

Tsakloglou, Panos; Cholezas, Ioannis

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## Education and Inequality in Greece

Panos Tsakloglou  
Ioannis Cholezas

May 2005

# Education and Inequality in Greece

**Panos Tsakloglou**

*Athens University of Economics and Business, IMOP  
and IZA Bonn*

**Ioannis Cholezas**

*Athens University of Economics and Business*

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IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0

Fax: +49-228-3894-180

Email: [iza@iza.org](mailto:iza@iza.org)

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## ABSTRACT

### Education and Inequality in Greece\*

In the public discourse, education is usually considered as the main vehicle for the promotion of social equality and social mobility. The paper surveys the existing literature and concludes that the relationship between education and inequality in Greece is strong. Inequities are evident at all levels of the education system; especially as regards access to the most rewarding level, that is, university education. Many facets of the inequities observed in the labour market are associated with education, while education appears to be the single most important factor that shapes the overall distribution of income and influences the probability of poverty. Nevertheless, so far, several links between education and inequality have not been examined in detail.

JEL Classification: I22, I28, J31

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Corresponding author:

Panos Tsakloglou  
Department of International and European Economic Studies  
Athens University of Economics and Business  
76 Patission Street  
Athens 10434  
Greece  
Email: [panos@aueb.gr](mailto:panos@aueb.gr)

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## **1. Introduction**

Contemporary macroeconomic theory stresses the importance of human capital for the achievement of high rates of economic growth (Lucas, 1988; Romer, 1990; Barro and Sala-i-Martin, 1995), while human capital theory suggests that the distribution of human capital across individuals is an important determinant of aggregate inequality through its effects on the distribution of earnings (Becker, 1964; Mincer, 1974). Indeed, the existing evidence in both developing and developed countries shows that better-educated workers enjoy higher wages, lower rates of unemployment and better career prospects (Psacharopoulos and Patrinos, 2004).

In the Greek public discourse, education is usually considered as the main vehicle for the promotion of social equality and social mobility. Taking into account the positive relationship between education and wages, many policy makers consider education as an efficient instrument for promoting growth and reducing inequality, especially through the improvement of the qualifications of the least educated segments of the population. Nevertheless, relatively limited empirical research has been carried out so far in Greece in comparison with most other European countries, by either economists or sociologists on the precise channels through which education influences inequality.

The present article examines in detail the existing empirical evidence on various aspects of the effects of education on economic inequality in Greece. The remaining of the article is structured as follows. The next section is devoted to the examination of inequities in the Greek education system. It consists of three sub-sections. The first provides an overview of the Greek education system, the second is devoted to the examination of inequalities in access to tertiary education – a topic that features prominently in the Greek public discourse – and the third to the examination of the distributional impact of public education transfers in-kind, a very important topic that was rather neglected until recently. Section 3 is devoted to the effects of education on labour market outcomes and also consists of three sub-sections. The first provides a brief overview of the Greek labour market, the second focuses on the relationship between education and unemployment, whereas the third surveys the existing evidence on the relationship between education and wage inequality. Section 4 examines the impact of education on aggregate income distribution, and consists of two sub-sections. The first analyses the links between education and aggregate inequality while the second is devoted to the examination of the association between education, poverty and social exclusion. Finally, Section 5 concludes the article.

## **2. Inequities in the Greek education system**

### **2.1 An overview of the Greek education system**

For a number of historical reasons, traditionally Greece had a relatively well-educated population in comparison with countries at her level of economic development. This can be attributed primarily to the fact that ever since the creation of the modern Greek state, in 1830, Greece had an overbloated bureaucracy. According to Tsoukalas (1977), the share of the civil servants in the population of the predominantly rural Greece in the late 19<sup>th</sup> century was substantially higher than the corresponding share in the leading industrial country of that period, the United Kingdom. A job in the civil service was highly considered and sought after, especially after a constitutional reform in the early 20<sup>th</sup> century that gave tenure to

civil servants. An essential requirement for admission in the civil service was high educational qualifications in comparison with the rest of the population. This, in turn, created a strong demand for education; a perennial feature of the Greek education system.

Until an important reform of the education system that took place in 1964 the years of compulsory education were six; i.e., only primary education was compulsory. After that reform they rose to nine, only to be reduced again to six during the period of the military dictatorship (1967-1974) (Gouvias, 1998a). Reforms that were implemented after the restoration of democracy in 1976 increased the years of compulsory education to nine – a limit that still applies today – thus, making primary as well as lower secondary education compulsory. At the same time, following the recommendations of international bodies such as the World Bank and the OECD for the support of vocational education and the need to reduce the substantial inequalities in educational opportunities that were prevailing in the 1970s (OECD, 1980), the first non-university tertiary education institutions were established (Technological Education Institutions). The changes in the education system that took place after the 1970s were not radical. Their main characteristics were, firstly, the gradual abolition of selection at the lower levels of the system and, secondly, the introduction and strengthening of new selective procedures at the end of the upper secondary education.

According to the Greek constitution, education is provided free of charge at all levels. Pre-primary education is not compulsory and the public supply of nursery schools is not able to fulfil the existing demand, which is covered by private sector providers. A number of private schools operate at the primary and the secondary level. Enrolments in private schools account for 5 to 10 per cent of all enrolments and the overwhelming majority of private schools students belong to households located at the top two quintiles of the income distribution (Antoninis and Tsakoglou, 2001). At the tertiary level, degrees offered by private institutions, which are treated by the law as commercial enterprises rather than educational institutions, are not officially recognised as equivalent to those of public institutions. The structure of the Greek education system in the mid-1990s is summarised in Table 1. In 1998, the various types of upper secondary education institutions were replaced by Lyceums and Technical Vocational Schools, lasting for three years. Lyceum graduates are eligible to take part in the general examinations to enter the Higher Education Institutions, which operate under a *numerus clausus* status. Graduates of Technical Vocational Schools may only enter Technological Education Institutions by participating in the general examinations. In 2004, the Ministry of Education announced that in the near future upper secondary education will be re-organised in such a way that all secondary education students will be able to participate in the general examinations to enter the Higher Education Institutions (Universities or Technological Education Institutions). Moreover, it was announced that qualifying examinations would be re-introduced in both primary and secondary education.

[Table 1 here]

The Greek education system – and, in particular, its secondary level – is supposed to provide general skills with particular emphasis on humanities. In this way it is not contributing intensively to the acquisition of practical or vocational skills. Several studies have pointed to the fact that, when compared to countries at her level of economic development, education has played a minimal role in spurring economic growth in Greece (Caramanis and Ioannides, 1980; Vaitzos and Giannitsis, 1993).

Upper secondary education is primarily viewed as a means to enter the tertiary level and bears little relation to the needs of the economy. On the other hand, the technical-vocational lyceums and schools offer reputedly lower quality of education. Links with firms are scarce and there is no formal way to absorb and channel graduates in the labour market.

Even though the education system expanded rapidly and enrolment rates have risen substantially in recent years, public expenditure on education did not rise accordingly and has, during the last decade, hovered between 3.5 and 4 per cent of GDP (OECD, 2002). This proportion is one of the lowest in OECD. Despite the limited number of students attending private schools, private expenditures on education are very high (for things such as foreign languages teaching and, especially, crammer schools for preparation for tertiary education examinations) and rising inter-temporally. Kanellopoulos et al. (2003) estimate that the share of education expenditures in household budgets rose from 2.15 per cent in 1974 to 4.41 per cent in 1999; a share substantially higher than that of almost every other European country. Taken together, public and private education spending accounts for approximately 6.5 per cent of GDP (Kanellopoulos and Psacharopoulos, 1997).

With substantial contributions from EU Structural Funds, the infrastructure of primary and secondary education improved considerably in recent years. Moreover, due to the rapid decline in fertility rates and despite the fact that, during the last fifteen years, there was a large influx of children of immigrants working in the Greek labour market in the first two levels of the Greek education system, the number of students attending primary schools declined rapidly. A similar but less pronounced decline in the number of students is observed in secondary education, in spite of the increased share of students attending the non-compulsory part of secondary education. Partly as a consequence of this decline, the pupil-teacher ratio declined rapidly and is nowadays lower than the OECD average (see the evidence reported by Brunello et al. in this volume).

