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# **The Relationship Between Higher Education and Labour**

## **Market in Greece: the Weakest Link?**

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### **Abstract**

The high level of graduate unemployment, even though it is acknowledged as one of the most distinctive characteristics of the Greek labour market, it has not attracted enough attention in the academic literature. This paper utilizes micro-data from the Labour Force Survey in order to investigate how the employment situation of young (aged 35 and below) graduates varies across fields of study. The findings suggest that graduates of disciplines that have high levels of private sector employment, such as Polytechnics and Computer Science, are in general better off in the Greek labour market. On the other hand, graduates of disciplines that are traditionally related to the needs of the public sector, such as Sociology and Humanities, face poor employment prospects. The findings of this study highlight the need for drastic reforms of the Higher Education system.

**Keywords: graduate unemployment, Greece, higher education, field of study, labour market**

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## **1 Introduction**

From the economic theory it can be inferred that in most developed countries exists an inverse relationship between education and unemployment. For example Filer et al. (1996) observe that:

“... the stability of employment increases as workers become more educated. This fact reflects higher fixed costs leading to a much lower rate of inflow into unemployment among more skilled workers” (p.321)

The fact that individuals with higher education experience low levels of unemployment is well established, by evidence, in many developed countries (OECD, 2000; ILO, 1996). In addition, a number of empirical studies (Nickel, 1979; Mincer, 1991; Woolbers, 2000) suggest that as the level of education increases, the probability of unemployment decreases.

However, even though further education is generally related to better performance in the labour market, there are cases where the supply has increased further to the demand. In such cases the labour market situation of graduates is affected. In the UK, for instance, graduate unemployment has increased over the last years (Moreau and Leathwood, 2006). Another example is Taiwan, where the average unemployment duration for college graduates has been higher than for individuals with lower levels of education (Ghuang, 1999).

In Greece, the high rate of graduate unemployment is one of the most unique features of its labour market. This general observation, which is contrary to the situation in most OECD countries (OECD, 2000), has been highlighted repeatedly in the

literature. For instance, the European Commission (2003) points out that graduate unemployment has been rising by 2% every year. Similarly the latest *OECD Jobs Strategy* (2006) suggests that the estimated change in the probability of unemployment as a result of training of education of prime-aged workers (i.e. 25-44), is one of the lowest among OECD countries. Moreover, there is evidence that the type of higher education (e.g. PhD, masters, undergraduate degree) someone holds neither affects the incidence of unemployment (Livanos, 2008a), nor the incidence of long-term unemployment (Livanos, 2007). Further to these, Livanos (2009b) examined the wage flexibility of various groups of workers and found that graduates are the most responsive group to a prospective rise in unemployment. Finally, Patrinos (1997) studied the phenomenon of overeducation in Greece and suggested that *“overeducation is a new phenomenon brought about by an oversupply of graduates... forced to take jobs in inappropriate fields”* However, even though there is wide body of literature indicating evidence of over-education and problems in the graduate labour market, some commentators (Magoula and Psacharopoulos, 1999) suggest that the fears of expansion of higher education in Greece are greatly exaggerated as the demand for higher education is expanding along with the supply. Nevertheless, the thesis of Magoula and Psacharopoulos (1997) refers to the aggregate level of education as it does not examine variations by field of study. Purpose of the present study is to assess whether the so-called expansion of higher education has occurred in a rational manner that reflects the needs of the labour market regarding specific disciplines or it has, in fact, created certain mismatches in the graduate labour market.

The issue of graduate employability shows considerable interest in the literature. In particular, there is a number of studies examining graduates' employment situation

across the various fields of study (see for example Smith et al., 2000; Boero et al., 2001). However, this important issue has not been examined in Greece before. This paper makes use of the Labour Force Survey (LFS) micro-data in order to explore how the incidence of unemployment and its duration varies across the different levels of education, as well as the academic area of study. Purpose of this paper is to highlight the “winners” and “losers” in the labour market. This information can be used from both policy makers and individuals while designing the educational system and making career choices respectively.

## **2. The political economy of higher education in Greece**

### *2.1 The trend towards higher education*

In Greece, both policy leaders and individuals have historically regarded higher education as crucial to country’s future and central to any socio-economic debate. In 2004, Costas Karamanlis in his first press conference as Greece’s prime minister suggested that ‘*education will lead to growth and more jobs for everybody*’<sup>2</sup>, whereas George Papandreou, in his first interview as the new leader of the socialist party declared that ‘*education will secure [competitiveness] for the Greek economy while education and investment in human capital and knowledge will be Greece’s main asset*’<sup>3</sup>. The focus of policy makers is also reflected on the fact that most of the recent reforms of the Greek higher educational system were oriented towards an increase in the supply of education without taking into consideration whether the supply matches the demand. The Center of Planning and Economic Research (KEPE 2003) questions the aim of many recent changes in the educational system and suggests that there has been a tendency towards the provision of more education without scanning the needs

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<sup>2</sup> These, were the prime minister’s first statements in Zapion Megaron, 7/3/2004

<sup>3</sup> NET Radio 8/1/2004

of the society and economy<sup>4</sup> (p66). In fact according to data published by the Ministry of Education, the number of academic departments between 1993 and 2002 has increased by 40% and the number of students entering higher education has increased by 115% during the same period (Liagouras et al., 2003).

