and non-graduate.

The low value of the coefficient on our indicator of educational mismatch - based on the formally required level of education - may then be interpreted as reflecting this situation, as one would expect the views of workers who have been in their job for some time to better reflect the actual level of education needed to carry out the job. Thus, the coefficient on our indicator of the jobholder's perception of educational requirements could be acting as a signal, identifying those jobs which have been mis-specified as 'graduate' (due to employer opportunism) but do not actually have pay

scales in place which reward graduate skills – the pay scale is one which we would associate with a non-graduate job.

6. Mismatch and On-The-Job Search

In this section of the paper we examine the extent to which education and skills mismatches constitute a motivation for individuals to look for another job. In order to carry out this analysis we run a binomial logistic regression with the dichotomous dependent variable recording whether graduate workers are seeking alternative employment. In addition to the control variables included in the previous model, we also introduce wage dummies as possible explanatory factors.

Insert Table 5 Near Here

The empirical findings of the basic specification (specification 1) are depicted in the first column of Table 5. These indicate that occupation, social class and industry dummies affect the probability that graduates will search for another job. As expected, earnings are found to be a strong predictor of the probability of looking for another job. More specifically, a low wage is a strong incentive for graduates to seek alternative employment.

In specification 2, whose results are shown in the second column of Table 5, we add to specification 1 the two indicators for educational mismatch reflecting the jobholder's view of the appropriate level of education needed to carry out the job. The coefficient on over-education is statistically significant and its sign is as expected. Thus, graduate workers who consider their level of education to be excessive, relative to the job tasks they have to perform, are 2.89 times more likely to look for another job relative to their peers who feel their own level of education is appropriate for their job. Furthermore, the inclusion of the educational mismatch measure has significantly improved the fit of the regression.

For specification 3, the results of which are presented in the third column of Table 5, we remove the educational mismatch variables and introduce a measure of skill under-utilisation. The estimated coefficient on the measure of skill under-utilisation is statistically significant and has the expected sign. Nevertheless, from the estimates of specifications 2 and 3 it emerges that over-qualification is a stronger predictor of

seeking alternative employment than skill under-utilisation. In line with this, one may also note that the measure of the fit is higher in specification 2 than in specification 3.

In specification 4, whose results are shown in the fourth column of Table 5, we include both the aforementioned education and skills mismatch measures. Although the associated marginal effects are lower than those for specifications 2 and 3, the empirical findings are consistent with the view that over-qualification exerts a stronger influence on the probability of looking for another job relative to skill under-utilisation. This result is not in line with that obtained by Allen and Van Der Velden (2001) who find that, in the Netherlands, skills mismatch is a stronger determinant of the probability of looking for alternative employment relative to education mismatch. Thus, it would seem that over-qualification is a greater cause of dissatisfaction amongst Italian graduates than skill under-utilisation.

A possible reason for this lies in the graduates' perception of their relative position within the labour market. Since skill under-utilisation is more widespread amongst Italian graduates, when compared to the extent of over-education, those who report that they are over-skilled may not perceive their position within the labour market to be particularly unfavourable. Thus, they are unlikely to consider the possibility of changing jobs, as there is a high probability that they will once again end up in a job which under-utilises the knowledge and skills acquired at university. In contrast, since being over-educated is less common than being over-skilled, graduates may be less willing to tolerate the former, considering the probability of a better match to be sufficiently high to justify searching for an alternative job.

In specification 5 (fifth column of Table 5) we add an educational mismatch measure based on the level of education formally required to obtain the graduate's present job. Again the coefficient on this indicator is statistically significant and its sign is as expected. Unsurprisingly, the odds ratio associated with this measure is found to be significantly lower than the one related to the indicator for educational mismatch which reflects the jobholder's view about the level of education appropriate for the job. Clearly, the latter, being based on the employee's perception, is more likely to have behavioural consequences than the former, which mirrors the employer's view.

7. Conclusion

This paper has analysed the effect of over-schooling on earnings and on on-the-job search among Italian graduates. In line with previous work, we find that graduates whose level of education exceeds the adequate or formally required level of education for their job, receive lower wages than their peers with similar level of schooling in jobs for which they are suitably qualified.