In the 1950s and 1960s, large numbers of students dropped out before completing the compulsory levels (primary and lower secondary) of the education system. In the early 1980s, dropout rates from compulsory education had declined to around 20 per cent, and in the 1990s they were close to 10 per cent (Paleokrassas et al., 1997). This proportion was not substantially different from the EU average at that time. It is not unlikely that with the influx into the Greek education system of foreign students experiencing language and assimilation problems, these rates may have risen a little in recent years. Dropout rates from compulsory education are higher among males than females and, further, they are higher in the poorer rural areas of the country than in the cities (Paleokrassas et al., 1997). About half of these dropout rates concern persons who do not register into lower secondary education after the completion of primary education. Despite the decline in dropout rates, according to Kanellopoulos et al. (2003), in the late 1990s 12.2 per cent of all persons aged 15–19 had not completed the compulsory levels of the Greek education system, while the corresponding proportion for those aged 20–24 was 10.4 per cent.

Until recently, the appointment of primary and secondary education teachers in public schools was based upon a waiting list for education departments' graduates. The time between graduation and employment lasted for several years; a fact that most probably was affecting negatively the quality of teaching. Moreover, the salaries of public education teachers in Greece are primarily determined by seniority rather than performance. They are lower than those in most other OECD countries

(see Brunello et al. in this volume), but the ratio of these salaries to the average earnings appears to be higher in Greece than in most OECD countries. No study can be found in the literature examining the effect of teacher salaries on educational outcomes (it should be noted, though, that in the existing framework such a study would not present enormous interest from either a research or a policy point of view).

Regarding the outcome of the first two levels of the Greek education system, the evidence of international comparative projects like the OECD-PISA (Programme for International Student Assessment) does not seem very encouraging. The assessment of students aged 15 in OECD countries shows that the Greek scores were lower than the OECD average in all subjects tested: reading literacy (474), scientific literacy (461) and mathematical literacy (457), against the OECD average of 500 (see Brunello et al. in this volume). In addition, it should be noted that the education system is highly centralised with respect to what is being taught throughout the country. For example, the textbooks in use are the same for all schools (even for the private ones) designed by a special body, the Pedagogical Institute. Naturally, this has an effect on the pace of adaptation of the content of studies to the changing social conditions.

An overview of inequality in access to higher education is provided in the next subsection. Regarding primary and secondary education, in theory, the fact that these levels of education are characterised by a centralised structure should guarantee schooling of equal quality across regions and schools. However, the existing direct and indirect evidence suggests that this is far from true. Public schools in poorer areas are considerably less well equipped in terms of infrastructure than public schools located in more prosperous areas while, when exams were still in place in secondary education, there was clear evidence of a strong correlation between educational level of parents and success in the examinations (Katsikas and Kavadias, 1994).

## 2.2. Inequalities in access to tertiary education

As noted earlier, demand for tertiary education in Greece is very strong and is rationed using a centralised *numerus clausus* system. More specifically, every year the Ministry of Education decides about the number of places that will be allocated to each department of each higher education institution. On the basis of this quantity rationing, upper secondary education graduates fill the places, after participating in nationwide competitive entry examinations ('general examinations'). These examinations, normally held in June, receive high attention from the press and, as Psacharopoulos and Tassoulas (2004, p. 241) point out "it is not an exaggeration to say that the whole nation is mobilized around this event". It is generally agreed that this particular system of examinations has distorted the whole educational process, has gradually reduced the educational role of the Lyceum, encouraged memorisation instead of innovative thinking, and is quite inefficient in sorting out students according to their abilities.

Until the early 1990s, less than 20 per cent of the candidates entered Universities, while slightly less than 20 per cent entered Technological Education Institutes, mostly not of their choice. In recent years, the number of places offered has risen considerably, mostly in newly established Universities and, especially, Technological Education Institutes. As a result, the ratio of candidates to places offered has declined, although the demand for places in University faculties such as medicine

and engineering exceeds supply by a very wide margin. Even though it is generally recognised that some Technological Education Institutes offer skills that are highly valued in the labour market, the perception of the general public is that the courses offered by Technological Education Institutes are of inferior quality in comparison with the courses offered by the Universities and, hence, their educational status is usually considered as substantially lower (Benincasa, 1998).

The issue of unequal access to tertiary education has been studied by numerous researchers (see, among others, Meimaris and Nikolakopoulos (1978), Psacharopoulos and Papas (1987), Psacharopoulos (1988), Papas and Psacharopoulos (1991), Patrinos (1992, 1995) Katsikas and Kavadias (1994), Polydoridis (1995), Kyridis (1996), Kassotakis and Papagelli-Vouliouri (1996), Gouvias (1998a, 1998b), Chryssakis and Soulis (2001), Psacharopoulos and Tassoulas (2004), Psacharopoulos and Papakonstantinou (2005)). Even though most of these studies are descriptive in nature (for example, no study uses probability analysis in order to investigate in detail the factors that affect the success or failure of candidates in the general examinations), their conclusions are very similar: children of parents with better educational qualifications and occupational background are far more likely to succeed in tertiary education examinations than students from lower socio-economic strata. This phenomenon is far stronger in Universities than in Technological Education Institutes.

A vivid picture for the period 1984 to 1998 is provided by Chryssakis and Soulis (2001) and is reproduced in Table 2. This table reports the ratio of the proportion of first-year University students whose fathers belong to one of five particular occupational groups to the proportion of males aged 45–64 belonging to the corresponding occupational group (national average: 1.00). According to this index of unequal access to Universities (not tertiary education in general), children of blue-collar workers are slightly under-represented in the Greek Universities, while those of white-collar workers are around twice as likely as the national average to succeed in University entry examinations. The three remaining groups – children of farmers, unemployed persons and the residual category ‘other’ (mostly children of pensioners) – are substantially under-represented in Greek Universities. Similar evidence for more recent years is reported in Psacharopoulos and Papakonstantinou (2005). The differences are even more striking when the investigation is performed at the faculty level, with the children of better-educated white-collar workers even more heavily over-represented in fields like medicine, engineering and, to a lesser extent, business studies (Chryssakis and Soulis, 2001). Gouvias (1998a) also reports considerable disparities with respect to the educational qualifications of the parents of higher education students, although he also notes that they are not as large as the disparities observed with respect to their parents’ occupational status. Furthermore, according to Psacharopoulos and Tassoulas (2004), poor districts, evening schools, and state schools are associated with lower achievement in higher education entry examinations, whereas private schools are associated with higher achievement, even controlling for parental schooling and wealth (it should be noted, though, that the latter is questionable, since the data used by the authors are aggregate data rather than micro-data).

[Table 2 here]

What lies behind these differences? As noted above, private demand for higher education is strong. As a result of the parents’ keen interest in the success of their children in University entry examinations, a very large number of costly private

crammer schools assisting the candidates have sprouted, operating in parallel with the official education system but, in fact, substituting it in many respects. Psacharopoulos and Tassoulas (2004) estimate that private spending per secondary education student is equal to 1.44 times the amount spent by the state per secondary education student, and speculate that this figure is substantially higher if the sample is restricted to upper secondary education students. Indeed, most upper secondary education students attend such crammer schools; even those from poor households. However, private spending per student and, hence, the quality of private tuition obtained varies considerably according to the ability of the household to pay for such services.

The latter is evident in the figures of Antoninis and Tsakloglou (2001), which are reproduced in Table 3. In this table, individuals aged 15–17 are grouped into quintiles according to the equivalent income of their households. In theory, everybody has the same chances to succeed in tertiary education entry examinations. However, the reality is very different. For a start, participation in post-compulsory secondary education is positively related with the economic status of the student's household; the proportion of persons aged 15–17 who do not participate in the post-compulsory stages of secondary education is more than twelve times as high in the bottom than in the top quintile. Moreover, as the evidence of the next row of the table points out, although the evidence is not clear-cut, among the population members aged 15–17 who participate in secondary education, the proportion of those who attend technical rather than general education is higher among the poorer students. As a result, not only fewer students from poor households reach the starting line for tertiary education entry examinations, but even those who reach it are more likely to be blocked from participating in examinations for a place in a University. On top of this, the next row of the table suggests that the probability that an upper secondary education student attends a crammer school or receives private tuition is closely associated with the socio-economic status of his or her family. This probability is almost three times higher for such a student belonging to the top than to the bottom quintile. Further, it is not only the probability of attending a crammer school or receiving private tuition that is closely associated with the socio-economic status of the student's family, but also the actual amount of spending for services of this kind (see also Psacharopoulos and Papakonstantinou (2005)). The evidence of the fourth row of Table 3 shows that, on average, spending per upper secondary education student attending a crammer school or receiving private tuition is 3.7 times higher for students belonging to the top than to the bottom quintile. As a consequence, the ratio of tertiary education (University) students to upper secondary (general upper secondary) education students, reported in the last row of Table 3, is positively related to the quintile of the student's household (a reversal is observed in the top quintile; this should be attributed to the fact that a considerable proportion of the children of the households of the top quintile is likely to be found studying in foreign rather than Greek Universities). Under these circumstances, it is easy to understand why students from richer households are over-represented in tertiary education.

