ISSN 1791-3144

**University of Macedonia
Department of Economics**

Discussion Paper Series

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Accounting for the Symptom of long duration for
studies in Greece**

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Discussion Paper No. 04/2011

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March 2011

ABSTRACT

This study employs administrative and survey data to assess the relationship between students' socioeconomic background and educational outcomes, using regression and quantile regression methods. We take into account the existing institutional framework which allows differentiation in the duration of studies among students. We examine the association of students' status – working and non-working – with degree grades and whether the documented negative influence of long duration of studies on grades is associated to students' status. The findings reject both hypotheses; working students do not achieve lower grades than their non-working peers; the negative impact of the length of studies on grades is not linked to status, and affects both working and non-working students in the same way.

Keywords: working students, academic performance, duration of studies.

JEL : I20, I23

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1. Introduction

The expansion in the number of university students across the OECD countries in the last two decades has raised a number of concerns regarding the quality of studies in the higher education institutions. Research has drawn attention on three possible negative influences. The first is the fall in the entry qualifications. Less able students, considered unsuitable for higher studies in the past, are now given an opportunity to access higher education institutions (Shofer & Meyer, 2005; Trow, 2007). The second concerns falling resources per student. In many countries spending in higher education did not keep pace with the rising number of students (OECD, 2007); thus spending per student has declined, with two possible implications: firstly the quality of teaching may have deteriorated (Ghosh & Rodgers, 1999; Rodgers & Ghosh, 2001) and secondly, students' performance may have fallen, as many students, faced with a declining per student state support (Blanden & Machin, 2004), may have undertaken paid work in order to cope with the burdens of study. The third stems from potential changes in the students' social composition. The expansion in the number of students may have increased the participation of students from lower socioeconomic background. Thus, the fraction of students who have to work in order to finance their studies may also have increased impacting adversely on academic performance (Bratti, Checchi & de Blassio, 2008; Metcalf, 2003).¹

These three concerns are also relevant in the context of higher education in Greece. Over the last 25 years Greece, following the example of its European partners, has expanded the number and the diversity of higher education entrants substantially. Taking into account both types of tertiary education institutions, Universities and Technological Institutes, the number of new students, passing through the traditional mode of general examinations, quadrupled; from 21,642 in 1980 it went up to 40,840 in 1994 and then to 82,225 in 2000 (ME, 2008). The expansion in the number of entrants in association with the dramatic fall in the number of school leavers has brought Greece into the group of countries with the highest enrolment rates². In 2009, for example, 91,320 candidates competed for 83,490 available places (91%) divided roughly equally between universities (40,180 places) and Technological Institutes (43,310 places) (ME, 2009b). At the same time, there was a parallel increase in the number of students entering universities through other modes. Today, non-traditional qualifications students represent about 15% of the

student body but their allocation between institutions and subjects varies considerably (Lakasas, 2007; ME, 2009a).

The purpose of this study is to explore the association between students' socioeconomic background and educational outcomes in Greece³. We focus on the relative performance between working and non-working students. In the same time, the relevance of other socioeconomic variables is also examined in connection to the long duration of studies, one of the main characteristics of the Greek university system. To accommodate unfamiliar readers and position the research question into context, it would be useful to provide a brief account of the institutional framework and the recent research findings in the area.

Since the restoration of democracy in 1974 Greek students enjoyed a highly permissive regime which allowed for an unlimited time frame for the completion of studies. There were no rules in place for students to show progress in each semester or year. In practice, once students had succeeded in entering a university department, they acquired an attribute that accompanied them for life. Moreover, students had the right, until attaining a pass mark, to repeat the exams of a course unlimited times. The repetition of the exams did not presuppose repeating the course since for the overwhelming majority of university studies attendance at lectures was, and still is, not compulsory.

This framework became synonymous with two symptoms. First, for a large number of students university studies turned out to be studies at a distance. Absenteeism was a widespread phenomenon and on occasions it could reach levels as high as 90% (Psacharopoulos, 1988).

Second, students who complete studies at the expected length of degrees represent a minority. Research at three university institutions has shown that the proportion of these students ranges from 12% to 27%; the majority prolongs studies beyond the expected duration of the programme, some times by many years (Chatzipantelis, 2004; Kalamaras & Kalamatianou, 2006; Kalamatianou & McClean, 2003; Katsikas & Katranidis, 2006).

Further, it has been documented that the prolonging of studies is strongly associated with degree grades. It has been estimated that each additional year of staying at the university is associated with a fall in students' grade-point average (GPA) by half of a unit. The longer the time a student needs for the acquisition of his/her degree the lower the grade-point of the degree (Katsikas & Dergiades, 2009).

The subject of this research has been largely prompted by the above evidence; to elaborate on the relationship between long duration of studies and falling grades. Therefore, the aim of this paper is twofold. On the one hand, to discuss the determinants of students' grades paying attention on the evidence that the length of studies is the strongest covariate of students' grades; this occupies a small part in the paper. The second is to use the same data to examine whether the underlying factor behind the effect of the length of studies on grades is the status of students; that is whether duration of studies and falling grades affect working students differently. In the Greek context, the two issues are inextricably linked. The institutional framework allowed students to stay at the university for an unlimited amount of time until degree completion. From an economic point of view, however, such behaviour is not rational. Longer duration of studies implies a higher direct and indirect cost (in the form of foregone earnings) for students' families. It might make sense only if students, taking advantage of the lax regulatory framework, prolonged studies on purpose to achieve higher grades, which is not the case. It is important, therefore, to explore the factors that make students behave in such a way. Consequently, we examine whether students' socioeconomic background can explain students' differences in the length of studies.