On the other hand, the Greek population shares this attitude towards higher education and encourages young individuals to continue into further education, either in Greece or abroad. George Psacharopoulos (2003a) in his book 'Greek education: a modern tragedy' points out that Greece has the highest ratio of students studying abroad in the world. Moreover, Greeks traditionally focus on disciplines that are considered to be prestigious, such as medicine and law. As the result, the numbers of such professionals have increased significantly. For instance, regarding physicians a recent study by OECD (2006) suggests that '*there are more physicians per capita in Greece than any other country*' (p.2). Similar to the case of physicians is the situation for dentists and lawyers (Katsanevas, 2004).

The focus of individuals and their families towards higher education has been addressed by many researchers across different disciplines (Nassiakou, 1981; Tsoukalas, 1981; Psacharopoulos and Soumelis, 1979). Its main cause has been suggested to be the 'unrealistic' expectations about the return on investment in higher education that has been created among young individuals and their families (Lambropoulos and Psacharopoulos, 1992). However, it is well documented (Lambropoulos and Psacharopoulos, 1992; Kanellopoulos, 1997; Tsakoglou and

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<sup>4</sup> For the developments in the Greek educational system see Kanellopoulos (1996)

Cholezas, 2001) that the returns to higher education have diminished over the last few decades.

The strong demand for higher education in Greece has been suggested also to be due to its direct low price (Lambropoulos and Psacharopoulos, 1992). As Psacharopoulos suggests (2003b), the problem of oversupply of graduates is mainly caused by the fact that the direct costs of education are zero (since higher education in Greece is free), so individuals choose their studies according to their social status and not necessarily their employment prospects. In addition, university students do not face the fear of dropping out due to poor performance, since they can remain students as many years as they wish. Thus, individuals might choose to study law or medicine, as such qualifications are considered to be prestigious, even though they might know that their future employment prospects might be poor.

Finally, individuals have historically seen a university degree as a passport to enter the public sector, which is traditionally preferred to the private, as it offers higher wages, better working conditions, and better pension schemes. During the 1980s the public sector expanded rapidly acting as a “safety net” against unemployment. However, in the beginning of 1990s its expansion ceased and the public sector is actually trying to reduce its numbers. Demekas and Kontolemis (1996) note that its expansion during the 1980s raised workers’ effective reservation wages (as wages were higher in the public sector than the private), which led directly to a rise in unemployment.

## 2.2 *The role of the Greek higher education system*

*“It is a fact that ... in many cases the [public] higher educational institutes [in Greece] produce unemployed graduates”<sup>5</sup>*

(Statement in the Greek prime minister’s speech in the Greek parliament, on the 24<sup>th</sup> of November 2006, about the Greek higher educational system)

It has been suggested that one of the main reasons accounting for the high levels of unemployment among graduates is the weak link between the higher education system and the labour market. The lack of sensitivity of the educational system to the needs of the labour market is highlighted by the European Commission (EC) almost every time it examines the Greek labour market. In one of the latest reports EC suggests that Greek education systematically insists on not taking into account the needs of the labour market, and keeps producing ‘people that hold qualifications that are not relevant to the needs of the labour market, thereby contributing to a consistent high level of unemployment (European Commission, 2003; see also European Commission 1996).

KEPE (2003), in trying to assess the reasons that account for the high levels of graduate unemployment, suggests that the problem lies mainly in the orientation of the education system towards the public sector. In essence, the educational system prepares employees for public sector jobs, such as teachers, public bank clerks, public administrators etc. However, the public sector is actually shrinking, since it is trying to reduce its staffing levels and especially those in public administration. As a consequence, the supply of such graduates has increased outpacing the demand, resulting in high levels of unemployment and underemployment (KEPE, 2003).

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<sup>5</sup> Minutes of the Greek parliament, ΙΑ΄, Γ΄, Λ΄, Friday 24<sup>th</sup> November 2006.

From the above literature review three key questions emerge, which will be explored empirically in this paper. These questions are set as follows:

- Has the apparent oversupply of graduates affected their employment situation in the labour market?
- Do graduates of “public sector disciplines” face problems in the labour market, expressed as lower chances of employment, than graduates of “private sector disciplines”?
- Are the fears of an oversupply of graduates of specific disciplines exaggerated?

### **3. Data used**

The analysis draws on micro data<sup>6</sup> from the Labour Force Survey (LFS), for the second (spring) quarter of the years 2000-2004<sup>7</sup>. The LFS is conducted by the National Statistical Service of Greece (ESYE). Since 1998, the LFS is conducted four times per year in order to meet the standards set by Eurostat. The sample of the survey is approximately 30,000 households and 80,000 individuals. The questionnaire used is comprised of approximately 100 questions and both the questions and the definitions used are based on the European LFS (see European Communities 2003).

Employed are considered those individuals that during the reference week worked at least one hour. On the other hand, unemployed are those who during the same period did not had a job but were eligible and were actively seeking for employment. For the purposes of the empirical analysis only data on individuals aged between 15 and 35

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<sup>6</sup> The micro-data from the Greek Labour Force Survey have only recently been made available to researchers. This study benefits greatly from this development as it allows examination of a relatively under-researched area.

<sup>7</sup> At the time of the study, 2004 was the most recent available wave of the Greek LFS. The use of more recent waves might alter the magnitude of the coefficients but would not affect the overall conclusions.

are used. This choice is made on the grounds that such individuals have recently graduated and thus their labour market situation is of more interest than older cohorts, who graduated some decades ago. Also in a policy perspective the position of relatively new entrants to the labour market can be better guide to how higher education needs to be reformed.