[Table 3 here]

The insufficient number of places in Greek higher education institutions and, until recently, the underdevelopment of post-graduate studies in Greece led a substantial number of Greek students to foreign Universities, thus perpetuating and strengthening a long tradition of high numbers of Greek students abroad. There is

no official record in Greece of the number of Greek students studying abroad. However, according to UNESCO (1997), in the early 1990s over 40,000 Greeks were studying abroad, while Eurostat (2001) estimates the number of Greek students in other EU countries alone in the late 1990s to around 50,000. Psacharopoulos and Tassoulas (2004) argue that the total number of Greek students abroad in the early 2000s should be approximately 70,000. If this estimate is correct, it means that almost 65 Greek students per 10,000 persons in the general population study abroad; a staggering figure for student emigration and definitely one of the highest in the world. In short, the idea of free education guaranteeing equal opportunities in access to tertiary education to everybody appears contestable in practice while, at the same time and taking into account the cost of studying abroad, all the available evidence suggests a relatively high willingness-to-pay for education services.

### 2.3. The distributional impact of public education

Despite the fact that one of the main mechanisms used by the state in order to redistribute resources among its citizens is the education system, until recently no detailed study could be found in the literature examining in detail the distributional impact of public education transfers in-kind in Greece. In recent years, two papers (Tsakloglou and Antoninis, 1999; Antoninis and Tsakloglou, 2001) used static incidence analysis in order to examine this impact in 1988 and 1994. Even though they tried several alternative reference populations – the entire population, households with heads aged 25–60, households with members aged 6–24, children in particular age brackets, etc. – the results were always similar in qualitative terms (although, naturally, in quantitative terms they were not). In a static framework, the overall distributional effect of the provision of free education services by the state was found to be progressive, but the extent of progressivity varied substantially across educational levels. More specifically, transfers to primary and secondary education students were found to reduce inequality substantially, while transfers to tertiary education students – and, especially, University students – were found to increase inequality. For example, Antoninis and Tsakloglou (2001), using the data of the 1993/94 Household Budget Survey, derive the estimates reported in Table 4.

[Table 4 here]

The index of inequality used in this table is the mean log deviation. Depending on the distribution used, public education transfers reduce inequality between 2.2 and 11.9 per cent. Almost all this progressivity is due to primary (1.9 to 6.9 per cent) and secondary (1.6 to 6.2 per cent) education transfers. Nevertheless, this may be an over-estimation since, due to lack of relevant information, the authors were not able to take into account the effects of dropout rates of children below the age of 14 which, as noted earlier, are likely to be higher among poorer students. Unlike transfers to students at the first two levels of the education system, transfers to tertiary education students increase inequality between 0.2 and 2.9 per cent, depending on the distribution used. In the latter case, almost the entire effect is due to transfers to University students, while the impact of transfers to Technological Education Institute students is negligible. In fact, the authors argue that in reality the distributional impact of tertiary education transfers is likely to be far more regressive. This is because due to lack of detailed information they used a uniform subsidy per University or Technological Education Institute student. However, there is evidence that students from wealthier households are over-represented in faculties

such as medicine and engineering where transfer/cost per student is substantially higher than the average whereas those from poorer households are concentrated mostly in low transfer/cost per student humanities and social sciences faculties (Meimaris and Nikolakopoulos, 1978; Frangoudaki, 1985; Chryssakis, 1991; Petychaki-Henze, 1992). Moreover, Antoninis and Tsakoglou (2001) report that the progressivity of public education transfers declined between 1988 and 1994 and almost the entire change is accounted by changes in the progressivity of tertiary education transfers.

### **3. Education and labour market inequalities**

#### **3.1. An overview of the Greek labour market**

The Greek labour market is characterised by a number of features, uncommon in the labour markets of most other European countries. Agricultural employment in Greece is approximately 15 per cent and is by far the highest in the 'old' EU-15 countries. The great majority of those engaged in agricultural activities are self-employed farmers. Self-employment is also widespread outside agriculture (almost a quarter of those working in industry and services are self-employed); especially in the low-skill segment of the labour force (domestic services, shopkeepers, small traders, etc.) and the high-skill segment (lawyers, engineers and other professionals). In addition, the great majority of those engaged in paid employment in the private sector of the economy works in small firms (firms with less than 50 employees), while about a third of the paid employees are employed in the broadly defined public sector (Kanellopoulos et al., 2003). This results in a dualistic labour market. On the one hand, there are those who are either low-skilled self-employed or employed in small firms, receive low wages, work in unstable and precarious conditions, often for very long hours, and face a highly competitive environment. On the other hand, there are those who are working either in the highly unionised public sector or in large private sector firms, and who receive relatively high wages and enjoy far better working conditions.

Three other features of the Greek labour market are also worth mentioning. First, employment rates are lower than the EU average. For example, in 1998 the employment rate was 55.5 per cent against the EU average of 62.2 per cent. Nevertheless since, due to institutional and legal constraints, part-time employment in Greece is the lowest in the EU, Greece's full-time equivalent employment rate of 54.1 per cent was only slightly lower than the EU average of 56.8 per cent. The difference in employment rates between Greece and the EU average is exclusively due to differences in female employment rates (40.2 against 52.9 per cent), whereas male employment rates are almost identical (70.6 against 69.7 per cent). Second, in recent years a very large number of legal and, particularly, illegal immigrants, mostly from former centrally planned Eastern European economies, has entered the Greek labour market. According to some estimates, the share of immigrant workers in the Greek labour force may be as high as 10 per cent. Scant evidence suggests that the overwhelming majority of these workers work in very precarious conditions and receive substantially lower wages than the indigenous workers (Lianos et al., 1996). Third, even though, as noted below, the problem of unemployment is quite serious and the majority of the unemployed are long-term unemployed, less than 1 per cent if GDP is devoted to labour market policies, roughly equally divided between active and passive policies. Unemployment benefits are quite low, virtually flat, and

provided for a limited period of time. Additionally, Greece is one of the few EU countries without a minimum income guarantee scheme, and active labour market policies are rather underdeveloped.

As noted earlier, the Greek education system expanded rapidly in the post-war period. This expansion is reflected in the evolution of the educational composition of the labour force. The evidence of Tables 5a and 5b is revealing. Using the data of three Household Budget Surveys covering the last quarter of the 20<sup>th</sup> century (1974, 1988 and 1999), the labour force is cross-classified according to sex and education (Table 5a) and age and education (Table 5b). The evidence of Table 5a shows that the share of those in the labour force with tertiary education rose from 7.3 per cent in 1974 to 15.3 per cent in 1988 and 22.2 per cent in 1999, while the share of those with less than lower secondary education declined from 71.1 per cent in 1974 to 54.7 per cent in 1988 and 31.4 per cent in 1999. The educational qualifications of both males and females improved, but the improvement is more marked in the case of females. In fact, Kanellopoulos et al. (2003) report that it is not only the average educational qualifications of women that improved rapidly in the period under examination, but that women increased their representation in occupations that require particular educational qualifications and that, until some decades ago, were considered as male bastions. Moreover, the evidence of Table 5b suggests that this improvement in educational qualifications gradually affected all age groups. For example, in 1974 only 7.3 per cent of the labour market participants aged below 35 were tertiary education graduates while 62.2 per cent had completed less than lower secondary education. By 1999, the corresponding percentages were 23.6 and 13.2. Likewise, in 1974 only 5.3 per cent of the labour market participants aged over 50 were tertiary education graduates while 83.2 per cent had not completed lower secondary education. Twenty-five years later, the corresponding percentages were 14.1 and – the still high – 63.8, respectively.