The paper is structured in the following way. In section 2 we discuss the data and the relevance of the variables used in the context of the Greek university system. Section 3 deals with a methodological question and briefly reviews the literature. The model and its method of estimation are presented in section 4 while section 5 presents and discusses the results and the last concludes.

2. Data and background information

Our data set refers to a sample of students that entered the *University of Macedonia, Economic and Social Studies* (UoM) in two consecutive academic years 1998 and 1999. Students of these two cohorts have already completed 10 years of studies, thus providing us with sufficient time-span for assessing the academic progress of each one of them i.e. whether they have already acquired their degree, the years required for the acquisition of the degree, and the average grade of the degree for those who have completed studies. Although in principle the time-span of our research could be increased by going further backwards, such an increase would have been achieved at the cost of reducing the number of the departments included in the research. Between 1996 and 1998 three new

departments were added to the already existing (five) departments of UoM. With the exception of one department – *Music Studies and Art* – the subject of economics is a major or joint major. Of the ten departments operating in UoM today eight are included in the sample. Two departments have been in existence for less than six years and for this reason they were excluded from the study.

To assess the association between students' status and grades we combine information from both administrative and survey sources. The information concerning the academic profile of students comes from the secretariat of the departments and includes:

The *GPA* achieved by the graduates. It is measured in the scale of 0 to 10 (maximum); the pass mark on all courses is 5.

The actual *duration of studies* for each one of the graduating students measured in additional years over the expected duration of the programme which is 4 years. Students who failed to graduate within 8 years will be considered as drop-outs. The choice of 8 years as a dividing line reflects the maximum time a student can stay at the university, following legislation put forward in 2007⁴.

Gender; our sample comprises 319 male (37%) and 548 (63%) female students and is fairly close to the gender composition of the student population which is 38.4% and 61.6% respectively.

The *entry score* in the university entry examinations; it plays the role of student's initial qualifications.

The *permanent family residency*; it gives an account of the differences in the private cost of studies among students. No tuition fees are charged in the Greek system; food, traveling expenses and above all, rent for house accommodation, comprise the greatest bulk of private expenses (Psacharopoulos & Papakonstantinou, 2005). In our sample 37% of students' families live within the university's region and 63% come from the rest of Greece. The sample and the population distributions on this account are identical.

The *rank of the department of entry*; candidate students rank the courses they want to follow; they are asked in advance to express (rank) their preferences in descending order. This was done prior to their university entry examinations. It has to be noted that the process of ranking concerns preferences among relative courses, that is courses falling within the chosen direction (broad disciplines) on which candidates have decided while at the secondary school.

With regard to the, *rank of the department of study* and *permanent family residency*, it is interesting to note that in the Greek university entry system candidate students choose primarily the subject to study and not the institution. Customarily, the decision on the institution is taken on the ground of its proximity to their family residence provided of course that it offers the subject of their interest. This gives rise to a large proportion of students living with their parents alongside studying and, significantly, it applies to all income groups; from the student's family point of view, given the absence of any official ranking of the universities, it makes no sense to choose a long distanced institution for they all enjoy the same reputation. In the Greek context, therefore, living with parents whilst studying is not an indication of financial hardship. This contrasts Greece with the experience in other countries where living arrangements are associated with family's income⁵.

The *age of the student when entering university*; prospective students take the university entry exams immediately after finishing the secondary school. Thus, their university entry age rarely exceeds 20 years; for the vast majority of entrants age ranges from 17 to 20. Those who fail to pass the exams in their first attempt or pass to a department ranked low in their preferences may take a second or a third attempt. It is interesting, therefore, to see whether the number of attempts to enter university affects subsequent degree performance.

The *department of study*; all students admitted in the institution take the same entry exams; thus, their educational background is similar. Their allocation however in the various departments depends on a combination of their ranking on the one hand and the achieved score in the exams on the other. Given that the number of students that are admitted in each department is centrally determined, it follows that departments with high demand maintain high entrance thresholds – defined as the minimum required score to enter a department – and receive accordingly a high proportion of relatively better candidates.

The information concerning the *status* of students – working or non-working – comes from a survey conducted by means of a structured questionnaire (phone interviews). University leavers were asked to provide information on the following questions: Whether they worked alongside studying and the hours of employment per week. It turned out, however, that many working students, due to the sporadic and irregular nature of their employment in activities such as bars, phone services, delivery, sales' promotion etc, faced difficulties to provide a reasonable account of the hours of

employment. On the other hand, following our instructions, they could easily identify their job as part-time or full-time respectively. Fewer hours than the normal working day or fewer days than the 5-days week were classified as part time employees. Ex-students were also asked about the stage (year of study) at which employment commenced; they were also invited to give their judgment as to whether their engagement in paid employment affected negatively the process of studies.

Finally, respondent students were asked about the level of education of their parents. Traditionally, parental education and parental occupation or income, have been taken as key indicators of social class. Several studies in the UK have offered empirical support to the view that the various measures of social class are significant determinants of higher education participation and attainment (Blanden & Machin, 2004; Blundell, Dearden, Goodman & Reed, 2000; Smith & Naylor, 2001b)⁶. In this study we are concerned with the relationship between parental education and students' grades. Income data might provide a better account of the social stratification in Greece but they would be less reliable. Given the widespread practice in the country to report lower income for tax purposes asking questions about the family income would raise suspicions about the intentions of the research. Parental education, on the other hand, raises less suspicion and in the Greek context, as it happens in many other countries, it is closely associated with earnings. Returns to education in Greece are increasing across the spectrum of educational levels and although they have declined in late 1970s and 1980s they appear to be rising again after 1990s (Lambropoulos & Psacharopoulos, 1992; Patrinos, 1995; Tsakloglou & Cholezas, 2005). It is interesting to note that parental education, used coincidentally with students' status, might also pick up cultural differences effects.