Regarding tertiary education in Greece, it is divided into **University Education**, which is provided by the Universities (AEIs), and **Higher Technological Education**, which is provided by the Technological Educational Institutes (TEIs). The University Education system includes the Universities, the Polytechnics, the Higher Fine Arts Institute and the Hellenic Open University. There are 20 universities in Greece located in various towns. AEIs consist of Faculties, which in turn are subdivided into Departments and individual Units. Regarding Technological Educational Institutes there are 14 TEIs, which composed of at least two Faculties; each Faculty comprises two or more Departments. The main distinctions between AEIs and TEIs are that TEIs courses last shorter than AEIs, are more practically oriented (than AEIs), and the entry requirements are in general lower.

#### **4. Evidence from the descriptive statistics**

##### **4.1 Education and unemployment**

Table I reports the levels of unemployment across the various levels of education for 2004 for the full sample. The rate of unemployment among graduates was in fact quite high (7.6%). Indicative of this is the fact that the unemployment rate for graduates of TEIs was the same (8.4%) as for individuals with primary education only. Moreover, employment for masters' holders was 7.4%. Nevertheless, when the

LFS sample is broken down into two age groups, 15-34 and 35-64, it is found that a negative relationship between education and unemployment seems to exist for the latter group (older group), but not for the former (from Figure I)<sup>8</sup>. This serves to suggest that graduate unemployment is a phenomenon mostly concentrated upon younger individuals, while the levels of older ones are considerably lower. This highlights the increasing supply of higher education that is accumulated among young people, which in turn affects their employment situation. This observation rationalize the choice to investigate empirically this particular group (15-35).

[INSERT TABLE I HERE]

We now turn to an examination of the unemployment rates according to the field of study for the full sample. The classification of education used for this comparison is the one used by the ESYE. Table II present the findings of this comparison. Table II also presents the proportions of individuals that: a) are employed in the public sector, and b) are self-employed.

The level of unemployment varies greatly across the undergraduate course studied, and for some courses the level of unemployment is much higher than the average rate (across all individuals). To illustrate, the unemployment rate for individuals who hold a TEI degree in Agricultural Studies was 23%. Other disciplines whose graduates experienced high rates of unemployment were; Sociology (14%), Librarianship (12%), AEI Agricultural Studies (12%), Humanities (10%), Sports (10%) and Applied Arts (10%).

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<sup>8</sup> The fact that for the former group the rate of unemployment for PhDs is about 14% while the overall rate is about 3.5% can be explained by the relatively low proportion of young people who hold a PhD degree.

Nonetheless, for some subjects the levels of unemployment were particularly low. Among those groups were Law, Medicine, and Computers Science, which experienced a rate of unemployment about 4%. The low levels of unemployment among individuals who have studied Medicine and Law contradicts the general feeling that Greece faces an oversupply of physicians and lawyers. However it should be noted that these professionals usually decide to become self-employed, hence the low levels of unemployment among them. In fact, as Table II illustrates graduates of disciplines that have high levels of self-employment, such as Law, Medicine, and Polytechnics (both AEI and TEI) face in general low levels of unemployment. Thus it can be argued that in the case of such professions self-employment may be seen as a safety net against unemployment or perhaps that demand is increasing along with the supply.

Another observation that can be made from Table II is that courses whose graduates have a high share of public sector employment (e.g. Sociology, Humanities) experience the highest levels of unemployment. On the other hand, the levels of unemployment for those who have attended courses related to the private sector, such as Computers Science and Engineering are generally low.

[INSERT TABLE II HERE]

[INSERT FIGURE 1 HERE]

## 4.2 Distribution across disciplines and wage levels

Table III illustrates the distribution of the population across the different levels and types of education over the period 2000-2004, as well as the dispersion of real graduate earnings over the various academic disciplines. Earnings are calculated as the net monthly wage that the respondents receive from their main employment inclusive of any extraneous payments (such as Christmas and Easter bonus, annual leave remuneration and other irregular bonuses). It is clear from Table III is that approximately 22% of the whole sample is comprised of university graduates, and that their mean wage (€1,040) significantly exceeds that of the entire population of employees (€872). In addition, there are marked variations in the subject of degree from which graduates have matriculated, with Economics and Business (15%), Humanities (15%) and Education (14%) occupying the lion's share of degrees. These are followed by the fields of Polytechnics (9%), Physics and Mathematics (9%), and Medicine (6%) or Medical-related sciences (7%). One can also observe a strikingly low proportion of graduates from Computing Science (0.8%), which is indicative of the lagging progress of Greece in keeping pace with the rapid speed of this era. Differences in the average level of pay by field of study are also observed, with mean monthly earnings being highest for Medical degrees (€1,272), followed by Law (€1,113) and Polytechnic (€1,122) degrees. A notable feature of the data is the lower average earnings of graduates from the TEIs compared to those from AEIs.

From the above one can draw the conclusion that fears regarding the saturated job market prospects of the fields of Medicine and Law, following an “overflow” of physicians and lawyers in the Greek labour market, have not materialized in terms of lower overall wage returns or high levels of unemployment.

[INSERT TABLE III HERE]

Nevertheless, by observing the figures in Tables II and III, it can be noted that disciplines whose proportion in the population of graduates is particularly high, such as Humanities, Economics &

Business, and Sports, and their proportion of self-employment is relatively low, face high levels of unemployment. This, on the one hand supports the fears of an oversupply of graduates that might not be able to keep pace with the demand resulting in high levels of unemployment among those graduates, while on the other hand highlights the structures of the Greek economy in which self-employment is central and often provides a “safety net” against unemployment.