We reject the hypothesis that productivity is solely dependent upon the characteristics of the individual (specifically the level of human capital) and also the contention that productivity is entirely job specific (as assumed by institutional theorists). Our empirical results are more 'consistent' with the heterogeneous skills theory as an explanation of the observed effects of over-education on earnings, though we do not believe that the findings are sufficient to justify un-reserved acceptance of this theory. Thus, we identify a wage penalty associated with being over-educated which is not reduced once we control for possible over-skilling. This suggests that the underlying reason why over-qualified graduates earn less than correctly allocated graduate workers is not skill under-utilisation – a finding that questions the explanatory power of the assignment theory.

In addition, we suggest that our results support the view that employee perceptions of the educational requirements of a particular job are more reliable indicators of the true nature of the job (and therefore the associated pecuniary returns), when compared to the formal educational requirements as set out by the employer. This result would seem to be consistent with a phenomenon of increasing graduate numbers, which leads to a relative over-supply of graduates (relative to the supply of non-graduates). In this situation, employers may be tempted to take advantage of such an over-supply and artificially raise the formal educational requirement for a range of jobs, which have traditionally been held by non-graduates. However, these newly specified jobs are likely to have pay scales that continue to reflect the true 'non-graduate' nature of the job tasks. This has the effect of reducing the **average** earnings differential between jobs that are more formally categorised as graduate and non-graduate. In this instance, those workers who register that their level of education is excessive for their present job are signalling that their present employment is incorrectly designated as 'graduate' and that the accompanying wage scale is also non-graduate.

Finally, with reference to our regression equation which models job-search behaviour, we would conclude that over-education is a stronger predictor of the probability that Italian graduates will seek alternative employment, when compared to skill under-utilisation. This result, which runs counter to those obtained from previous research analysing Dutch graduates, could be ascribed to Italian graduate perceptions over the relative status associated with being either over-skilled or over-educated. Since in Italy the former is significantly more frequent than the latter, many graduates may be more willing to accept skill under-utilisation as opposed to over-education.

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Table 1: Definition of Variables