To preserve the homogeneity of our sample we have included only students that entered UoM through the system of general examinations. All other categories of students, with non traditional qualifications, were excluded. This second group of students is highly heterogeneous with regard to their qualifications and hence abilities to pursue a university degree.

The total number of students that entered the eight departments of UoM via the mode of general examinations in 1998 and 1999 is 1,728 students. Of these students 128 or 7.4% failed to graduate after 8 years of studies. Of the remaining 1,600 we managed to contact and compile questionnaires for 867 students, that is, 54.2% of the reference population. This number (867) represents our final sample on which estimation is

conducted and is composed by 303 working and 564 non-working students, 35% and 65% respectively⁷.

The failure to contact the entire population of the graduated students is due to a variety of reasons: lack or not accurate recording of phone numbers; changed phone number either because they changed also domicile or for some other reason (privacy for example); failure to achieve a response after several call trials; refusal of a small number of ex-students to participate in the survey; no further effort to contact ex-students living or studying abroad.

We have no reasons to believe that the above introduces a bias into our sample. Table 1 reports the descriptive statistics of our sample. The GPA of the graduated students (second row in the table) is close to the score of students incorporated in the sample (third row in the table). The data do not display differences in performance between working and non-working students. By way of contrast, the rest of the reported variables, duration of studies, rank of the department, age, and department of study seem all to be associated with achievement. It remains to be seen whether these associations persist after controlling for students' initial qualifications.

Table1. Summary statistics on key variables

Variable		Males	Females	All
Completion rate (after 8 years of studies)	(N=1,728)	89.5%	94.3%	92.6%
Average grade of the graduated students	(N=1,600)	7.08	7.26	7.20
Average grade of the contacted students	(N= 867)	7.03	7.22	7.15
Degree grade over the status of students				
Working	303 (35%)	7.00	7.20	7.12
Non-working	564 (65%)	7.04	7.22	7.16
Degree grade over the duration of studies				
4 years (the expected length of degrees)		7.48	7.59	7.56
5 or 6 years		6.95	7.01	6.98
7 or 8 years		6.29	6.73	6.54
Degree grade over the rank				
1-3		7.17	7.31	7.26
≥4		6.92	7.14	7.06
Degree grade over the age of entry				
17 or 18 years		7.23	7.33	7.29
>18 years		6.87	7.11	7.06
Degree grade over the department of study				
Economics		6.75	6.96	6.90
Business Administration		6.82	6.92	6.89
Accounting & Finance		6.94	7.07	7.01
Applied Informatics		7.50	7.44	7.47
Education and Social Policy		7.38	7.72	7.68
European & International Studies		7.61	7.77	7.71
Balkan and Slavic Studies		7.42	7.43	7.43
Music Studies and Art		8.20	8.55	8.43

3. A caveat on the methodology

Since we focus on degree grades as a means of comparing performance between working and non-working students our sample has been drawn from the population of students who have graduated within 8 years of studies; those who failed to do so were left out of the investigation. Proceeding in this way may raise two types of questions; the first concerns the choice of the index. From a socio-economic point of view, the effect of status on students' withdrawals is probably more noteworthy than that on grades (MacFarlane, 1993; Powdthavee & Vignoles, 2008; Yorke, 1998). This is evidenced in the relative volume of literature; students' financial and social circumstances have been analysed more extensively in relation to retention and completion rates than in relation to grades (see for example, Davies & Rudden, 2000; Dynarski, 2005; Ishitani & Desjardins, 2003; Johnes, 1990; Singell, 2004; Martinez, 2001; Martinez & Munday, 1998. A recent exception focusing on grades is Callender, (2008)).

The choice of the appropriate index of performance cannot be abstracted from the institutional framework in which the research is conducted. The emphasis of the literature on drop out rates is associated with the implicit mechanism through which the effect takes place. It is the rising tension between the time spent on work on the one hand and studies on the other that drives students to withdraw (Bennett, 2003; McNabb, Pal & Sloane, 2002). In this respect the focus on drop out rates is justified by the fact that the highest rates of attrition in most western countries take place during the first or second years of studies (Johnes & McNabb, 2004; MacMillan, 2005; Yorke & Thomas, 2003).

In the Greek university framework, however, tension in time is not an operational mechanism. The unlimited timeframe allowed students to take a slower path to their studies, that is, to participate in the exams of as many courses per semester as required in order to cope successfully with both employment and studies. Consequently, students' withdrawal takes place at much later stage than it does in other countries. As a matter of fact it is difficult to draw a line between active and withdrawn students. Even students that stay at the university longer than 10 years cannot be considered as definite withdrawals. It has been estimated that approximately one out of three of those students staying at university longer than 10 years will manage to acquire his/her degree at a later stage (Katsikas & Dergiades, 2006). Failure rates, therefore, defined here in accordance

with the new legislation at eight years of studies, i.e. after 4 years beyond the expected length of degree, cannot be regarded as the effect of the rising tension between work and studies.

Degree grades, on the other hand, might be more sensitive to students' status than drop out rates. This may stem from the institutional nature of the programmes. University studies in Greece are assumed to be full time. Formally speaking, part-time status of students and programmes does not exist. The implication is that working students are usually unable to attend lectures and classes. This internal inconsistency of the system – full-time programmes and part-time students – might be the causal factor behind the strong association between grades and duration of studies. Students who need many years to acquire their degree are probably the working students; they try hard but nevertheless face difficulties in passing the course exams; these difficulties are reflected in their low degree grade.