Table IV shows the distribution of the population of graduates by status of economic activity and field of study between 2000 and 2004. It is interesting to note that during this period, which has been a phase of intense economic growth, the numbers of graduates in the economically active population have been increased by 22%. However, when the growth is broken down by field of study it is highlighted that it has been rather intense for fields that have high levels of unemployment, such as Sociology, Humanities, Sports, Agriculture (TEI) and Librarianship (TEI). This illustrates the malfunction of the Greek Higher Education system along with individuals’ irrational choices regarding fields of study as, for example, the increase of the numbers of graduates in Sociology (44% increase between 2000 and 2004) does not reflect the real needs of the labour market but instead leads to high levels of unemployment among them.

[INSERT TABLE IV HERE]

### **4.3 Education and time spent in unemployment**

The field of study also affects the time that an individual spends in unemployment while looking for a job. Figure 2 illustrates the disciplines that experienced the longest time in unemployment. Graduates of most of these disciplines spent more time looking for a job than did the average of the entire workforce (from Figure 2). For example, whereas in 2004 the average time spent in unemployment (across all levels of education) was 20 months, there were some disciplines, such as Librarianship, Applied Arts, Sports, Humanities and Sociology, for which it was

much higher (35, 29, 25,24 and 23 months respectively). In general, Figure II highlights that graduates of some specific disciplines and mainly those that are employed in the public sector (i.e. Humanities and Sociology) have to remain a long period in unemployment until they find a job. In most cases the average waiting time was longer for new entrants in the labour market.

[INSERT FIGURE 2 HERE]

## **5. Econometric analysis and results**

### **5.1 Level of education, field of study and the employment situation in the labour market**

This section assesses the employment situation of young graduates using a logistic regression technique. The outcome measure (dependent variable) in this analysis is the employment situation (employed or unemployed) of an individual. Two separate sets of regressions are estimated. In the first model, the focus is on how the different levels of education affect that incidence of employment, while the second focuses on the field of study, and the sample is restricted to AEI and TEI graduates only (excluding thus all post-graduates). Other control variables include; year of the survey region, marital status, gender, age-bands and whether the individual is the head of the household.

The results of the first and second model are shown in Tables V and VI respectively. The results are presented in the form of odds ratios. An odds ratio above 1.0 means that the odds of being unemployed for a given category are greater than for the reference category and similarly an odds ratio below 1.0 means that the odds of being unemployed for a given category are less than the reference category. The closer the

odds ratio is to 1.0, the more independent is the dependent variable of the explanatory variables.

[INSERT TABLE V HERE]

[INSERT TABLE VI HERE]

The results shown in Table V suggest that a statistically significant relationship between the level of education and the labour market situation has not been found to exist. In other words, the results illustrate that whether someone (aged between 15-35) has a PhD or a vocational qualification does not alter the chances of employment (relative to unemployment). This result, which corresponds to findings of previous research (Livanos 2009a), highlights a paradox of the Greek labour market as contrary to findings in many other countries there is no negative relationship between the level of education and chances of unemployment.

The discussion now turns to the results of the analysis on graduates of different disciplines as presented on Table VI. Reference category has been set the discipline Physics and Mathematics as it is a large category with average levels of unemployment. Various interesting results emerge from this analysis. Lowest are the chances of employment for graduates of Sociology, Humanities, and Agricultural Studies. This does not come as a surprise as these disciplines do not have much practical importance for the rising service sector of the Greek economy whereas the public sector in Greece, which has traditionally been the major employer of graduates of Humanities and Sociology, is trying to reduce the number of its employees.

On the other hand, the probabilities of employment are higher for graduates who are more attractive to the private sector, such as Polytechnics and Computer Sciences. Similarly, positive are the employment prospects for graduates of Law and Medicine. This finding contradicts the general feeling that the supply of such graduates has outpaced the demand affecting their situation in the labour market.

Turning to TEI courses, it is found that graduates of most such courses have higher probabilities of employment than graduates of Agricultural Studies. This can be explained by the trends of the Greek labour market as the agricultural sector, which for many decades used to be the core of economic activity in Greece has been contracting while at the same time the number of graduates of such courses has been increasing fast. On the contrary, graduates of disciplines whose qualifications are more closely related to the private sector, such as Food Technologists and Technologists, are found to have good chances of employment.

### **5.3 Level of education, field of study and time spent in unemployment**

This section assesses the relationship between the time that a graduate spends looking for a job and the level of his /her education, and the course attended. The response variable, time for looking for job, is an ordinal variable, which levels have a natural ordering (short to long time). An ordered logit regression model was constructed for this purpose. An ordered logit model can be seen as the natural extension of the binary logit to ordered responses. Similarly to the analysis on the employment situation, two models have been estimated. One on the full sample (of young individuals), and one on young individuals whose highest qualification was an university degree. Control

variables include: region, marital status, gender, age-bands, and whether the individual is HH.

The results of the two estimated models are presented in Tables VII and VIII respectively. One unit increase in the predictor variable is expected to change the level of the response variable (time looking for a job) by its respective regression coefficient in the ordered log-odds scale, given the other variables in the model held constant.