Variable	Definition
POSTQUAL	Dummy variable: 1 if the graduate has a higher degree or other postgraduate qualification and 0 otherwise.
EXP	Dummy variable: 1 if the graduate has experience before his/her current job and 0 otherwise.
TENURE	Dummy variable: 1 if the graduate has tenure in his/her current job and 0 otherwise.
MALE	Dummy variable: 1 if the graduate's sex is male and 0 otherwise.
CHILD	Dummy variable: 1 if the graduate has at least one child and 0 otherwise.
MARCOHA	Dummy variable: 1 if the graduate is married or cohabiting and 0 otherwise.
OVERED	Dummy variable: 1 if the graduate feels his/her level of education to be excessive relative to the job he/she is doing and 0 otherwise.
UNDERED	Dummy variable: 1 if the graduate feels his/her level of education to be insufficient relative to the job he/she is doing and 0 otherwise.
EDMIS	Dummy variable: 1 if university degree was not formally required to obtain the job the graduate is doing and 0 otherwise.
SKIMIS	Dummy variable: 1 if the graduate uses "none" or "a little" of the skills and knowledge acquired at university in his/her current job and 0 otherwise.
ECON	Dummy variable: 1 if the graduate's subject of study is Economics or Agricultural studies and 0 otherwise.
LAW	Dummy variable: 1 if the graduate's subject of study is Law and 0 otherwise.
POLSC	Dummy variable: 1 if the graduate's subject of study is Political Science and 0 otherwise.
MEDIC	Dummy variable: 1 if the graduate's subject of study is Medicine and 0 otherwise.
SCIENCE	Dummy variable: 1 if the graduate's subject of study is physics, maths, chemistry, biology or pharmacy and 0 otherwise.
ENGTECH	Dummy variable: 1 if the graduate's subject of study is architecture or engineering and 0 otherwise.
ARTS	Dummy variable: 1 if the graduate's subject of study is literature, languages, psychology or education and 0 otherwise.
CONSTRU	Dummy variable: 1 if the graduate is employed in the construction industry and 0 otherwise.
WHOLES	Dummy variable: 1 if the graduate is employed in the wholesale, retail, restaurant or associated trades and 0 otherwise.
FINANCE	Dummy variable: 1 if the graduate is employed in the finance, insurance, real estate and business services sector and 0 otherwise.
TRANSP	Dummy variable: 1 if the graduate is employed in the transportation, storage and communication industries and 0 otherwise.
MANUF	Dummy variable: 1 if the graduate is employed in manufacturing and 0 otherwise.
AGRIC	Dummy variable: 1 if the graduate is employed in agriculture, hunting, forestry and fishing industries and 0 otherwise.
PUBAD	Dummy variable: 1 if the graduate is employed in public administration and defence, education, health and social work, other community, social and personal, or extra-territorial organisations and bodies.
NOEAST	Dummy variable: 1 if the geographical location of the university attended by the graduate is Northeast and 0 otherwise.
CENTRE	Dummy variable: 1 if the geographical location of the university attended by the graduate is Centre and 0 otherwise.
AREAUNK	Dummy variable: 1 if the geographical location of the university attended by the graduate is unknown and 0 otherwise.
NOWEST	Dummy variable: 1 if the geographical location of the university attended by the graduate is Northwest and 0 otherwise.
SOUTH	Dummy variable: 1 if the geographical location of the university attended by the graduate is South and 0 otherwise.
SOCLA1	Dummy variable: 1 if the graduate's father is a manager, high level public servant, entrepreneur, intellectual or has a scientific and highly specialised occupation and 0 otherwise.
SOCLA2	Dummy variable: 1 if the graduate's father has an intermediate occupation (technician), a middle-management occupation, an occupation related to sales and personnel services or is a policeman or a soldier and 0 otherwise.
SOCLA3	Dummy variable: 1 if the graduate's father is a craftsman, farmer, a plant and machine operative or has a non-specialist occupation and 0 otherwise.
SOCLA4	Dummy variable: 1 if the graduate's father's occupation is unknown and 0 otherwise.

FIRMSIZE1	Dummy variable: 1 if the graduate works in a firm with between 1 and 5 employees and 0 otherwise.
FIRMSIZE2	Dummy variable: 1 if the graduate works in a firm with between 6 and 49 employees and 0 otherwise.
FIRMSIZE3	Dummy variable: 1 if the graduate works in a firm with between 50 and 99 employees and 0 otherwise.
FIRMSIZE4	Dummy variable: 1 if the graduate works in a firm with more than 100 employees and 0 otherwise.
FIRMSIZE5	Dummy variable: 1 if the number of employees working in the same firm of the graduate is unknown and 0 otherwise.
PROF1	Dummy variable: 1 if the graduate is a manager, high level public servant, entrepreneur, intellectual or has a scientific and highly specialised occupation and 0 otherwise.
PROF2	Dummy variable: 1 if the graduate has an intermediate occupation (technician), a middle-management occupation, an occupation related to sales and personnel services or is a policeman or a soldier and 0 otherwise.
PROF3	Dummy variable: 1 if the graduate is a craftsman, farmer, a plant and machine operative, or has a non-specialist occupation, or his/her occupation is unknown and 0 otherwise.
ONJTR1	Dummy variable: 1 if the graduate has spent no time on-the-job training and 0 otherwise.
ONJTR2	Dummy variable: 1 if the graduate has spent one week or less on-the-job training and 0 otherwise.
ONJTR3	Dummy variable: 1 if the graduate has spent more than one week on-the-job training and 0 otherwise.
DEGR1	Dummy variable: 1 if the graduate's university degree classification is between 70 and 89.99 and 0 otherwise.
DEGR2	Dummy variable: 1 if the graduate's university degree classification is between 90 and 99 and 0 otherwise.
DEGR3	Dummy variable: 1 if the graduate's university degree classification is between 100 and 104.99 and 0 otherwise.
DEGR4	Dummy variable: 1 if the graduate's university degree classification is between 105 and 110 and 0 otherwise.
DEGR5	Dummy variable: 1 if the graduate's university degree classification is 110 summa cum laude and 0 otherwise.
AGE1	Dummy variable: 1 if the graduate's age is between 24 and 25 and 0 otherwise.
AGE2	Dummy variable: 1 if the graduate's age is between 26 and 27 and 0 otherwise.
AGE3	Dummy variable: 1 if the graduate's age is between 28 and 29 and 0 otherwise.
AGE4	Dummy variable: 1 if the graduate's age is 30 or more 0 otherwise.
AGE5	Dummy variable: 1 if the graduate's age is unknown and 0 otherwise.
ITAL	Dummy variable: 1 if the graduate is Italian and 0 otherwise.
WAGE	Categorical variable (taking a value between 1 and 4 inclusively) indicating the after-tax wage of the graduate.