If this hypothesis is correct, i.e. working students achieve lower grades than non-working students, then, status may also be related to failure rates. This may occur in an indirect way. Bennett (2003) describes an iterative procedure through which employment may affect drop out rates; high levels of stress, caused by students' efforts to balance long periods of paid employment and academic study, might adversely affect students' grades; in their turn, low grades may act as a de-motivating factor leading, potentially, to students' withdrawing.

This possibility brings us back to the second point noted above concerning the methodology adopted in this study. Excluding from the sample students who have not graduated, our analysis cannot take a full account for the association between status and grades. We may think, for example, that some of the non-graduated students have already abandoned studies due to their low scores achieved in some tested courses. To examine the association between status and grades we should be able to incorporate the average score achieved by the non-graduated students as a grade outcome. We were unable to retrieve this information.

The importance of this analytical weakness should not be overestimated. The probability for Greek students to abandon studies because of low course grades is very small. The emphasis of university studies in Greece is on 'passing' the courses and 'getting' the degree rather than on the grade of the degree. Probably this is associated to the way that university degrees are evaluated by the labour market; the process of job attainment seems to be more important than personal ability in obtaining employment

(Patrinos, 1995). At any rate the side effect of grades on attrition is provisional on the assumption that grades are, at first place, linked to students' work.

4. Model specification and estimation

Degree performance is measured by GPA and represents our dependent variable. This is calculated as a simple average of all grade courses the number of which ranges from 40 to 50 for each department. In the Greek grade system grades are given in numerical values that range from 5 to 10 and are fairly precise in the sense that it contains an integer number and a fraction of two decimal points (for example, 7.15). Thus, between two consecutive integers we can have, potentially, 100 different observations. This allows us to treat GPA as a continuous variable and apply standard regression techniques in the analysis of data.

The general specification of our estimated model is provided by equation (1):

$$GPA = Constant + \beta_1 Years\ of\ Studies + \beta_2 (Years\ of\ Studies)^2 + \beta_3 Gender + \beta_4 Family\ Residence + \beta_5 Age\ of\ Entry + \beta_6 Score\ in\ Entry\ Exams + \beta_7 Rank\ of\ the\ Department\ of\ Entry + \beta_8 Department\ of\ Study + \beta_9 Status\ of\ Students + \beta_{10} Parental\ Education + error\ term. \quad (1)$$

The meaning and the relevance of all right-hand variables have been discussed in section 2. A quadratic term of the years of studies is included to capture the rate of fall of students' grades with the addition of years of staying at the university. Table 2 below summarizes all right hand-side variables included in the model as well as their specification.

Table 2. The right-hand side variables

Variable	Specification
Duration of studies	Actual years of studies minus 4. The derived estimate will measure the average fall in the grade of the degree for each additional year of studies. Thus, for students completing studies after four years we use the value of zero, for those needing 5 years the value of one and so forth up to 4 years of delay.
Gender	0 for Men, 1 for Women
Family residence	0 for Thessaloniki, the university's location. It refers to students living with their parents alongside studying. 1 for elsewhere; the value of 1 indicates students living in rented apartments.
Age of university entry	We create two age bands and give the value of 0 for ages of 17 and 18, 1 for the rest. It captures the effect of the number of attempts to university entry.
Score in entry exams	This is a continuous variable. To normalize score differences observed between the two cohorts we use relative entry scores. Thus, we divide the entry score of each student by the respective entrance threshold of the Department of Economics
Rank of the department of entry	We specify two rank bands: 0 for rank 1-3 1 for rank ≥ 4
Department of study	The dummy on the department of study has 8 levels. The Department of Economics is the reference category, and thus, omitted (value zero in estimation); D1, D2... D7 for the rest (Departmental names available upon request).
Parental education	We give the value of 0 for up to 6 years of schooling 1 for up to 9 years of schooling 2 for up to 12 years of schooling 3 for higher studies 4 for post graduate studies
Status of students (Working-non working)	0 for working students 1 for non-working

Equation (1) is estimated using Ordinary Least Squares (OLS) where each coefficient will provide the average response in the dependent variable as a result of a change in the independent, *ceteris paribus*. However in this case it would also be interesting to see what is the median response. For the latter we also employ a method that focuses on the distributional properties of the dependent variable (grades). Quantile Regression (QR), introduced by Koenker and Basset (1978), is based on the minimization of the asymmetrically weighted sum of absolute errors. Denoting y_t as grade, $\mathbf{X}_t$ a matrix with all the independent variables and $\boldsymbol{\beta}$ a vector with the corresponding coefficients, we can write the optimization problem as:

$$\min_{\boldsymbol{\beta}} V_{\tau}(\boldsymbol{\beta}) = \tau \sum_{y_t \geq \mathbf{X}_t' \boldsymbol{\beta}} |y_t - \mathbf{X}_t' \boldsymbol{\beta}| + (1 - \tau) \sum_{y_t < \mathbf{X}_t' \boldsymbol{\beta}} |y_t - \mathbf{X}_t' \boldsymbol{\beta}| \quad (2)$$

where τ represents the quantile under study. For low quantiles, i.e. for $\tau = 0.05, \dots, 0.45$ of the dependent variable, the observations below the specific quantile are more heavily weighted. The opposite is true for higher quantiles ($\tau = 0.55, \dots, 0.95$). This is an immediate consequence of the fact that the $100\tau\%$ ($100(1-\tau)\%$) of the probability mass of y locates below (above) the quantile τ . For the median, $\tau=0.5$, the problem reduces to the minimization of the equally weighted absolute errors (known as the problem of Least Absolute Deviations-LAD).