Table VII examines the relationship between the dependent variable and the various levels of education. The results suggest that individuals with post-graduate qualifications (*PhD, Masters*) have higher probabilities of looking for a job longer than AEI graduates. In other words, the analysis suggests that AEI graduates are less likely to spend longer time looking for a job than individuals with post-graduate degrees. This finding contradicts the overall evidence of other studies which (e.g. OECD, 2006) suggest that the time spend looking for a job decreases as the level of education of an individual increases. This finding is a signal of overeducation in the Greek labour market as higher qualifications, such as post-graduates degrees, are not rewarded in terms of time spent in unemployment. Regarding the rest levels of qualifications no statistically relationships were found, and thus no safe conclusions can be made.

[INSERT TABLE VII HERE]

Table VIII examines the relationship between the dependent variable (time looking for a job), and the course attended. The results reveal a similar picture as in the analysis on the employment situation. For example the chances of waiting in unemployment long are quite low for disciplines that relate to the needs of the private sector, such as Law, Economics, Computer Sciences. On the other hand, worse is the situation for graduates of Sports, Pedagogics, Humanities and Sociology.

[INSERT TABLE VIII HERE]

## **6 Discussion**

This paper used LFS micro-data in order to explore the labour market of young graduates (aged 15-35) in Greece. Starting with the employment situation by level of education, no statistically significant relationship was found to exist. In other words, the level of education does not appear to have an impact on the chances of employment. This is a signal of overeducation since in similar studies for other countries it is well-documented that the chances of unemployment decrease while the level of education increases. Similarly, regarding level of education and time spent in unemployment it was found that individuals with post-graduate studies have to wait longer in unemployment than AEI graduates, while the situation was found to be worse for PhD students. This finding serves to suggest that the labour market of post-graduate holders is rather competitive. Regarding PhD graduates it should be noted that most PhD jobs are public sector posts. In other words, there are not many PhD jobs, either academic or research while there is a plethora of PhD holders in the Greek labour market. On the other hand, individuals who just hold a university degree may be more employable as their skills are often more applicable in the labour market that

those of PhD and masters holders which might be considered to be more abstract. Moreover, post-graduates might be considered as over-qualified by the employers, and thus preference might be shown to individuals with an undergraduate degree only. However, the above finding might also serve to suggest that such graduates (PhD and Masters) are supported financially by their families and may decide to remain unemployed until they find an employment of their preference. Nevertheless, the situation described above is another indication of the problem that individuals with high qualifications face in Greece leading to the conclusion that in fact the oversupply of graduates has affected their labour market situation as it does not seem to match to the demand.

Moreover the evidence of this study suggests that both the employment situation of graduates as well as the time spent in unemployment are affected by their field of study. Table IX rates the employability of AEI and TEI graduates, based on the econometric analysis of the logistic regression (column 1), and the ordered logistic regression (column 2). Looking at Table IX we can group the fields of study into four main categories. The first category consists of disciplines whose graduates have both high chances of employment and low chances of remaining in unemployment for a long time. In other words, they seem to be better off in the labour market. Such disciplines are mainly those that have high levels of private sector employment, such as Economics and Business, Computers Science, and Polytechnics (from both AEI and TEI). The second group consists of disciplines that have high chances of employment; however once they are unemployed they will have to stay long until they enter the world of work. Such disciplines are Pedagogics. The third group is comprised by disciplines that have both low chances of employment and high chances

of waiting in unemployment long. Such are Humanities, Sociology, and Agricultural Studies (both AEI and TEI). The fact that graduates of groups two and three have high chances of waiting in unemployment long might serve as an indication that there is a skill mismatch for these in the Greek labour market. In other words, their unemployment is not a “frictional” phenomenon but has a rather “structural” character. Another explanation could be that the skills that these graduates acquire during their studies are very specific, and do not make them employable to a wide range of jobs. Finally the fourth group consists of disciplines whose graduates may have high chances of unemployment; however, they do not stay for long in unemployment. These disciplines are: Physics and Mathematics, and Librarianships. This may have various explanations. First of all, it might indicate that the incidence of unemployment for such disciplines has a frictional nature and thus such graduates will not have to look for a job for long. On the other hand, it might suggest that such graduates, being discouraged by the high levels of unemployment that their disciplines experiences, may decide to take up any job that might not match with the area of their study. However, it might also suggest that such graduates have broad skills that make them employable to a wider area of jobs.

[INSERT TABLE IX HERE]

The findings of this paper raise questions as to whether the demand for graduates of specific fields can keep pace with the supply. In particular, the overall findings of this paper support a wider notion that the Greek higher education system is oriented towards the needs of the public sector (i.e. Sociology, Humanities) and keeps producing such graduates, whose level of private sector employment is generally low.

Similar is the situation with graduates of courses, such as Agricultural Studies, which are not linked to the trends of the economy as agriculture in Greece is experiencing a dramatic decline. As a result, the chances of unemployment for those graduates are generally high, which fact in many instances leads them to accept jobs that are not representative of their qualifications. At the same time, graduates of disciplines that correspond to the needs of the labour market, such as Computer Sciences and Polytechnics, enjoy good employment prospects in the labour market. However, the role of individuals is also important as their decision to follow higher education, in Greece or abroad, has increased the level of supply, which has outpaced the demand. Nevertheless, fears regarding the saturated job market prospects of the fields of Medicine and Law, following an “overflow” of physicians and lawyers in the Greek labour market, have not materialized in terms of lower employment chances. Moreover, a first investigation of wage data similarly suggested that such graduates receive high compensation in the labour market. The above findings can rationalize the preference that individuals in Greece show towards these disciplines.