[Tables 5a and 5b here]

### 3.2. Education and unemployment

The link between education and unemployment in Greece has not been studied in great detail. Reliable unemployment statistics exist in Greece only since the early 1980s. At that time, the rate of unemployment was quite low by European standards but, since then, it has risen almost steadily and, in the 1990s, exceeded the EU average. The evidence presented in Table 6 is taken from the 1998 Labour Force Survey (Eurostat, 1999). At that time, the aggregate unemployment rate stood at 11.5 per cent. It then declined to around 9 per cent before starting to rise again. Although the evidence is slightly dated, the overall picture regarding the structure of unemployment corresponds sufficiently well to the picture of the early 2000s.

[Table 6 here]

A number of striking features emerge from the estimates displayed in the table. First, unemployment is substantially higher among females than among males, irrespective of age group or educational qualifications; in 1998 the female unemployment rate stood at 17.5 per cent against a male unemployment rate of 7.4 per cent. Second, unemployment is extremely high in the youngest cohort (15–24 years old) irrespective of sex or educational qualifications; in 1998 it was a stunning 29.7 per cent. The rate of unemployment is relatively low, 4.8 per cent, in the oldest

cohort (50–59 years old), but this may be attributed to early exit from the labour market, especially of the less skilled workers. Third, and most importantly from this survey's point of view, the relationship between unemployment and educational qualifications appears to be non-linear, irrespective of age or sex. More specifically, the lowest unemployment rates are observed among tertiary education graduates (7.4 per cent on average) and the highest among upper secondary education graduates (15.3 per cent on average), while the unemployment rates of those with less than upper secondary education lie somewhere between those of the other two groups (9.9 per cent on average).

The fact that unemployment rates are so high among secondary education graduates should be attributed to the fact that the skills offered in the general strand of upper secondary education, at least, are not suitable for the needs of the Greek labour market, while the system of apprenticeship, which is common in several European countries, is almost non-existent in Greece. Regarding tertiary education, it should be stressed that among University graduates, unemployment is anything but uniform. Kanellopoulos et al. (2003) show that a few years after graduation unemployment is very low among graduates of medicine, engineering, law, economics and business, while the opposite is observed among graduates of humanities. From a more general point of view it should be noted that on a *a priori* theoretical grounds and in a dynamic context, the relationship between unemployment and enrolment in higher education is not as straightforward as sometimes assumed in the Greek public discourse. Higher unemployment rates may reduce the incentive to invest in education either because of the higher risk that they lead to or because they lower the expected wages of higher education graduates. Nevertheless, when unemployment is very high – and especially for those with intermediate educational qualifications, as in the case of Greece – the opportunity cost of studying declines and the incentive to invest in higher education rises.

### 3.3. Education and wage inequality

Human capital theory considers education as an investment in human capital, which yields a return in the form of enhanced future wages (Becker, 1964). Therefore, since education is an essential determinant of wages, the distribution of education is likely to affect the distribution of wages. Nevertheless, several empirical studies also show that wages differ not only between workers with different levels of education but also within narrowly defined educational groups. In fact, usually differences within educational groups account for a substantially larger part of total wage variation than differences between educational groups. Within educational levels wage inequality may be due to unobserved skills or various observable characteristics of the workers.

Several studies examining a number of aspects of human capital theory in Greece, using a variety of data sets, can be found in the literature. Cholezas and Tsakloglou (1999) provide a comprehensive survey. A number of studies have appeared since then, though (Tsakloglou and Cholezas, 2001; Kanellopoulos and Mavromaras, 2002; Kanellopoulos et al., 2003; Papapetrou, 2004). Nevertheless, several channels of the link between education and earnings remain unexplored. Instead of reproducing the findings of the survey, we estimate Mincerian earnings functions on the data most widely used in the existing studies; i.e., those of the Household Budget Surveys for five years (1974, 1982 (only for monthly earnings), 1988, 1994 and 1999) and provide

a summary of the main results. The corresponding estimates are reported in Tables 7a (for hourly earnings) and 7b (for monthly earnings). The data used refer to net earnings after taxes and national insurance contributions ('take home pay'). Most of the results reported in Tables 7a and 7b are in line with the results of the existing studies.

[Tables 7a and 7b here]

In all years under examination, the returns to an additional year of education are higher for females than for males. For example, in the case of hourly earnings, the return to education for females varies between 8.0 and 11.7 per cent per year depending on the surveyed year, whereas in the case of males it ranges between 5.6 and 8.3 per cent. Although these estimates look relatively high, especially if we consider the fact that they refer to net rather than gross earnings, Harmon et al. (2001) using meta-analysis for fifteen European countries, and after controlling for several factors, conclude that the returns to schooling in Greece are relatively low in comparison with the rest of the countries included in their analysis. The evidence of Tables 7a and 7b further suggests that the returns to education are higher when hourly earnings are used instead of monthly earnings. The results are mixed regarding the returns to education in the public and the private sector of the economy. When hourly earnings are used, returns to education appear to be higher in the public sector, whereas the opposite holds when distributions of monthly earnings are utilised.

Irrespective of the distribution used, the returns to education appear to have declined substantially between the mid-1970s and the 1980s, but to have recovered in the 1990s. In the international literature, three possible explanations have gained prominence for the analysis of changes in wage inequality and returns to education in recent decades: skill-biased technological change (that is, an increase in the demand for particular types of skills that is not matched by an equivalent rise in supply), international trade and the institutional framework. The reasons behind the changes in the returns to education in Greece have not been investigated in detail. A number of studies (Kioulafas et al., 1991; Lambropoulos, 1992; Lambropoulos and Psacharopoulos, 1992) attribute the decline in private returns to education in the late 1970s and 1980s to the rapid expansion of the education system, which resulted in an increased supply of better-educated workers. At the same time, slow economic growth contributed to a negligible rise in the demand for such workers, thus producing a decline in returns to education. Contrary to this, Tsakloglou and Cholezas (2001) argue that although all three aforementioned factors are likely to have contributed to the observed changes in private returns to education, the main contribution should probably be attributed to the institutional framework (especially taking into account that incomes policies were widely used until the early 1990s); a view that is also shared by Kanellopoulos et al. (2003). More specifically, until the late 1970s minimum wages were set at a different level for males and females, and a considerable proportion of females was remunerated with the minimum wage. When the institutional framework changed and the minimum wage was set at a uniform rate for both sexes, thus raising the minimum wage for women, the wage differentials between low- and high-skilled women declined substantially, as did also the returns to education. Even more importantly, after the election of a socialist government in 1981, real hourly earning rose by 10.4 per cent between 1981 and 1982 while productivity and GDP per capita were declining. This rise was driven by a 17.3 per cent increase in the minimum wage in real terms. At the same time, wage

indexation policies were introduced. However, indexation was fully realised only up to a particular wage level, and was less than complete above it. These developments, coupled with high inflation rates, led to a compressed wage structure. In the mid-1980s severe austerity measures were introduced, which reversed the earlier gains of wage and salary earners, but left the wage structure largely unchanged. As a consequence of this compressed wage structure, returns to education appear to have declined substantially in the 1980s. Wage indexation was abolished in the 1990s, incomes policies were abandoned, the labour market was gradually liberalised and, furthermore, there was an influx of low-skilled immigrant workers that mitigated the growth rate of the nominal wages of indigenous low-skilled workers. As a result, wage differentials across skill levels rose and private returns to education increased accordingly (even in the early 1990s, when the education system was expanding rapidly and the growth rates were quite low).

The evolution of aggregate wage inequality followed a pattern similar to that of private returns to education. It declined between the 1970s and the 1980s and rose in the 1990s. In fact, in 1999 wage inequality was higher than in 1974. As the evidence of Table 8 shows, this pattern is observed irrespective of whether distributions of monthly or hourly earnings are utilised, irrespective of the index of inequality used and irrespective of whether the reference sample consists of all employees, male employees or female employees only. Most probably the aforementioned institutional changes, which are likely to explain the evolution of private returns to education, also explain the evolution of wage inequality. Odink and Smits (2001) also report similar trends, albeit for a shorter period. They also note that Greece's inequality in the distribution of hourly earnings is one of the highest in Europe. It is worth mentioning at this point that Kanellopoulos et al. (2003), using evidence from Household Budget Surveys, show that in real terms, monthly earnings rose very substantially between 1974 and 1982, declined between both 1982 to 1988 (considerably) and 1988 to 1994 (mildly), only to rise again between 1994 and 1999. Nevertheless, even in 1999 they were lower than in 1982. This trend is observed for both males and females, but varies within narrowly defined sub-groups of workers. Similar but less pronounced results, and for a shorter period, are also reported by Tsakloglou and Cholezas (2001) who use hourly instead of monthly earnings.

