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Exploring Mismatches Between Higher Education and the Labour Market in Greece

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& YANNIS CALOGHIROU

Introduction

This article focuses on two basic mismatches between the higher education system and the labour market in Greece. The first concerns the interplay between supply and demand of a highly educated labour force. The second concerns the relationship between the knowledge and skills required by the economy and the ones provided by the higher education system.

The study of the first mismatch is based on international evidence that Greece forms the most notable exception in EU or OECD countries regarding the high unemployment rates of young graduates. This phenomenon is attributed to the gap between the (more or less satisfied) strong demand for higher education and the limited demand of the domestic economy for highly educated personnel. Then, different possible factors explaining the puzzling persistence of a strong demand for higher education in Greece are discussed. The rest of the article focuses on the second mismatch by analysing curriculum assessments by Greek graduates, based on a field research on the career paths of National Technical University of Athens (NTUA) graduates. The data show that even the 'upper' segment of the Greek higher education system is adapting rather slowly to the new mix of knowledge and skills required by the emerging knowledge-based economy. It is then suggested that the development of a mass university, characterised by low ratios of public expenditure per student and high ratios of students to academic staff, presents one of the major obstacles for the successful transformation of Greek higher education in the 21st century.

The Unemployment of Higher Education Graduates

In the last two decades, the labour markets of many OECD countries have witnessed major changes in the relative position of low- and highly-skilled workers. On the one hand, inequalities between the earnings of the low- and the highly-skilled have increased. On the other, the less skilled workers were much more vulnerable to the risk of unemployment than the highly-skilled ones. Amongst the theories that have been developed to explain the deteriorating position of the less educated workers, the hypothesis of a skill-biased technical change (Machin & Van Reenan, 1998) seems to find the most support in the relevant literature.

TABLE I. Unemployment rates by level of educational attainment for the 25–29-year-old age group (1998)

Level of education	Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary-type B	Tertiary-type A and advanced research programmes
Greece	13%	16.2%	21.5%	22.8%
Italy	18.9%	18.6%	—	27%
Portugal	5.1%	5.1%	2.5%	8.1%
Spain	24.6%	21.9%	19.5%	28.6%
OECD	15.2%	9.0%	7.1%	7.7%

Source: OECD (2000).

TABLE II. Relative unemployment rates by level of educational attainment for the 25–29-year-olds (1998) (base: below upper secondary education = 100)

Level of education	Below upper secondary education	Upper secondary and post-secondary non-tertiary education	Tertiary-type B	Tertiary-type A and advanced research programmes
Greece	100	125	165	175
Italy	100	98	—	143
Portugal	100	100	49	159
Spain	100	89	79	116
OECD	100	59	47	51

Source: OECD (2000).

But with respect to the unemployment rates of different educational groups where international comparisons are easier to carry out, Greece does not follow the international trend above. Indeed, it seems to be the most notable exception within OECD countries in the observed negative correlation between the level of educational attainment and the unemployment rate. This is mainly due to the high unemployment rates of young graduates. As shown in Table I, in the 25–29-year-old age group, Greece shares with Italy and Spain the highest unemployment rates of graduates within OECD.¹ Most importantly, the comparison between the unemployment rates of different educational levels for the same age group shows that Greece occupies the highest position in the relative unemployment indicator of higher education graduates among OECD countries (Table II). Both supply and demand sides are responsible for this exception.

The Limited Demand for Higher Education Graduates

The limited demand of the domestic economy for higher education young graduates is mainly due to the weaknesses of the business sector and the poor economic performance of the country in the last decades.

Many Greek firms are SMEs that are specialised in low-tech, industry or services activities (Liargovas, 1997). Given also their traditional management methods (Makridakis *et al.*, 1997), they are unwilling to hire personnel with a higher educational background. But the demand expressed by the cluster of

dynamic firms is not enough to counterbalance the incapacity of the traditional sector to employ higher education graduates. As a result, according to different estimations (Pesmazoglu, 1994, pp. 293–4; OECD, 1997, p. 116), some three-quarters of the graduates are employed in the broader public sector.