The overall findings of this study confirm the analysis of Glytsos (1990), who some 20 years ago foresaw that “*in the future, the overstuffed, ill-manned and overspend public sector in Greece cannot normally be expected to absorb large numbers as it did in the past*”. Yet, two decades since then there is still a need for educational reforms aiming to offer university courses oriented more towards the needs of the labour market and particularly the private sector, and less towards the public sector. This needs systematic scanning of the needs of the labour market (Livanos 2008), which is something that Greece contrary to most European Countries is lacking. Such labour market information could provide guidance to both policy makers and individuals while designing the educational system and making career choices

respectively. Also, requiring from the students to contribute towards the cost of their education could lead to more rational choices about the choice of field of study. The initiation of fees, which could be facilitated by the introduction of income-contingent loan schemes, might better align private and social rates of returns. Moreover, the inclusion of general skills in the curriculum of sciences might increase the levels of graduates employability, which might offer them some temporary employment until they find a job that matches their qualification. Such reforms will possibly improve the employability of graduates and might cease the “production of unemployed graduates”. Finally, individuals should receive the signals of the labour market situation of the various disciplines and make sound choices about their career prospects.

Over the last few years, governments in Greece have been discussing various possibilities of reforming the Higher Education system, and various recommendations have been made, such as the introduction of fees. Nevertheless, such measures entail a large political cost which often the governments are reluctant to bear. However, these developments have created a dynamic environment indicating that significant changes might be implemented in the forthcoming decade.

Further research could explore how the incidence of overeducation varies by field of study. This would throw further light to the employment situation of graduates and assess how the area of study affects whether someone’s employment is in the same field as his/her studies. Moreover, the estimation of the financial returns to education by field of study would provide insights as to why some students appear to behave in an irrational manner by studying fields with high unemployment.

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**Table I Unemployment rates (%), by level of education, Greece, 2004**

PhD	3.5
Masters	7.4
AEI	7.6
TEI	8.4
Vocational Qualifications	14.1
Secondary Education	11.6
Primary Education	8.4
<b>Total</b>	<b>10.1</b>
Source: Processed LFS Data 2004 (2nd quarter)	

**Table II Levels of public sector employment, self-employment and unemployment course, Greece, 2004**

	<b>% Employed in the public sector</b>	<b>% Self-employed</b>	<b>Unemployment %</b>
<b>Post-graduates</b>			
PhD	74	17	3.5
Masters	40	21	7.4
<b>AEI</b>			
Polytechnic	27	37	6.9
Computers Science	46	11	4.1
Agricultural Studies	53	21	11.8
Physics and Mathematics	49	19	7.6
Medicine	43	47	3.9
Law	22	61	3.6
Economics and Business	33	20	8.6
Sociology	48	10	14
Humanities	57	12	10.3
Sports	62	13	9.9
Pedagogics	86	3	6.2
<b>TEI</b>			
Polytechnic	34	25	5.5
Agricultural Degrees	30	14	23.2
Food Technologists	30	16	5.5
Librarianship	38	12	12.4
Medical	65	10	7.7
Applied Arts	15	38	9.9
<b>Total</b>	<b>45</b>	<b>21</b>	<b>8.5</b>
<b>Labour market total</b>	<b>23</b>	<b>32</b>	<b>10.2</b>

Source: 2004 LFS data, 2nd quarter

**Table III Mean wage by level of education and field of study, Greece, 2000-2004**

	%	Wage Mean (€)
<b>All sample</b>		
PhD	0.41	1,427
Masters	0.65	1,223
AEI	18.6	1,060
TEI	3.9	949
Vocational Qualifications	12.42	995
Secondary Education	47.17	817
Primary Education	16.85	752
Total	100	872
<b>Univ. graduates</b>		
<b>AEI</b>		
Polytechnic	9.13	1,122
Computing Science	0.8	1,099
Agricultural Science	2.76	1,059
Physics and Maths	9.21	1,052
Medicine	6.13	1,272
Law	3.71	1,113
Economics & Business	15.37	1,076
Sociology	1.72	1,029
Humanities	15.38	974
Physical Education	3.98	924
Sports	14.46	1,041
<b>TEI</b>		
Polytechnic	7.71	1,011
Agricultural Science	1.17	852
Food Technology	0.45	888
Librarianship	0.2	840
Medical-related	7.38	911
Applied Arts	0.44	865
<b>Total</b>	<b>100%</b>	<b>1,040</b>