[Table 8 here]

Although returns to education are higher for females than for males, potential experience seems to play a more important role in the earnings determination process of male than of female employees. In all years under examination, the age-earnings profiles of female workers are substantially flatter than those of male workers. An example taken from Tsakloglou and Cholezas (2001) for 1994 is provided in Figure 1. Of course, it should be noted that the use of potential rather than actual experience (due to lack of data) may be misleading, since the working careers of female employees are more likely to be interrupted for voluntary (such as child birth) or involuntary (such as unemployment) reasons. Moreover, it should be mentioned that, in reality, very few workers - males or females - are located in the descending part of the age-earnings profile curve.

[Figure 1 here]

Several studies show that the returns to education are non-linear with respect to levels of education (Kanellopoulos, 1982, 1985, 1986, 1997; Psacharopoulos, 1982; Kioulafas et al., 1991; Lambropoulos and Psacharopoulos, 1992; Magoula and

Psacharopoulos, 1999; Tsakloglou and Cholezas, 2001). Table 9 reproduces the evidence of Tsakloglou and Cholezas (2001) and shows that marginal rates of return to education are rising with respect to the level of education in the cases of both males and, to a lesser extent, females. For example, in 1994 each additional year of primary, lower secondary, upper secondary (non-technical) and university education increased the private returns to education of male workers by 2.1, 6.1, 6.9 and 8.7 per cent, respectively. Moreover, if these estimates are adjusted for the probability of unemployment per educational level and age group, the differences are even more striking (2.0, 5.4, 6.3 and 9.1 per cent, respectively).

[Table 9 here]

Martins and Pereira (2004) and Cholezas (2004a) examine whether the returns to education are uniform across the wage distribution using quantile regression techniques, the former within a cross-country framework, the latter using Greek data for the period 1974 to 1999. The basic idea behind quantile regressions is that, if returns are higher at the top end of the earnings distribution than at the bottom end, then education boosts earnings inequality, since education is a better investment for the 'rich'. If the opposite holds true, then education reduces earnings inequality. Martins and Pereira (2004) report that in the 15 European countries and USA that they examine, Greece is the only country – apart from Germany – in which the estimated returns to education are higher at the bottom deciles of the conditional earnings distribution; i.e., the slope of the returns–quintiles relationship is negative. Therefore, education appears to reduce wage inequality. For most years, Cholezas (2004a) reports a U-shaped pattern between returns to education and the quintiles of the conditional earnings distribution for both males and females (Figures 2a and 2b). However, when he tests the significance of the differences across quintiles, he reports that, in most cases, the differences of the estimated parameters are not statistically significant.

[Figures 2a and 2b here]

Three other factors that may influence the rate of return to education and, hence, the dispersion of earnings have been examined in the literature: socio-economic background, discrimination, and screening. Regarding the worker's socio-economic background, the only studies available are those of Patrinos (1992, 1995), who uses data from the late 1970s. He investigates the extent to which access to tertiary education, which is the most costly and rewarding level of education, is influenced by the father's education and demonstrates that individuals with better-educated fathers are likely to be better-educated themselves. In addition, after defining four groups of individuals according to the father's education, he concludes that private returns to education are higher for those with higher socio-economic background – a phenomenon usually observed in developing rather than developed countries. Of course, taking into account the evidence of Table 3, it can be argued that those from more privileged socio-economic background are likely to receive education of higher quality, which may be reflected in higher quality of human capital, higher productivity and, therefore, higher returns to education, keeping the years of schooling constant. However, Patrinos offers two equally plausible explanations that seem to be valid in the case of Greece. He argues that it is very likely that in the Greek labour market where contacts and connections matter a lot, the observed pattern is the outcome of exploitation of the superior contacts and connections that better-educated fathers preserve and 'transmit' to their children. Moreover, the more privileged are able to afford a lengthy job search period since they are being

supported by their families, while those with a less privileged socio-economic background are more likely to end their search period quickly, and wind up in inappropriate jobs.

The effect of discrimination on the observed earnings gap between male and female workers has been analysed in a number of papers. Kanellopoulos (1982) uses data from the 1960s and concludes that in a simple Mincerian framework, discrimination (i.e., the unexplained part of the earnings differential) accounts for almost 60 per cent of the observed male-female earnings gap. This percentage declines to 30, when additional explanatory variables are added. Psacharopoulos (1982) investigates the gender earnings differential in the late 1970s, and finds the female to male earnings ratio to be 65 per cent. He reports that almost 90 per cent of the gender earnings gap is accounted for by discrimination, while more educated female employees, within a given occupational group, are less discriminated against. Likewise, Patrinos and Lambropoulos (1993), using data from the early 1980s, conclude that almost the entire earnings differential between sexes can be attributed to discrimination. Kanellopoulos and Mavromaras (2002) utilise information from the Household Budget Surveys of 1988 and 1994, and show that selectivity bias is important and that females pay a large premium in terms of lower wages in order to be employed. According to their estimates, in 1988 the proportion of the wage gap due to discrimination was 71.5 per cent. By 1994 it had declined to 54 per cent. Unlike the rest of the studies, which have examined male-female earnings differences using distributions of hourly earnings, Kanellopoulos et al. (2003) use monthly earnings and examine both the level and the evolution of the structure of the earnings gap based on data from all Household Budget Surveys with national coverage. Their results are reported in Table 10. The earnings gap declined substantially between 1974 and 1982, from 38.1 to 26.1 per cent, and remained more or less stable thereafter. The proportion of the gap attributed to discrimination declined from 67.8 per cent in 1974 to 27.5 per cent in 1982, only to increase steadily thereafter and reach the level of 87.9 per cent in 1999. The authors attribute the dramatic increase in the share of discrimination between 1982 and 1999, when there was no perceptible change in the earnings gap, to the fact that during this period the educational qualifications of female employees improved substantially vis-à-vis those of male employees but this improvement was not reflected in their monthly earnings.

[Table 10]

Papapetrou (2004) studies the earnings differential between sexes at different points of the earnings distribution using data from the 1999 wave of the ECHP. Her results indicate that the gap differs along the earnings distribution and that it tends to be larger at the top and at the bottom of the distribution. The main source of the differential is the unexplained part (discrimination), which takes its highest values at the bottom (60.7 per cent) and, especially, at the top decile point of the distribution (65.6 per cent). Cholezas (2004b) attempts to decompose the gender earnings differential in the private sector of the economy, after correcting for selectivity bias, into three distinct components, namely the characteristics component, the discrimination component and the selectivity component for the period 1988 to 1999. The selection equation shows that better-educated workers, especially women, are more likely to be employed in the public sector. Then, the author decomposes the earnings gap into all components (one for each explanatory variable). In line with most previous studies, he shows that the largest part of the earnings differential is to be attributed to discrimination.

Apart from earnings differentials between sexes, two studies also examine the earnings differentials between public and private sector employees. As noted earlier, about one-third of all workers engaged in paid employment work in the broadly defined public sector (civil service, local administration, public utilities, state-controlled enterprises). Moreover, their educational qualifications are, on average, higher than those of private sector employees. For example, Kanellopoulos et al. (2003) report that of all tertiary education graduates that were working, 41.1 per cent were employed in the public sector in 1998 (this share was even higher in earlier periods). Kioulafas et al. (1991) use data covering the period 1975 to 1985 and conclude that earnings, as well as returns to education and potential experience are higher in the public sector of the economy. Kanellopoulos (1997) investigates the public-private sector earnings differential separately for each sex using data for the late 1980s. He shows that both sexes are better rewarded in the public sector and reports evidence of both selectivity bias (for public sector employment) and discrimination (across sectors of employment).