Minimizing (2) with respect to $\boldsymbol{\beta}$ is equivalent to a linear programming problem. In the present context, the parameter, say β_1 , estimated at the specific quantile τ_t is interpreted as the *change of grade at this specific quantile* (and not *at the conditional mean* as in the OLS case) associated with one unit change in the *years of studies*. Moreover, in a quantile framework, no distributional assumptions about the error term are required rendering it a distributionally robust method of modeling relationships among variables (see also the discussion in Koenker 2005). The approach would allow us to assess potential asymmetries in the relationship between the variables.

Table 3. OLS and Quantile Regression Results – Dependent Variable GPA

	Model 1 OLS	Model 2 QR
C	6.279074 (0.00)	6.576357 (0.00)
GENDER	0.032109 (0.43)	0.049681 (0.31)
DURATION	-0.546279 (0.00)	-0.476148 (0.00)
DURATION^2	0.074806 (0.00)	0.056138 (0.00)
RESIDENCE	-0.028913 (0.06)	-0.042761 (0.03)
ENTRY SCORE	1.164595 (0.06)	0.689156 (0.73)
RANK	-0.094533 (0.03)	-0.035434 (0.53)
AGE OF ENTRY	-0.142214 (0.00)	-0.130674 (0.01)
STATUS	-0.022724 (0.57)	-0.006761 (0.90)
PARENTAL SCHOOLING	-0.002223 (0.90)	0.017148 (0.44)
D1	-0.100016 (0.03)	-0.057998 (0.35)
D2	-0.137759 (0.06)	-0.124929 (0.33)
D3	0.230237 (0.00)	0.323277 (0.02)
D4	0.534526 (0.00)	0.562368 (0.00)
D5	0.754229 (0.00)	0.834042 (0.00)
D6	0.34008 (0.00)	0.327086 (0.06)
D7	1.980791 (0.00)	1.977865 (0.00)
Adjusted R-squared	0.494	0.279
F-statistic	53.749	
Prob(F-statistic)	0.00	
Quasi-LR statistic		455.093
Prob(Quasi-LR stat)		0.00

Notes: For the OLS estimates White Heteroskedasticity-Consistent Standard Errors & Covariance are employed whereas for the QR the Huber Sandwich Standard Errors & Covariance; *p*-values are reported in parenthesis below each coefficient.

Before we proceed with the discussion of the results, we will comment on the econometric properties of the models although this is not the focus of the paper. With regard to the OLS regression there is evidence that some Heteroscedasticity is present through the White's test and this is why we have employed the White Heteroscedasticity consistent standard errors. The adjusted R-squared implies that 49% of the variability in grades can be explained by the regression line in the case of the OLS and 28% in the case of the quantile regression. The p -value of the F -stat for OLS and of the quasi-LR for the quantile regression denotes that the two regressions are significant.

With regard to the significance of the estimated coefficients gender is not significant under both specifications (OLS and QR) and so is status and parental schooling. The coefficients of duration, $(\text{duration})^2$, residence, age of entry and most of the departmental dummies are significant at the conventional levels. Under OLS the coefficient attached to the entry score and rank seem to be significant (positive the former and negative the latter) and insignificant with QR. However this apparent disagreement is not accurate as when we move at higher quantiles (0.7, 0.8 and 0.9) these coefficients become positive and significant and negative and significant respectively under QR as well (Figure 1).

-Insert Figure 1 here-

5. Results

The above estimated model can be understood as the reduced form of a more general model comprising three composite variables. Each one of them is identified by the fact that allocates the relative responsibility of educational outcomes on three key factors. The first is student-innate ability and motivation. We inscribe to this factor the influence of the following variables: entry score, age, rank and gender. The second factor accords the influence of variables which describe the socioeconomic background of students; in our case they are: student status, residence, and parental education. The third factor traces the responsibility of institutions. In the estimated model this is reflected in the impact of departmental dummies.

The only variable left out of this classification is duration of studies. Lack of space here prevents us from indicating that the effect of this variable is inscribed to the institutional factor as well.

5.1 Explaining the results

Four points are worth commenting here. The first concerns the impact of the duration of studies variable; its association is the strongest among all variables (higher *t*-stat). The estimated effect suggests that each additional year of staying at the university is associated with a drop in GPA by 0.55 units. To give a concrete example, if a student takes 5 years to complete his/her studies and achieves a GPA of 7.55, the corresponding grade of a student needing 6 years to acquire his/her degree will be 7.00. This is a remarkable effect and confirms the conclusion drawn by an earlier study which stated that 'good students are those who complete studies early' (Katsikas & Katranidis, 2006).

The second point concerns the institutional effect. With the exception of two departments, D1 and D2, whose negative association although statistically significant at the 10% level, is rather small (0.10 and 0.14 units respectively), the rest show notably higher scores with respect to the benchmark (Department of Economics). D7 awarding degrees by almost two units higher than those of the reference department represents an extreme case while for the remaining four, D3, D4, D5 and D6 the difference ranges from 0.23 to 0.75 units.

Without further investigation it is difficult to tell what lies behind the effect of the institutional factor. International literature has suggested two explanations. The first raises the possibility of non-equivalence of degrees awarded by institutions and subjects (Crouse, 1985; Hanford, 1985; Elliott & Strenta, 1998). It is suggested that when academic standards are applied in a uniform way any variation in mean grades in the same subject from one institution to another should be random and insignificant (Bratti, 2002). By way of contrast, systematic differences in average performance over time and across institutions and subjects should call into question the assumption that a first class degree in one place or subject carries similar weight to a first class degree in any other (Hoskins, Newstead, & Dennis, 1997; Smith & Naylor, 2001b).