Source: Processed LFS data 2000-2004, 2nd quarter

**Table IV Distribution of population by status of economic activity and field of study, Greece, 2000-2004**

	2000				2004				2000-2004 change	
	Active		Inactive		Active		Inactive		Active	Inactive
<b>AEI</b>	Level	%	Level	%	Level	%	Level	%	%	%
Polytechnics	91,613	12.2	12,360	0.08	107,137	11.8	13,916	6.7	16.9	12.6
Computers Science	3,314	0.4	261	0.00	9,981	1.1	818	0.4	201.2	213.2
Agricultural Studies	19,355	2.6	3,193	0.02	23,331	2.6	4,829	2.3	20.5	51.2
Physics Mathematics	64,314	8.6	8,704	0.05	68,165	7.5	12,054	5.8	6.0	38.5
Medicine	66,964	8.9	13,001	0.08	84,040	9.2	18,380	8.9	25.5	41.4
Law	51,327	6.9	15,362	0.09	57,016	6.3	17,158	8.3	11.1	11.7
Economics	118,381	15.8	28,245	0.17	137,217	15.1	37,849	18.3	15.9	34.0
Sociology	11,088	1.5	4,130	0.03	15,933	1.7	6,438	3.1	43.7	55.9
Humanities	100,987	13.5	23,226	0.14	122,272	13.4	33,430	16.1	21.1	43.9
Sports	25,598	3.4	2,779	0.02	35,413	3.9	3,166	1.5	38.3	13.9
Education	83,031	11.1	37,751	0.23	92,535	10.2	40,509	19.6	11.4	7.3
<b>TEI</b>										
Polytechnics TEI	52,745	7.0	5,943	0.04	70,515	7.7	8,069	3.9	33.7	35.8
Agriculture	9,031	1.2	1,326	0.01	15,650	1.7	792	0.4	73.3	-40.2
Food technologists	2,328	0.3	964	0.01	4,449	0.5	643	0.3	91.1	-33.3
Librarianship	871	0.1	228	0.00	2,763	0.3	340	0.2	217.2	49.1
Medical TEI	44,449	5.9	4,093	0.03	58,664	6.4	7,012	3.4	32.0	71.3
Applied arts	3,651	0.5	583	0.00	5,875	0.6	1,718	0.8	60.9	195.0
<b>Total</b>	<b>749,045</b>	<b>100.0</b>	<b>162,148</b>	<b>1.00</b>	<b>910,957</b>	<b>100.0</b>	<b>207,121</b>	<b>100.0</b>	<b>21.6</b>	<b>27.7</b>

Source: Processed LFS data 2000,2004, 2nd quarter

**Table V The incidence of employment by level of education among young people (15-35), Logit Regression Results (Greece, 2000-2004, LFS data, 2nd quarter)**

	<b>Coefficients</b>	<b>Standard Error</b>
PhD	0.82	0.312
Masters	1.04	0.197
AEI	§	
TEI	1.29	0.413
Vocational	0.90	0.181
Other	1.09	0.146
Secondary	1.26	0.191
Primary	4.76 (***)	1.08

§ Indicates the omitted dummy variable, \*\*\* Statistically significant at the 1% level

\* Statistically significant at the 10% level, Log likelihood = -2882, Prob > chi2=0,000, Pseudo R2 = 0.068, No. of obs.: 44,716. controls include: year of the survey, region of residence, marital status, gender, age-bands, and whether the individual is responsible of the household

**Table VI The incidence of employment by field of study among young graduates (15-35), Logit Regression Results (Greece, 2000-2004 LFS data, 2nd quarter)**

	<b>Odds Ratio</b>
<b><u>Graduates (AEI)</u></b>	
Polytechnic	1.584 (***)
Computers Science	1.199 (**)
Agricultural Sciences	0.853 (*)
Physics and Mathematics	§
Medicine	1.106 (***)
Law	3.68 (**)
Economics and Business	1.169 (*)
Sociology	0.582 (**)
Humanities	0.783 (**)
Sports	1.062 (**)
Pedagogics	1.129 (**)
<b><u>Graduates (TEI)</u></b>	
Technologists	1.351 (***)
Agricultural degrees	0.705 (*)
Food Technologists	2.826 (**)
Librarianships	0.899 (**)
Medical studies	1.099 (***)
Applied Arts	0.754 (*)

Omitted category = unemployed, § Indicates the omitted dummy variable, \*\*\* Statistically significant at the 1% level, No. of obs.: 7,315, Log likelihood = -2826, Prob > chi2 = 0,000, Pseudo R2 = 0.0715, controls include: year of the survey, region of residence, marital status, gender, age-bands, and whether the individual is responsible of the household.

**Table VII Time that young unemployed people (15-35) have been looking for job, Ordered Logit Results, (Greece, 2000-2004, LFS data, 2nd quarter)**

	<b>Coefficients</b>	<b>Standard Error</b>
PhD	0.411 (*)	0.42
Masters	0.108 (***)	0.216
AEI	§	
TEI	0.054 (*)	0.402
Vocational	-0.401	0.236
Other	0.280	0.144
Secondary	-0.171	0.187
Primary	-.440 (*)	0.317

§ Indicates the omitted dummy variable, \*\*\* Statistically significant at the 1% level, \*Statistically significant at the 10% level

Log likelihood = -19372.322, Prob > chi2=0,000, Pseudo R2 = 0.198 , No. of obs. :12,340. controls include: year of the survey, region, marital status, gender, age-bands, and whether the individual is responsible of the household

**Table VIII Time that young unemployed graduates (15-35) have been looking for job, Ordered Logit Results, (2000-2004, Greece, LFS data, 2nd quarter)**

	<b>Coefficient</b>
<b>Graduates (AEI)</b>	
Polytechnic	-0.555(**)
Computers Science	-0.734 (**)
Agricultural Sciences	-0.608 (*)
Physics and Mathematics	§
Medicine	-0.514(***)
Law	-0.825(*)
Economics and Business	-0.697 (***)
Sociology	-0.346(*)
Humanities	-0.154(***)
Sports	0.164(***)
Pedagogics	0.037 (*)
<b>Graduates (TEI)</b>	
Technologists	-0.749 (**)
Agricultural degrees	-0.459 (**)
Food Technologists	-0.968 (**)
Librarianships	-1.385 (***)
Medical studies	-0.372 (***)
Applied Arts	-0.429 (*)