Finally, a number of studies have examined the role of education as a screening device, using different methodologies and reaching different conclusions. Kanellopoulos (1985) examines the effect of schooling on earnings in the 1960s within three different experience groups, using payroll data. His results indicate that schooling is extremely important in the first three years of working life, which reinforces the weak screening hypothesis. Returns decrease in the following years, since factors such as ability and skills influence earnings and reduce the importance of schooling. Lambropoulos (1992) investigates the issue using mid-to-early career earnings ratios calculated from payroll data for 1977, 1981 and 1985, and fails to identify patterns of screening in the Greek labour market. Likewise, Magoula and Psacharopoulos (1999) use data from the 1994 Household Budget Survey to test the screening hypothesis by use of experience-earnings profiles and examination of the impact on earnings of an interaction term between tertiary education and potential experience, and fail to identify any evidence of screening. Tsakloglou and Cholezas (2001), who also use Household Budget Survey data, compare the returns to education for self-employed persons, who do not face signalling effects, with those of employees, who may do so. It turns out that the self-employed have lower returns to education, which can be considered as an indication that education operates as a screening device in the Greek labour market. Even when the sample is restricted to private sector employees, the screening hypothesis cannot be rejected, at least for male workers.

#### **4. Education and the income distribution**

##### **4.1. Education and aggregate inequality**

Naturally, since education is one of the main determinants of earnings and earnings constitute the most important component of total income, education is likely to affect aggregate inequality. The contribution of education to aggregate inequality in Greece has been examined in a number of papers attempting one-way or multivariate decomposition of inequality by population sub-groups (Lazaridis et al., 1989; Tsakloglou, 1992, 1993, 1997; Mitrakos and Tsakloglou, 1997a, 1997b, 1998; Papatheodorou, 2000; Mitrakos et al., 2000; Tsakloglou and Mitrakos, 2004). The conclusions of these studies are very similar: education is the single most important determinant of aggregate inequality. For example, the evidence of Tsakloglou and

Mitrakos (2004), using the data of five Household Budget Surveys covering the period 1974 to 1999, reproduced in Table 11 is very clear.

In this table, the entire population is grouped into mutually exclusive and exhaustive groups using five alternative criteria – region of residence, type of locality, demographic group, socio-economic category of the household head, and educational level of the household head – and the structure of inequality in the distribution of equivalent consumption expenditure is analysed (consumption expenditure is considered as a better proxy for the unobserved welfare level of the individuals than current disposable income, but similar results are also derived when income distributions are used instead). The contribution of differences ‘between groups’ to aggregate inequality is the proportion of total inequality emanating from disparities across groups when differences ‘within groups’ remain intact, using as index of inequality the mean logarithmic deviation, which is a ‘strictly additive decomposable’ index of inequality. In general, the more homogeneous the population groups and the larger the number of population groups, the larger the proportion of aggregate inequality attributable to disparities ‘between groups’.

[Table 11 here]

In all years under examination, the contribution of educational factors to the determination of aggregate inequality is higher than the contribution of any other partition of the population, even though in most cases the number of groups in the other partitions is substantially larger than the partitioning of the population into educational groups (five groups in all years, apart from 1982). In 1974, disparities between educational groups accounted for around a quarter of aggregate inequality. In the rest of the years under examination, the corresponding share hovers around 20 per cent. These results are reinforced by the results of multivariate decomposition of inequality (Tsakloglou, 1992; Mitrakos and Tsakloglou, 1997b, 1998; Tsakloglou and Mitrakos, 2004), which show that even when a fine partition of the population is attempted, using all the grouping factors of Table 11 simultaneously, education is the only factor that accounts independently for a high proportion of aggregate inequality. Moreover, Mitrakos and Tsakloglou (2000) using inequality trend decomposition analysis report that, *ceteris paribus*, the upgrading of the educational qualifications of the population during the last quarter of the 20<sup>th</sup> century (captured by the changes in the population shares of the educational groups) had an adverse effect on aggregate inequality and that the observed decline in aggregate inequality during that period should be attributed to changes in disparities both within and across educational groups.

#### 4.2. Education, poverty and social exclusion

Besides inequality, a number of studies examining the structure of poverty in Greece show that the risk of falling below the poverty line is anything but uniform across educational groups (Tsakloglou, 1990; ISSAS, 1990; Karayiorgas et al., 1990; Hagenars et al., 1994; Tsakloglou and Panopoulou, 1998; Mitrakos et al., 2000). At least throughout the last quarter of the 20<sup>th</sup> century, for which empirical evidence is available, poverty is negatively related to education. Table 12 reproduces estimates of Tsakloglou and Panopoulou (1998) for the mid-1990s regarding the poverty rates and the contributions to aggregate poverty of particular population groups when the population is grouped by the educational level of the household head.

[Table 12 here]

Irrespective of the distribution used (consumption expenditure, disposable income, a proxy for the 'permanent income' of the household, or a composite non-monetary welfare indicator) a strong negative relationship is always evident between the poverty rate and the educational level of the household head. Poverty is negligible in households headed by tertiary education graduates (1.4 to 2.4 per cent depending on the distribution used) but quite common in households headed by persons who did not complete primary education or completed only primary education. In fact, depending on the distribution used, between 85 and 95 per cent of all poor individuals could be found in the latter two groups in the mid-1990s. The results are even stronger when distribution-sensitive poverty indices are used instead of the poverty rate as indicators of poverty.

Moreover, using probabilistic techniques, Loizides and Giahalis (1992) and Mitrakos et al. (2000) show that, even when several other factors are included in the analysis, education always turns out to be a very significant factor affecting the probability of falling below the poverty line. Likewise, Papatheodorou and Piachaud (1998) examine the role of educational factors in the inter-generational transmission of poverty and conclude that both father's and mother's education are significant factors in explaining whether in his or her adult life the individual will be located above or below the poverty line. With respect to the effect of the educational expansion on poverty in recent decades, Mitrakos and Tsakloglou (2000) using poverty trend decomposition techniques conclude that, *ceteris paribus*, the effect of changes in population shares regarding the educational composition of the population accounted for about two-fifths of the observed decline in relative poverty.

In recent years, in the public discourse of several European countries there has been a shift in emphasis from poverty to social exclusion. Although the operationalisation of the concept is far from uncontroversial, Papadopoulos and Tsakloglou (2004) select a particular approach and, using decomposition analysis, show that the risk of social exclusion is strongly inversely related with the educational level. In addition, Tsakloglou and Papadopoulos (2002) using logit analysis demonstrate that in Greece as in most EU countries, even after controlling for several factors, low educational qualifications increase substantially the risk of social exclusion.

## **5. Conclusions**

The present article has surveyed the existing evidence on the relationship between education and inequality in Greece. This relationship appears to be strong. Greece experienced a rapid educational expansion in recent decades. Nevertheless, inequities are evident at all levels of the education system; especially as regards access to the most rewarding level, that is, university education. Furthermore, many facets of the inequities observed in the labour market are associated with education, while education appears to be the single most important factor that shapes the overall distribution of income and influences the probability of poverty. Even though the number of papers surveyed is not small, several aspects of the detailed channels through which education influences the level and the structure of inequality in Greece are still missing. This is especially evident as far as issues of the impact of the quality of education on earnings, on the effects of socio-economic background on earnings in recent years, as well as labour market inequities and, particularly,

inequalities in the distribution of wages are concerned. Most probably, empirical research in the near future will shed lights to these areas, too.

**Table 1. The structure of the Greek education system in the mid-1990s**

<b>• Primary education</b>		
1. Pre-school education: Nursery school	Ages 4-5	Non-compulsory
2. Basic education: Primary school Duration of studies: 6 years	Ages 6-11	Compulsory
<b>• Secondary education</b>		
1. Lower secondary education: Gymnasium Duration of studies: 3 years	Ages 12-14	Compulsory
2. Upper secondary education: Lyceum Duration of studies: 2 to 3 years a. General Lyceum (65% of students) b. Technical-Vocational Lyceum (22% of students) c. Technical-Vocational School (8% of students) d. Integrated Lyceum (5% of students)	Ages 15-17	Non-compulsory
<b>• Tertiary education</b>		
1. Higher Education Institutions: Universities (AEI) Duration of studies: 4 to 6 years		
2. Technological Education Institutions (TEI) Duration of studies: 3 years		

Source: Gouvias (1998a) and Tsakloglou and Antoninis (1999).