According to the second interpretation differences in degree performance across schools and colleges are primarily the result of institutional practices. It is maintained that after controlling for the individual characteristics of students the remaining differences should be considered as measures of the effectiveness of the teaching process. There exist two variations to this approach which for the purpose of this analysis we treat as equivalent. The first emphasizes aspects of the institutional and course setting. In this

respect, class size and the degree of its homogeneity have been identified as major influences on students' outcomes (Entwistle, 2004; Hounsell, et al, 2005; McCune, 2003; Vermunt, 2007). The second variation conceives of education as a social process and of educational units as distinct communities of practice (Lave & Wenger, 2005). Depending on the nature of their members' participation, classified as core and peripheral, or even marginal, departments may function as strong or weak communities of practice (Wenger, 1998); the larger the department, perhaps, the weaker the community of practice.

The third point draws on the influence of the four variables referring to students' personal characteristics; university entry score, age, ranking, and gender. Except for gender, which after controlling for duration of studies has no influence on grades, the remaining variables are statistically significant with the expected sign. The influence of the entry exams score is positive and the largest in magnitude among the three. According to our specification the estimated effect, leaving out D7 as an outlier, justifies a maximum degree grade difference between the highest and the lowest entry scores of 0.25 units (0.58 otherwise). Age, specified in a way to capture the relevance of the number of attempts to subsequent performance, gives a premium of 0.14 units to students entering university in the first instance. Finally, students entering departments ranked high in their priorities receive also a premium of 0.09 units.

We come finally to the relevance of students' status which is the main focus of this study. The engagement of students in paid employment does not seem to give rise to differences in performance between working and non-working students; this applies for both methods of estimation, for the mean (OLS) and for the median (QR). The same holds true for parental schooling which gives an insignificant estimate at all conventional levels of significance. Finally, residence, specified in a way to capture the effect of differences in the private cost of studies gives a meager result but of opposite sign. Students living with their families while studying achieve grades of 0.03 units higher than students living in rented apartments. If the private cost of studies played some role the effect should be the other way round; students living away from family home should, due to higher cost, complete studies earlier and get accordingly higher grades. In short, none of the variables which take account of students' financial and social circumstances seems to play any role on the formation of grades.

5.2 A Further Examination on the relevance of status

One might think that the association between working status and GPA works out in an indirect way, namely through affecting students' duration of studies (in other words that endogeneity is present in the model). This is indeed a possibility deserving further investigation. It has to be noted, however, that the association of status with grades through the length of studies requires the confirmation of two assumptions. The first is that working students take longer time to complete studies. We tested this hypothesis using information from the sample of working students (303 observations, 35% of the sample). The test relies on the rationale that the time a student needs for the acquisition of his/her degree is associated to the time (year of study) at which she/he began to work. If indeed employment affects duration of studies, the expected relationship must be negative; the earlier a student begins to work the longer will be his/her time of completion. In this regard we estimated, by means of an ordered probit model, the association of a student's initial year of work with his/her probability to complete studies after 0, 1, 2, 3, and 4 years of delay after controlling for gender, entry score, rank, age and department of studies⁸; The focus variable here is '*year work commenced*'. Significantly, we allow also for differences in the hours of employment between working students specified in a binary way that is as part-time and full-time. This is achieved by including in the model the variable '*hours of employment*'. The sample of the working students is divided into 97 full-time (32%) and 206 (68%) part-time employees and as the results presented in Table 4 below indicate the variation is sufficient to pick up this effect.

Table 4: Ordered Probit estimation for the Duration of Studies.

Dependent Variable: DURATION	
Method: ML - Ordered Probit (Quadratic hill climbing)	
AGE	0.121 (0.353)
GENDER	-0.308 (0.019)
YEAR WORK COMMENCED	-0.0285 (0.6244)
ENTRY SCORE	-2.602 (0.3534)
RANK	0.072338 (0.6292)
HOURS OF EMPLOYMENT	0.446 (0.001)
D1	-0.336 (0.083)
D2	-0.227 (0.044)
D3	-0.475 (0.1289)
D4	-1.0642 (0.0066)
D5	-0.057425 (0.8159)
D6	-0.232 (0.481)
D7	-1.181 (0.228)
Pseudo R-squared	0.0534
(p-values in parentheses)	

The coefficient on the variable *year work commenced* is insignificant suggesting that the length of the working period is irrelevant to the duration of studies. Students that work for one or four years while studying have the same probability to complete studies after 0 or four years beyond the expected length of degrees. The variable *hours of employment*, on the other hand, is significantly associated with the duration of studies. Students involved in full-time employment (taking the value 1 in the dummy variable *hours of employment*) are more likely to remain longer at university than students working in part-time jobs (value zero in the dummy variable *hours of employment*). We shall see below whether this difference matters for grades.

The second hypothesis requires that working students achieve lower grades than non-working students. The truth is that we have already a negative answer in this regard. Results presented in Table 3 above suggest that the status of students is not related to grades. This finding, however, may be objected for two reasons; firstly, because it draws on estimation performed at mean and median-level grades. Such estimates cannot rule out the possibility that grades are asymmetrically distributed over the two groups of students. That is, working students may be systematically excluded from achieving relatively high or very high grades. For this purpose we employ a quantile regression framework, which allows estimating the marginal effect on grades across its distribution. Table 5 below reports the results of the Quantile Regression Model for the coefficient of status (note here that the response for the median (0.5) is the same as the one that appears in Table 3). In effect we are putting the coefficient of status under the microscope to examine how this variable is related to low and high grades (see also Figure 1).