Perhaps the best example to illustrate the incapacity of the Greek firms to meet the supply of highly educated workers is the underdeveloped R&D activities. One could suppose that this reflects the inability of higher education mechanisms to supply the required quantity and quality of researchers. Not only does Greece have an excess of PhD holders, but most of them graduated from well-known European and American universities and technical institutes. Thus, the fact that many PhD holders have no alternative but to wait to be employed by universities or public research institutes cannot be attributed to the quality of their knowledge and skills. In other words, the missing link here is not the supply of high-quality researchers but the incapacity of the economy, and especially of the business sector, to absorb them.²

The weakness of the business sector is also the main cause for the discrimination against young graduates in the labour market. As most Greek firms are unwilling or unable to invest in the training of their employees, they seek young graduates who have enough experience to be immediately productive.³ The oversupply of young graduates encourages employers to be very demanding in terms of qualifications, and especially of work experience. This leads to a vicious circle, since, as more firms seek young employees with relevant experience, there is a higher risk that the employees leave the firm which trained them, and firms are less interested in investing in initial training.

Finally, the growth performance and the macroeconomic policies of the last two decades have also had a negative impact on the demand for higher education graduates. First, instead of 'catching-up' like the other less developed economies of Europe, the Greek economy experienced a deep recession between 1979 and 1994, with an average GDP growth of less than 1%. Since 1995, there has been a net improvement, but this has not been enough to change the gloomy landscape of labour markets. Second, as the private sector's demand for highly educated personnel has traditionally been low, the main employer of higher education graduates was the broader public sector. Hence, the stabilisation policies implemented since 1990 to remedy the macroeconomic imbalances of the previous decade had a greatly negative effect on the employment opportunities of young graduates.

An Oversupply of Young Graduates

The supply of higher education graduates mainly reflects the demand for higher education that has been met. The most typical feature of the strong demand for higher education is that a very large number of young people who do not succeed in entering Greek higher education study abroad. 'The number of Greek students in foreign universities between 1970 and 1982 held the world record (after Hong Kong). Foreign enrolment started to decline in 1982, reflecting perhaps the deteriorating economy and the increase in costs of European universities, especially in the UK' (OECD, 1997, p. 121). However, this decline was to be reversed in the 1990s as many foreign (especially English-speaking) universities opened local branches in Greece. These branches offer the possibility to follow the programme

TABLE III. Public expenditure per student and students per teacher in tertiary education in E.U. countries, 1997

	Total public expenditure in tertiary education per student (PPS)	Students per teacher in tertiary education
Greece	2,951	22.6
Ireland	7,207	15.0
Italy	4,289	26.7
Spain	3,389	17.8
Portugal	4,164	23.4
E.U.-15	6,381	14.5

Source: European Commission (2000).

of a foreign university in Greece for the first years and to continue the rest of the curriculum abroad.

The government on the other hand, trapped by such a spectacular demand for higher education, increased the number of entrants and created new departments, universities and technological institutes. Thus, according to recent data published by the Ministry of Education, the number of Departments increased by 40% and the number of students entering higher education by 115% between 1993 and 2002! This policy has often been denounced as demagogic by professional associations, which argue that the unemployment (or the involuntary out-of-field employment) of graduates makes the expansion of higher education completely irrational. Furthermore, as the latter took place in the context of a fiscal crisis, the ratios of public expenditure or academic staff per student have further deteriorated. As can be seen in Table III, in 1997 Greek higher education had the lowest public expenditure per student and the highest ratios of students to academic staff. Even though these data must be interpreted very cautiously because of the large number of non-active students in Southern European countries, they point to the fact that there may be a trade-off between the number of students enrolled in Greek higher education and the quality of their studies.