**Table 2. Indices of unequal access to university according to father's occupational status: all first-year university students, 1984/85 to 1987/88**

Academic year	Father's occupational status				
	White-collar worker	Farmer	Blue-collar worker	Unemployed	Other (mainly pensioner)
1984-85	2.01	0.54	0.90	0.07	0.19
1985-86	2.08	0.49	0.93	0.11	0.15
1986-87	2.19	0.49	0.88	0.11	0.14
1987-88	2.13	0.54	0.94	0.12	0.16
1988-89	2.20	0.53	0.96	0.09	0.10
1989-90	2.14	0.46	0.97	0.17	0.25
1990-91	2.10	0.50	0.94	0.14	0.25
1991-92	2.19	0.45	0.88	0.20	0.24
1992-93	2.10	0.43	0.95	0.16	0.26
1993-94	1.95	0.43	1.04	0.13	0.20
1994-95	1.97	0.36	0.95	0.17	0.20
1995-96	2.06	0.35	0.84	0.11	0.18
1996-97	1.97	0.33	0.89	0.15	0.16
1997-98	2.01	0.31	0.85	0.14	0.15

Source: Chryssakis and Soulis (2001).

**Table 3. Participation in education and private spending per upper secondary education student per quintile, Greece 1994**

	Quintile				
	Bottom	Lower middle	Middle	Upper middle	Top
Proportion of persons aged 15-17 not in education, %	31.51	11.16	10.05	9.18	2.50
Proportion of upper secondary education students in technical education, %	23.62	21.67	18.97	24.85	12.53
Proportion of households with upper-secondary education students with expenditures on fees for cram schools and private tuition (%)	22.00	42.33	52.51	57.87	62.82
Monthly mean private spending per upper-secondary education student attending a cram school or taking private tuition (in drachmas)	9,226	15,096	19,218	26,318	33,875
Ratio of tertiary education to upper secondary education students	0.3068	0.3644	0.5264	0.6179	0.4989
Ratio of university to general upper secondary education students	0.2769	0.2760	0.3850	0.5501	0.3632

Source: Antoninis and Tsakloglou (2001).

**Table 4. Distributional impact of education in-kind transfers, Greece 1994**  
**(Index of inequality: mean log deviation)**

Distribution	Sample		
	All households	Households with heads aged 25-60	Households with members aged 6-24
Initial distribution (pre-transfer)	0.1574	0.1360	0.1246
	Change in inequality after the addition of the education transfers, %		
Final distribution (post-transfer)	-2.16	-9.63	-11.88
Initial distribution plus primary transfers	-1.90	-5.10	-6.91
Initial distribution plus secondary transfers	-1.64	-4.75	-6.17
Initial distribution plus tertiary transfers	+1.52	+0.15	+2.89
Initial distribution plus TEI* transfers	+0.13	-0.22	+0.24
Initial distribution plus AEI** transfers	+1.33	+0.37	+2.73

Note: \* TEI: Technological Institutes; \*\* AEI: Universities.

Source: Antoninis and Tsakoglou (2001).

**Table 5a. Educational qualifications of the labour force (by sex)**

Educational level	1974			1988			1999		
	M	F	All	M	F	All	M	F	All
Tertiary	7.5	6.7	7.3	13.4	15.3	14.1	20.2	25.3	22.2
Upper secondary	14.8	15.8	15.1	24.1	24.1	24.1	34.3	34.5	34.4
Lower secondary	7.9	3.5	6.5	11.4	5.9	9.5	13.5	9.8	12.1
Primary	52.3	41.8	49.1	42.2	39.3	41.2	29.0	24.0	27.1
Primary not completed	17.5	32.2	22.0	8.9	15.4	11.1	3.0	6.3	4.3

Notes: M refers to males, F to females.

**Table 5b. Educational qualifications of the labour force (by age group)**

Educational level	1974			1988			1999		
	Below 35	36–49	Over 50	Below 35	36–49	Over 50	Below 35	36–49	Over 50
Tertiary	7.3	8.3	5.3	16.5	15.3	8.0	23.6	25.6	14.1
Upper secondary	21.3	13.0	7.5	37.4	18.4	9.5	48.2	33.1	14.4
Lower secondary	9.1	5.3	4.1	14.1	7.5	4.4	15.0	11.9	7.6
Primary	55.5	43.8	47.6	30.8	50.6	45.4	12.2	27.7	49.9
Primary not completed	6.7	29.5	35.6	1.3	8.2	32.6	1.0	1.7	13.9

Source: Authors' own estimates from Household Budget Survey micro-data.

**Table 6. Unemployment rates by educational attainment level, age group and sex, Greece 1998**

		All	Less than upper secondary	Upper secondary	Tertiary
15_24 years	All	29.7	24.6	32.2	34.0
	Males	21.4	18.7	23.5	..
	Females	39.3	37.8	40.1	36.5
25_49 years	All	9.5	9.6	11.0	6.9
	Males	5.9	6.0	6.6	4.6
	Females	14.6	15.8	17.1	9.7
50_59 years	All	4.8	4.8	6.7	..
	Males	3.9	3.9	5.3	..
	Females	6.7	6.6	10.4	..
15_59 years	All	11.5	9.9	15.3	7.4
	Males	7.4	6.9	9.6	4.5
	Females	17.5	15.4	23.0	11.1

Note: .. indicates non-zero but extremely unreliable estimate.

Source: Eurostat (1999).

**Table 7a. OLS estimates of log hourly earnings**

	1974	1988	1994	1999
<b>Men</b>				
Schooling	0.073	0.056	0.074	0.083
Pot. Exper.	0.064	0.054	0.076	0.075
Pot. Exper. Sq.	-0.097	-0.078	-0.103	-0.098
Adj. R Squared	0.397	0.327	0.321	0.311
<b>Women</b>				
Schooling	0.115	0.080	0.102	0.117
Pot. Exper.	0.050	0.041	0.060	0.078
Pot. Exper. Sq.	-0.073	-0.059	-0.082	-0.112
Adj. R Squared	0.517	0.375	0.256	0.307
<b>Private sector</b>				
Schooling	-	0.054	0.067	0.071
Pot. Exper.	-	0.050	0.062	0.062
Pot. Exper. Sq.	-	-0.074	-0.082	-0.084
Women=1	-	-0.207	-0.252	-0.248
Adj. R Squared	-	0.273	0.199	0.213
<b>Public sector</b>				
Schooling	-	0.062	0.078	0.089
Pot. Exper.	-	0.029	0.052	0.064
Pot. Exper. Sq.	-	-0.034	-0.068	-0.092
Women=1	-	-0.046	-0.081	-0.109
Adj. R Squared	-	0.332	0.292	0.302

**Table 7b. OLS estimates of log monthly earnings**

	1974	1982	1988	1994	1999
<b>Men</b>					
Schooling	0.059	0.043	0.049	0.066	0.071
Pot. Exper.	0.063	0.054	0.055	0.073	0.074
Pot. Exper. Sq.	-0.097	-0.088	-0.081	-0.101	-0.101
Adj. R Squared	0.356	0.227	0.319	0.288	0.289
<b>Women</b>					
Schooling	0.095	0.060	0.057	0.073	0.084
Pot. Exper.	0.041	0.033	0.037	0.056	0.071
Pot. Exper. Sq.	-0.062	-0.048	-0.057	-0.084	-0.111
Adj. R Squared	0.464	0.261	0.300	0.190	0.228
<b>Private sector</b>					
Schooling	-	-	0.051	0.065	0.068
Pot. Exper.	-	-	0.050	0.064	0.064
Pot. Exper. Sq.	-	-	-0.076	-0.089	-0.089
Women=1	-	-	-0.243	-0.269	-0.294
Adj. R Squared	-	-	0.317	0.217	0.231
<b>Public sector</b>					
Schooling	-	-	0.046	0.058	0.059
Pot. Exper.	-	-	0.031	0.049	0.068
Pot. Exper. Sq.	-	-	-0.041	-0.068	-0.104
Women=1	-	-	-0.157	-0.206	-0.234
Adj. R Squared	-	-	0.330	0.286	0.293