Table 5 Quantile Regression estimates for the coefficient attached to Status

	Quantile	Coefficient	Std. Error	t-Statistic	Prob.
STATUS	0.1	0.009997	0.044206	0.226151	0.8211
	0.2	-0.00347	0.041579	-0.08347	0.9335
	0.3	0.000122	0.045532	0.002678	0.9979
	0.4	-0.00887	0.052085	-0.17027	0.8648
	0.5	-0.00676	0.053893	-0.12545	0.9002
	0.6	-0.02056	0.053563	-0.38386	0.7012
	0.7	-0.04082	0.053023	-0.76987	0.4416
	0.8	-0.00944	0.057458	-0.16424	0.8696
	0.9	-0.06922	0.077988	-0.88755	0.375

See the notes of Table 3.

These results suggest that the student's status does not affect grades at any point of the empirical distribution of the dependent variable; working students may achieve high or low grades in a similar way as non-working students may do (p -values remain insignificant at all quantiles).

Secondly, the estimated effects presented in Table 3 do not take into account the differences in the hours of employment among working students. Given the association of the hours of employment with the duration of studies (table 4), it is important to examine whether the hours of employment are associated also with grades. If it does,

then students involved in full-time jobs must achieve lower grades than students in part-time jobs. To further explore this, the initial model of degree grade determination is re-estimated only for the sub-sample of the working students (303 observations, divided again into 97 full-time and 206 part-time employees), while allowing, additionally, for the hours of employment and the year that work commenced (see Table 6).

Table 6. The determinants of grades of working students – Dependent Variable GPA.

	OLS
C	4.654757 (0.0157)
GENDER	0.079954 (0.2445)
DURATION	-0.52895 (0.000)
DURATION^2	0.071757 (0.0021)
RESIDENCE	-0.03696 (0.1615)
ENTRY SCORE	2.707833 (0.1491)
RANK	-0.13995 (0.0605)
AGE OF ENTRY	-0.13852 (0.0291)
HOURS OF EMPLOYMENT	-0.04087 (0.5609)
PARENTAL SCHOOLING	-0.01688 (0.5952)
YEAR WORK COMMENCED	0.034843 (0.2486)
D1	-0.12307 0.1808
D2	-0.27667 0.0806
D3	0.136044 0.4255
D4	0.381052 0.1138
D5	0.840132 0.00
D6	0.318515 0.0654
D7	2.516509 0.0002
Adjusted R-squared	0.504
F-statistic	19.056
Prob(F-statistic)	0.00

Note: White Heteroskedasticity-Consistent Standard Errors

The results suggest that, neither the hours of employment nor the length of the working period, are linked with students' grades; both estimates are statistically insignificant. Therefore, the longer duration of studies of students involved in full-time jobs recorded above (table 4) does not show on their grades. What is more remarkable,

however, in this model is that the estimated effects are similar to those of the entire sample (Table 3). The size of the coefficient on the duration of studies, for example, in the initial model implied that each additional year of staying at university is associated with a fall of GPA by 0.55 units while for the sub-sample of the working students the corresponding size is 0.53 units. As a matter of exercise we have estimated the same model for the sub-sample of the non-working students (564 observations). The coefficient on the duration of studies was -0.56 units for each additional year of staying at university (Results available upon request). These findings suggest that the effect of the duration of studies on grades is irrelevant to the status of students and works out in the same way for both working and non-working students.

With respect to grades, therefore, our findings suggest that to be working while studying does not imply that you are placed at a disadvantaged position with regard to your non-working peers. The inability of part-time working students to attend lectures and classes does not reduce their probability to complete studies at the expected length of degrees and achieve also competitive grades. Even students who are engaged in full-time jobs and stay at university longer than the rest of their peers may also achieve competitive grades. Surprising enough this conclusion might be it may have a simple explanation; in a system that is centered on textbooks, final exams, and private individual study, attendance at lectures may not play a decisive role on outcomes. Indeed, 234 or 77% of the working students reported that employment did not affect adversely the process of their studies.

6. Conclusions

This study has been concerned with the relationship between socioeconomic background and grade outcomes in the context of university studies in Greece. The focus was on the influence of the students' family background on academic performance after controlling for a number of individual and institutional characteristics. In this respect we examined the relevance of three variables: parental education, family residence, and students' status defined as working and non-working students. Family residence was specified in a way to capture the effect of differences in the private cost of studies. The empirical findings suggest that none of these variables discriminate against one or the other group of students; degree-grades do not demonstrate differences neither between working and non-working students nor between students of different educational background or between students inflicted by unequal cost of studies.

This study discussed also the association between the duration of studies and students' grades. To find out what lies behind this odd symptom is of paramount importance in order to take policy action. If, for example, students delay the acquisition of their degrees because they need to work alongside studying then the correct policy to apply is not to place time restrictions on the length of studies. Instead, we have to look for what can explain the fall of grades of students that prolong studies. The most likely reason for the low performance of working students might be their inability to attend lectures and classes. Thus changes in curriculum design and timetable issues should rank high in the list of an informed policy action. It is only under such an institutional framework that we can perceive long duration of studies as a society's price for social justice and equal opportunities for all. As it is, the system does not seem to be helpful to the working students.