Table 2: Descriptive Statistics

Number of observations	7,484	
	Mean	Std. Deviation
POSTQUAL	0.0836	0.2769
EXP	0.4017	0.4903
TENURE	0.4643	0.4988
MALE	0.4372	0.4961
CHILD	0.0403	0.1968
MARCOHA	0.2865	0.4521
OVERED	0.2547	0.4357
UNDERED	0.0474	0.2126
EDMIS	0.3151	0.4646
SKIMIS	0.418	0.4933
ECON	0.2638	0.4407
LAW	0.0809	0.2728
POLSC	0.0515	0.2212
MEDIC	0.0443	0.2059
SCIENCE	0.1895	0.3919
ENGTECH	0.2459	0.4306
ARTS	0.124	0.3296
COSNTRU	0.1005	0.3007
WHOLES	0.0531	0.2244
FINANCE	0.3037	0.4599
TRANSP	0.0404	0.1971
MANUF	0.1896	0.392
AGRIC	0.0148	0.1209
PUBAD	0.2977	0.4573
NOEAST	0.2747	0.4464
CENTRE	0.1876	0.3904
SOUTH	0.1646	0.3709
AREAUNK	0.0646	0.246
NOWEST	0.3084	0.4619
SOCLA1	0.3298	0.4702
SOCLA2	0.3784	0.485
SOCLA3	0.2366	0.425
SOCLA4	0.0551	0.2284
FIRMSIZE1	0.198	0.3985
FIRMSIZE2	0.2354	0.4243
FIRMSIZE3	0.0751	0.2636
FIRMSIZE4	0.4019	0.4903
FIRMSIZE5	0.0895	0.2855
PROF1	0.4393	0.4963
PROF2	0.5362	0.4987
PROF3	0.0244	0.1545
ONJTR1	0.514	0.4998
ONJTR2	0.1654	0.3716
ONJTR3	0.32006	0.4667
DEGR1	0.0362	0.1868
DEGR2	0.21	0.4074
DEGR3	0.2157	0.4113
DEGR4	0.3167	0.4652
DEGR5	0.2214	0.4152
AGE1	0.3149	0.4645
AGE2	0.3105	0.4627
AGE3	0.1325	0.3391
AGE4	0.0848	0.2787
AGE5	0.1571	0.364
ITAL	0.9812	0.136
WAGE	2.251	0.8335

Table 3: The Relation between over/under –education and a measure of skill under-utilisation

Under and over education based on job holder's view	Extent to which graduates have used the knowledge and skills acquired at university in their current job		
	"Quite a lot"/" A lot"	*"None/ A little"*	*Total*
Over-educated	375	1,531	1,906
Adequately educated	3,801	1,422	5,223
Under-educated	180	175	355
Total	4,356	3,128	7,484

Table 4: Wage equation, grouped regression, log-normal: marginal effects (standard errors in parentheses)