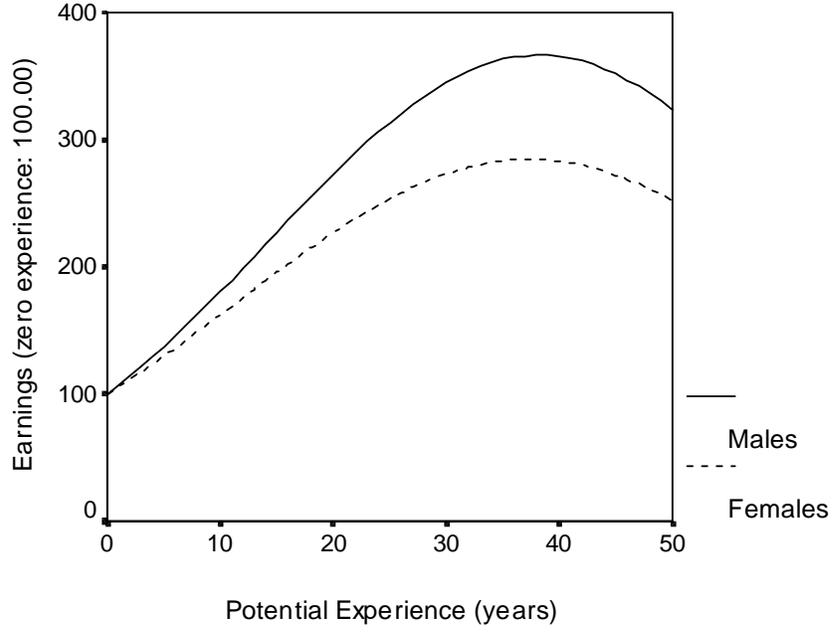
Source: Authors' own estimates from Household Budget Survey micro-data.

**Table 8. Evolution of earnings inequality in Greece, 1974 to 1999**

	1974	1982	1988	1994	1999
<i>Monthly earnings:</i>					
Males - Gini	0.292	0.215	0.225	0.272	0.301
Males - Mean log deviation	0.150	0.075	0.095	0.158	0.182
Females - Gini	0.287	0.196	0.212	0.257	0.304
Females - Mean log deviation	0.150	0.060	0.085	0.162	0.209
<i>Hourly earnings:</i>					
All - Gini	0.312	-	0.249	0.289	0.322
All - Mean log deviation	0.161	-	0.106	0.150	0.183

Source: Kanellopoulos et al. (2003) and Cholezas and Tsakloglou (2004).

Graph 1. Age-earnings profiles - Greece, 1994



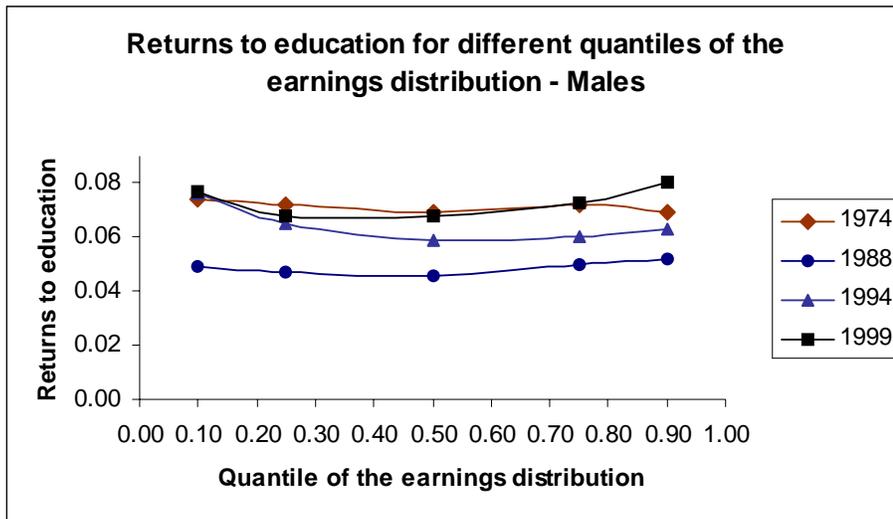
**Table 9. Marginal annual rates of return per educational level, Greece 1994  
(%, unadjusted and adjusted for unemployment)**

Educational level	Unadjusted		Adjusted	
	Males	Females	Males	Females
Primary	2.1	- *	2.0	- *
Lower secondary	6.1	- *	5.4	- *
Upper secondary	6.9	9.2	6.3	7.5
Upper secondary technical	6.3	11.9	5.9	9.3
Tertiary technical (TEI)	7.0	6.6	6.6	7.8
University (AEI)	8.7	10.4	9.1	10.6

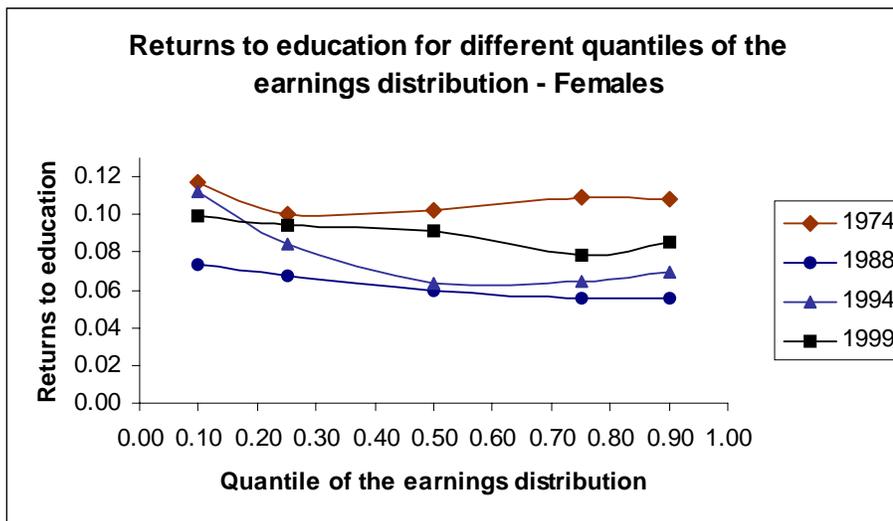
Note: \* indicates that the coefficient is statistically non-significant.

Source: Tsakloglou and Cholezas (2001).

Graph 2a



Graph 2b



Source: Cholezas (2004a).

**Table 10. Male-female monthly earnings gaps and the contribution of discrimination, Greece 1974 to 1999**

Year	Earnings gap	Proportion due to discrimination
1974	38.1%	67.8%
1982	26.1%	27.5%
1988	22.9%	46.3%
1994	25.9%	70.7%
1999	23.7%	87.9%

Source: Kanellopoulos et al. (2003).

**Table 11. Structure of inequality, Greece 1974 to 1999**

Grouping criterion	Number of groups	% of aggregate inequality attributable to differences 'between groups'				
		1974	1982	1988	1994	1999
Region	11	14.0	8.2	7.4	6.9	7.2
Type of locality	4	13.3	9.8	10.2	6.5	10.0
Demographic group	9	3.7	5.6	6.8	6.4	7.2
Socio-economic category of household head	9	17.0	12.5	13.5	11.5	13.8
Educational level of household head	5	25.2	17.7*	20.8	21.0	19.9

Note: \* 4 groups only.

Source: Tsakloglou and Mitrakos (2004).

**Table 12. Structure of poverty according to the educational level of the household head, using alternative welfare indicators, Greece 1994**

Educational level of the household head	Poverty rate according to:				
	Population share	CE	CI	PI	NM
Tertiary education	11.2	1.4 (0.9)	1.4 (0.9)	2.4 (3.6)	2.2 (1.4)
Upper secondary education	18.3	4.6 (4.8)	6.6 (7.3)	4.9 (1.2)	5.0 (5.1)
Lower secondary education	8.8	13.7 (6.9)	10.8 (5.7)	3.5 (4.1)	9.2 (4.5)
Primary education	45.2	20.0 (52.2)	19.2 (52.4)	8.0 (48.3)	20.0 (50.0)
Primary education not completed	16.5	36.8 (35.0)	33.6 (33.5)	20.7 (45.9)	42.9 (39.1)
	100.0	17.4	16.6	7.4	18.2

Notes: CE refers to Consumption Expenditure; CI to Current Income; PI to Permanent income; and NM to Composite Non-Monetary Welfare Indicator. The figures in parentheses are contributions to the aggregate poverty rate.

Source: Tsakloglou and Panopoulou (1998).

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