If, instead, long duration of studies and the associated with it fall in grades are not related to students' involvement in work then both effects have to be placed on a different ground; their relationship must be seen largely as co-relational rather than as causal. The evidence provided in this study suggests that the time required by a student to complete studies is relevant only for the students engaged in full-time jobs. In our sample, these students represent 32% of the working students or 11% of the registered. For the rest of students however, that is non-working or working in part-time jobs, representing 89% of all registered students, time-to-degree is irrelevant to status. Finally, even for the sub-sample of full-time working students the duration of studies does not

show on their grades. The symptom of falling grades, therefore, although closely related to the prolonging of studies, does not seem to derive from it. Further research is required to reveal the factors that lie behind both these symptoms.

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Figure 1

Acknowledgements

We would like to thank two anonymous referees of this journal for helpful and constructive comments. We are grateful to the administration of the University of Macedonia for providing us permission to access to individual students' records on a limited basis. We also wish to thank the following members of the administrative secretariat for their assistance in recording the data analyzed in this article: Josephina Dimitrova, Stelios Haritakis, Eleftheria Kiale, Niki Kougoula, Zoi Manou, Fotis Sarigiannis, Maria Tsapakidou, Vicky Valani and Thomai Zia. We are also indebted to Christina Kotakou for excellent research assistantship and Vasilis Monastiriotis for his comments. The usual disclaimer applies.

Notes

¹ It is important to note, however, that the beneficiaries of the expansion were not in all cases students from poor background. The UK experience indicates that the higher education expansion has been unequally distributed across income groups in a way that students from richer households were the main beneficiaries. Thus, the gap in participation between children from rich and poor households was widened further in favour of the rich (Blanden & Machin, 2004).

² In the year 2006 the Ministry of Education (ME), reflecting public concerns about falling entry qualifications, introduced a new clause stating that candidates in order to be considered for a place in higher education should achieve in the entry examinations an average score of 10 (out 20) over all tested subjects. This entry constraint affected primarily the number of entrants in the Technological Institutes. Thus, in the entry examinations of 2008 the available places for the Technological Institutes were 43,310 but only 26,004 of the candidates managed to exceed the minimum required score. Unlike Technological Institutes, the number of university intakes increased from 14,200 in 1980 to 40,205 in the year 2000 and fell slightly to 39,210 in 2008.

³ There exists an extensive literature in Greece regarding the equality of opportunities in accessing higher education institutions. Several authors have suggested that candidates coming from families of more educated parents and of higher socioeconomic background concentrate higher probabilities of tertiary education entry (see for example, Chryssakis, 1991; Chryssakis & Soulis, 2001; Katsikas & Kavvadias, 1994; Kiridis, 1997). These findings, however, have been challenged by studies which rely on detailed (micro-) data, use directly economic variables instead of social proxies, and adopt a tighter methodological and analytic frame (see for example, Papas & Psacharopoulos, 1991; Patrinos, 1992; Psacharopoulos & Tassoulas 2004; Tsakloglou & Cholezas, 2005). As a matter of fact these studies provide evidence of opposite effects, namely that the higher the family income the lower the probability of university entrance.

⁴ According to the legislation enacted in 2007, students will drop out from universities if they fail to graduate after $2n$ years of studies, where n is the expected length of degrees and it is varying between disciplines from 4 to 6 years, or if they fail to pass a single course after 8 attempts. The drop-out rate for our sample is 7.4% after 8 years of studies (see Table 1).

⁵ In the UK for example, the recent expansion in the number of home students went in hand with a rising proportion of those living with their parents whilst studying. This might be associated with the widening participation agenda — universities and colleges were encouraged to increase the admission of students from underrepresented groups, mainly working class students — or/and with the political pressure in favour of encouraging students to stay at home in order to cut costs; the pressure was particularly strong after mid 1980s as state support started to decline (Blanden & Machin, 2004; Johnes & McNabb, 2004). On this account several studies have expressed concerns about the effects of staying at home on educational outcomes; staying at home may impede students from being integrated successfully into the social and academic life of the college community, thus increasing the probability of a drop out. The empirical evidence on this issue is contradictory (see for example, Johnes & McNabb, 2004; Johnes & Taylor, 1990; Smith & Naylor, (2001a) and (2001b). More recently Callender (2008) reports that living arrangements do not impact on students' grades.

⁶ It should be noted, however, that recent studies in the UK have raised concerns about the ability of the common measures of social class to account effectively for the differences in students' socioeconomic background. The large differences in student retention rates between individual colleges, even within groups of students with similar levels of deprivation, have been taken as indications that the traditional notion of social class provides an insufficient account of the differences in participation in higher education and in the likelihood of dropping out (Noble & Davies, 2009). This led to the quest of a new theoretic approach which draws on Bourdieu's notions of habitus and cultural capital in an attempt to address the question of why students belonging to the same socio-economic group demonstrate diverse attitudes towards learning and persistence (Ball et al, 2002; Longden, 2002; Reay, 1998).

⁷ The proportion of working students found in this survey is slightly higher than that reported by two other studies conducted at different places and in different times; they both converge on the conclusion that the proportion of working students is above 30% (Katsikas, 2009; Papadimitriou, 1991). Neither of these studies deals with the question of how students' employment impacts on their performance.

⁸ In a way this exercise can also be understood as a test for causality between employment and duration of studies. A positive coefficient might be taken as an indication that employment itself is an effect of long duration of studies rather than its cause. Students anticipating longer staying at the university due to old standing academic obligations may respond to their family pressure by seeking an employment rather than by precipitating the acquisition of degrees. Ideally for causality we should have the number of courses that a student passed successfully prior to his/her engagement in paid employment. Unfortunately we were unable to retrieve this information.