	Specification 1	*Specification 2*	*Specification 3*	*Specification 4*	*Specification 5*
Constant	14.401 (0.259)*	14.42 (0.026)*	14.409 (0.026)*	14.42 (0.026)*	14.416 (0.026)*
MALE	0.067 (0.007)*	0.066 (0.007)*	0.067 (0.007)*	0.066 (0.007)*	0.066 (0.007)*
MARCOHA	0.02 (0.007)*	0.019 (0.007)*	0.019 (0.007)*	0.019 (0.007)*	0.021 (0.007)*
CHILD	0.029 (0.016)**	0.03 (0.016)**	0.03 (0.016)**	0.029 (0.016)**	0.031 (0.016)*
ITAL	-0.01 (0.022)	-0.011 (0.022)	-0.01 (0.022)	-0.011 (0.022)	-0.009 (0.022)
Age- Reference group is AGE1					
AGE2	-0.012 (0.008)	-0.01 (0.008)	-0.011 (0.008)	-0.01 (0.008)	-0.011 (0.008)
AGE3	-0.004 (0.01)	-0.002 (0.01)	-0.003 (0.01)	-0.002 (0.01)	-0.003 (0.01)
AGE4	-0.012 (0.013)	-0.011 (0.013)	-0.012 (0.013)	-0.011 (0.013)	-0.01 (0.013)
AGE5	-0.023 (0.01)*	-0.02 (0.01)*	-0.022 (0.01)*	-0.02 (0.01)*	-0.02 (0.01)*
POSTQUAL	0.012 (0.011)	0.012 (0.011)	0.012 (0.011)	0.012 (0.011)	0.0105 (0.011)
EXP	0.028 (0.006)*	0.027 (0.006)*	0.028 (0.006)*	0.027 (0.006)*	0.028 (0.006)*
TENURE	0.112 (0.007)*	0.112 (0.07)*	0.112 (0.007)*	0.112 (0.007)*	0.111 (0.007)*
Amount of time spent on-the-job training- Reference group is ONJTR2					
ONJTR2	0.046 (0.009)*	0.045 (0.009)*	0.046 (0.009)*	0.045 (0.009)*	0.045 (0.009)*
ONJTR3	0.057 (0.007)*	0.054 (0.007)*	0.056 (0.007)*	0.054 (0.007)*	0.054 (0.007)*
Social class- Reference group is SOCLA2					
SOCLA1	0.021 (0.007)*	0.02 (0.007)*	0.021 (0.007)*	0.02 (0.007)*	0.021 (0.007)*
SOCLA3	-0.008 (0.008)	-0.008 (0.008)	-0.008 (0.008)	-0.008 (0.008)	-0.007 (0.008)
SOCLA4	0.047 (0.014)*	0.047 (0.014)*	0.047 (0.014)*	0.047 (0.014)*	0.047 (0.014)*
Subject of study- Reference group is ECON					
SCIENCE	-0.004 (0.009)	-0.001 (0.01)	-0.002 (0.01)	-0.001 (0.01)	-0.004 (0.01)
MEDIC	0.077 (0.017)*	0.075 (0.017)*	0.077 (0.017)*	0.075 (0.017)*	0.072 (0.017)*
ENGTECH	0.009 (0.009)	0.009 (0.009)	0.01 (0.009)	0.009 (0.009)	0.004 (0.009)
POLSC	-0.036 (0.015)*	-0.032 (0.015)*	-0.033 (0.015)*	-0.032 (0.015)*	-0.029 (0.015)*
LAW	-0.116 (0.013)*	-0.114 (0.013)*	-0.115 (0.013)*	-0.114 (0.013)*	-0.115 (0.013)*
ARTS	-0.092 (0.012)*	-0.085 (0.012)*	-0.09 (0.012)*	-0.085 (0.012)*	-0.082 (0.012)*
Industry- Reference group is FINANCE					