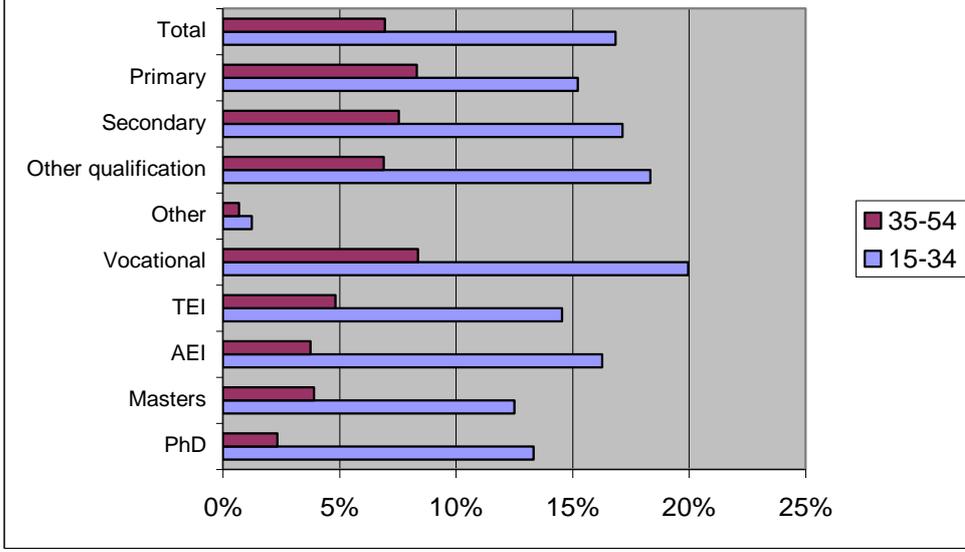
Omitted category = unemployed, § Indicates the omitted dummy variable, \*\*\* Statistically significant at the 1% level, No. of obs.: , Log likelihood = , Prob > chi2 = 0,000, Pseudo R2 = , controls include: year of the survey, region of residence, marital status, gender, age-bands, and whether the individual is responsible of the household.

**Table IX Rating of disciplines according to time looking for job and employment situation**

<b>Disciplines</b>	<b>Employment vs unemployment**</b>	<b>Time looking for job*</b>
<b>AEI</b>		
Law	1	1
Polytechnic	2	5
Computers Science	3	3
Pedagogics	4	10
Economics and Business	5	2
Medicine	6	6
Sports	7	11
Physics and Mathematics	8	9
Agricultural Sciences	9	4
Humanities	10	8
Sociology	11	7
<b>TEI</b>		
Food Technologists	1	2
Technologists	2	3
Medical studies	3	6
Librarianships	4	1
Applied Arts	5	5
Agricultural degrees	6	4

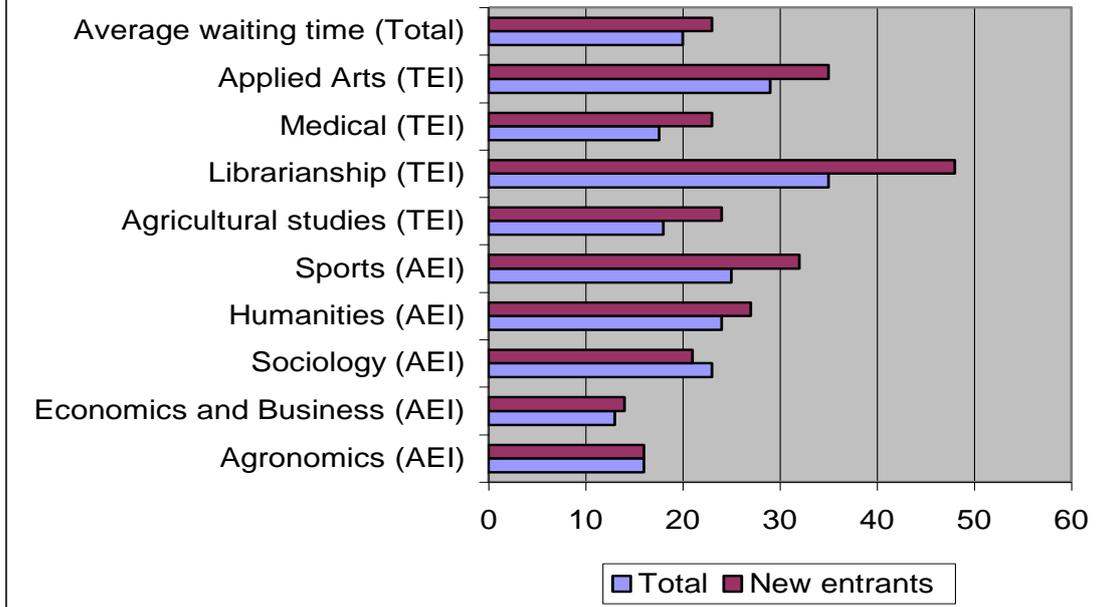
\* 1 = discipline with the lowest odds of looking longer for job comparing to the reference category, \*\* 1 = discipline with the highest of odds of being employed  
Compared to being unemployed

**Figure 1 Unemployment rates and age, 2004.**



Source: Processed LFS Data 2004 (2<sup>nd</sup> quarter)

**Figure 2 Average time (months) looking for a job**



Source: Processed LFS Data 2004 (2<sup>nd</sup> quarter)