AGRIC	-0.047 (0.026)**	-0.044 (0.026)**	-0.049 (0.026)**	-0.044 (0.026)**	-0.048 (0.026)**
MANUF	0.066 (0.01)*	0.066 (0.01)*	0.066 (0.01)*	0.066 (0.01)*	0.063 (0.01)*
COSNTRU	0.05 (0.011)*	0.05 (0.011)*	0.05 (0.011)*	0.05 (0.011)*	0.049 (0.011)*
WHOLES	0.006 (0.014)	0.013 (0.015)	0.007 (0.014)	0.013 (0.015)	0.01 (0.015)
TRANSP	0.043 (0.016)*	0.048 (0.016)*	0.044 (0.016)*	0.048 (0.016)*	0.044 (0.016)*
PUBAD	0.01 (0.009)	0.007 (0.01)	0.009 (0.01)	0.007 (0.01)	0.008 (0.01)
Firm Size- Reference group is FIRMSIZE4					
FIRMSIZE1	-0.174 (0.01)*	-0.177 (0.01)*	-0.175 (0.01)*	-0.177 (0.01)*	-0.173 (0.01)*
FIRMSIZE2	-0.095 (0.008)*	-0.095 (0.008)*	-0.095 (0.008)*	-0.095 (0.008)*	-0.093 (0.008)*
FIRMSIZE3	-0.063 (0.012)*	-0.063 (0.012)*	-0.064 (0.012)*	-0.063 (0.012)*	-0.062 (0.012)*
FIRMSIZE5	-0.01 (0.013)	-0.06 (0.013)	-0.01 (0.013)	-0.06 (0.013)	-0.07 (0.013)
Degree Classification- Reference group is DEGR4					
DEGR1	-0.003 (0.017)	-0.002 (0.017)	-0.003 (0.017)	-0.002 (0.017)	-0.001 (0.017)
DEGR2	-0.009 (0.009)	-0.009 (0.008)	-0.009 (0.009)	-0.009 (0.009)	-0.007 (0.009)
DEGR3	0.004 (0.009)	0.004 (0.008)	0.004 (0.009)	0.004 (0.008)	0.004 (0.008)
DEGR5	0.022 (0.008)*	0.021 (0.008)*	0.022 (0.008)*	0.022 (0.008)*	0.022 (0.008)*
Geographical location of the university attended by the graduate- Reference group is NOWEST					
NOEAST	-0.022 (0.008)*	-0.02 (0.008)*	-0.021 (0.008)*	-0.02 (0.008)*	-0.019 (0.008)*
CENTRE	-0.033 (0.009)*	-0.031 (0.009)*	-0.032 (0.009)*	-0.031 (0.009)*	-0.032 (0.009)*
SOUTH	-0.089 (0.01)*	-0.089 (0.01)*	-0.089 (0.01)*	-0.089 (0.01)*	-0.087 (0.01)*
AREAUNK	-0.032 (0.013)*	-0.029 (0.013)*	-0.032 (0.013)*	-0.029 (0.013)*	-0.031 (0.013)*
Occupation- Reference group is PROF2					
PROF1	0.035 (0.007)*	0.022 (0.007)*	0.032 (0.007)*	0.022 (0.007)*	0.023 (0.007)*
PROF3	-0.077 (0.021)*	-0.073 (0.02)*	-0.075 (0.021)*	-0.074 (0.02)*	-0.077 (0.02)*
Education job-match					
OVERED		-0.052 (0.007)*		-0.055 (0.008)*	
UNDERED		-0.007 (0.014)		-0.008 (0.014)	
EDMIS					-0.037 (0.007)*
Skill-job match					
SKIMIS			-0.015 (0.006)*	0.004 (0.007)	
Number of observations	7,484	7,484	7,484	7,484	7,484
Likelihood Ratio Index	0.12089	0.12360	0.12118	0.12362	0.12222

* denotes significance at five per cent level

** denotes significance at ten per cent level

Table 5: Marginal Effects for Binomial Logistic Regression - Estimation for the Probability of 'Seeking Employment' Compared to the Reference Category of 'Not Seeking Employment' (standard errors in parentheses)

	Specification 1	*Specification 2*	*Specification 3*	*Specification 4*	*Specification 5*
Constant	-0.256 (0.211)	-0.724 (0.218)*	-0.697 (0.216)*	-0.904 (0.220)*	-0.371 (0.213)**
MALE	-0.160 (0.057)*	-0.150 (0.058)*	-0.166(0.058)*	-0.156 (0.058)*	-0.156 (0.057)*
MARCOHA	-0.082 (0.058)	-0.077 (0.059)	-0.073 (0.059)	-0.073 (0.060)	-0.091 (0.058)
CHILD	0.025 (0.134)	0.015 (0.137)	0.004 (0.137)	0.004 (0.138)	0.013 (0.134)
ITAL	-0.019 (0.180)	0.029 (0.184)	0.014 (0.183)	0.037 (0.185)	-0.025 (0.180)
Age- Reference group is AGE1					
AGE2	0.041 (0.065)	0.018 (0.066)	0.026 (0.066)	0.013 (0.067)	0.034 (0.065)
AGE3	0.097 (0.085)	0.051 (0.087)	0.075 (0.086)	0.047 (0.088)	0.087 (0.085)
AGE4	0.265 (0.103)*	0.237 (0.105)*	0.261 (0.104)*	0.242 (0.106)*	0.250 (0.103)*
AGE5	0.114 (0.080)	0.071 (0.002)	0.091 (0.081)	0.066 (0.082)	0.098 (0.080)
POSTQUAL	0.287 (0.089)*	0.301 (0.091)*	0.297 (0.091)*	0.306 (0.092)*	0.301 (0.090)*
EXP	-0.041 (0.051)	-0.025 (0.059)	-0.018 (0.052)	-0.013 (0.053)	-0.040 (0.051)
TENURE	-0.232 (0.058)*	-0.256 (0.059)*	-0.248 (0.059)*	-0.262 (0.060)*	-0.233 (0.058)*
Amount of time spent on-the-job training- Reference group is ONJTR2					
ONJTR2	0.006 (0.071)	-0.028 (0.072)	0.018 (0.071)	0.031 (0.072)	0.014 (0.071)
ONJTR3	-0.276 (0.061)*	-0.239 (0.062)*	-0.277 (0.062)*	-0.249 (0.063)*	-0.267 (0.061)*
Social class- Reference group is SOCLA2					
SOCLA1	-0.141 (0.06)*	-0.129 (0.061)*	-0.146 (0.061)*	-0.135 (0.061)*	-0.140 (0.06)*
SOCLA3	0.136 (0.064)*	0.127 (0.066)*	0.118 (0.065)**	0.116 (0.066)**	0.130 (0.064)*
SOCLA4	-0.253 (0.116)*	-0.285 (0.119)*	-0.268 (0.118)*	-0.289 (0.120)*	-0.254 (0.116)*
Subject of study- Reference group is ECON					
SCIENCE	0.128 (0.079)	0.066 (0.081)	0.005 (0.081)	-0.003 (0.082)	0.128 (0.080)
MEDIC	-1.022 (0.170)*	-0.996(0.171)*	-1.084 (0.173)*	-1.044 (0.173)*	-0.985 (0.170)*
ENGTECH	0.051 (0.076)	0.059 (0.077)	0.020 (0.077)	0.034 (0.078)	0.087 (0.076)
POLSC	0.344 (0.118)*	0.281 (0.12)*	0.189 (0.121)	0.190 (0.123)	0.299 (0.119)*
LAW	-0.112 (0.103)	-0.128 (0.105)	-0.116 (0.104)	-0.128 (0.106)	-0.113 (0.104)
ARTS	0.011 (0.094)	-0.136 (0.096)	-0.129 (0.096)	-0.196 (0.097)*	-0.057 (0.095)
Industry- Reference group is FINANCE					
AGRIC	0.645 (0.207)*	0.628 (0.212)*	0.755 (0.21)*	0.706 (0.212)*	0.654 (0.207)*
MANUF	0.356 (0.078)*	0.377 (0.081)*	0.391 (0.081)*	0.397 (0.082)*	0.376 (0.080)*
COSNTRU	0.224 (0.093)*	0.221 (0.094)*	0.235 (0.095)*	0.230 (0.096)*	0.229 (0.093)*
WHOLES	0.565 (0.115)*	0.450 (0.119)*	0.495 (0.118)*	0.431 (0.120)*	0.534 (0.116)*
TRANSP	0.108 (0.136)	-0.010 (0.14)	0.053 (0.137)	-0.016 (0.141)	0.095 (0.136)
PUBAD	0.252 (0.079)*	0.335 (0.08)*	0.321 (0.081)*	0.362 (0.081)*	0.269 (0.079)*
Firm Size- Reference group is FIRMSIZE4					
FIRMSIZE1	-0.459 (0.085)*	-0.402 (0.122)*	-0.415 (0.086)*	-0.341 (0.123)*	-0.462 (0.085)*
FIRMSIZE2	0.113 (0.112)**	0.132 (0.111)**	0.150 (0.113)*	0.11 (0.114)	0.103 (0.069)
FIRMSIZE3	-0.070 (0.134)	-0.074 (0.102)	-0.036 (0.101)	-0.122 (0.137)	-0.082 (0.1)
FIRMSIZE5	0.168 (0.107)	-0.107 (0.110)	0.161 (0.110)	-0.125 (0.11)	0.145 (0.108)
Degree Classification- Reference group is DEGR4					
DEGR1	-0.004 (0.141)	-0.023 (0.145)	-0.010 (0.143)	-0.023 (0.146)	-0.016 (0.142)
DEGR2	0.044 (0.073)	0.044 (0.072)	0.027 (0.075)	0.032 (0.075)	0.030 (0.073)
DEGR3	0.079 (0.070)	0.076 (0.071)	0.081 (0.071)	0.077 (0.072)	0.077 (0.070)
DEGR5	-0.073 (0.070)	-0.054 (0.071)	-0.060 (0.071)	-0.049 (0.072)	-0.068 (0.070)
Geographical location of the university attended by the graduate- Reference group is NOWEST					
NOEAST	-0.046 (0.067)	-0.085 (0.068)	-0.070 (0.068)	-0.092 (0.069)	-0.064 (0.067)
CENTRE	0.206 (0.075)*	0.184 (0.077)*	0.177 (0.077)*	0.167 (0.078)*	0.202 (0.076)*
SOUTH	0.397 (0.080)*	0.417 (0.081)*	0.414 (0.081)*	0.424 (0.082)*	0.393 (0.080)*
AREAUNK	0.349 (0.107)*	0.307 (0.110)*	0.366 (0.109)*	0.330 (0.111)*	0.346 (0.107)*
Occupation- Reference group is PROF2					
PROF1	-0.392 (0.058)*	-0.143 (0.061)*	-0.246 (0.060)*	-0.105 (0.062)*	-0.308 (0.061)*
PROF3	0.356 (0.161)*	0.321 (0.167)*	0.279 (0.165)**	0.278 (0.168)*	0.359 (0.162)*
Education job-match					
OVERED		1.064 (0.062)*		0.794 (0.067)**	
UNDERED		0.364 (0.118)*		0.231 (0.120)**	
EDMIS					0.267 (0.061)*
Skill-job match					
SKIMIS			0.851 (0.052)*	0.584 (0.058)*	
Wage- Reference group is between 1,501 - 2,000 thousands of Liras					
< 1,500 thousands of Liras	0.323 (0.074)*	0.338 (0.076)*	0.352 (0.076)*	0.355 (0.077)*	0.331 (0.075)*
2,000 - 3,000 thousands of Liras	-0.314 (0.061)*	-0.231 (0.063)*	-0.287 (0.062)*	-0.233 (0.063)*	-0.285 (0.062)*
>3,000 thousands of Liras	-0.820 (0.133)*	-0.698 (0.134)*	-0.793 (0.135)*	-0.704 (0.135)*	-0.807 (0.133)*
Number of observations	7,484	7,484	7,484	7,484	7,484
(-)2 Log Likelihood	9414.598	9107.59	9146.683	9005.291	9395.759
Nagelkerke - R^2	0.104	0.154	0.148	0.171	0.107

* denotes significance at five per cent

** denotes significance at ten per cent