The increasing demand for higher education in Greece is mainly due to the growing percentage of young people who complete secondary education. It has increased from 43% in 1982 for the cohort which entered primary education in 1970 to 86% in 1997 for the 1985 cohort (OECD, 1997, p. 108; Stamelos, 1993). This dramatic increase was also caused by the institutionalisation of 9-year compulsory education in the mid-1970s and the abolition of entrance exams to upper secondary education in the early 1980s. The results of this educational policy can be seen in Table IV. Greece has the same GDP per capita as Portugal, but the percentage of the Greek population that has achieved at least upper secondary education is 2.4 times higher than in Portugal! Similarly, Greece, although clearly falling behind Ireland, Spain and Italy in terms of GDP per capita, has the highest percentage of upper secondary education attainment amongst people between the ages of 25 and 34. It must be noted, however, that this is not only because of an excessively expansive educational policy. If Greece had experienced the same growth rates as Ireland did during the last two decades, everybody would now praise Greek public policy for its long term investment in human capital.

TABLE IV. Population (%) that has attained at least upper secondary education by age group (1999)

	25-64-year-olds	25-34-year-olds
Greece	50	71
Ireland	51	67
Italy	42	55
Spain	21	30
Portugal	35	55
E.U.-15	62	72

Source: OECD (2001).

Gender, or women emancipation, was another factor leading to increasing demand for higher education, but its influence seized around the mid-1980s when the numbers of enrolled women and men were balanced. In addition, the demographic evolution (births) has not induced a growing demand for higher education because the number of births in Greece remained rather stable from 1955 to 1966 and then constantly decreased.

What is more difficult — and more interesting — to explain is the growing demand for higher education in a context of high unemployment rates for young graduates. The paradox is even greater if one takes into account the evolution of earnings differentials by level of educational attainment. This evolution, as estimated by Lambropoulos and Psacharopoulos (1992), shows that the earnings advantage of higher education was reduced by some 40% between 1975 and 1987. Moreover, a more recent study (Kanellopoulos, 1997) estimated that the wage premium of higher education/secondary education declined from 1.5 in 1974 to 1.23 in 1994.

A possible sociological interpretation of this paradox is that Greek society was traditionally characterised by relatively high social mobility based on the access to the higher levels of educational mechanisms (Tsoukalas, 1977). Perhaps, the link between the access to higher education and the social mobility in the imagery of the Greek society remains strong enough to create *inertia* in the behaviour of agents. Furthermore, easier access to secondary education in the last decades and the subsequent 'inflation' of high school diplomas have made entry to higher education the only perspective for social mobility through the educational system.

A more important explanation refers to the inner dynamics of the 'massification' of higher education. The diminishing employment opportunities of higher education graduates induce them to accept less qualified jobs and then to displace less qualified graduates. Hence, the unemployment of upper secondary education graduates raises to such levels that it makes entry into higher education the best strategy to limit the risk of being unemployed. Hence, the excessive demand for higher education becomes self-sustaining. Significantly enough, the unemployment rate of 20- to 24-year-old secondary education graduates is 34%. This is the highest in OECD for the same age group and educational attainment, and much higher than the unemployment rate of the 25-29-year-old higher education graduates in Greece (22%).⁴

Is There Structural Unemployment for Higher Education Graduates?

Following the above discussion, the fundamental problem in the Greek economy is not the inability of educational institutions to meet the needs of a skill-biased technical change but the inability of the Greek economy to keep pace with a — more or less met — strong demand for higher education. This does not mean that the Greek educational system is efficient, but that the *basic* cause for the unemployment of young graduates is to be found outside the education system.

However, in the public debate it is possible to find an alternative explanation presuming that young Greek graduates are mainly subject to a structural unemployment. According to this view, the problem could be resolved by a rational reallocation of enrolments inside the higher education system. But, to our knowledge, there is no serious empirical evidence to confirm this hypothesis. Recent studies undertaken by the newly established career offices of Greek universities show that almost all higher education young graduates suffer from unemployment. There are, of course, some exceptions which we shall analyse in the following sections. But they are negligible in comparison to the employment problems of the majority of young graduates.

It remains that there are important differences in the unemployment rates of young graduates. Science (especially social science) graduates have greater difficulty in entering the labour markets than those of applied sciences (engineers, doctors). But different rates of unemployment by no means imply the existence of serious mismatches between the specialities produced by universities and those required by the economy. The differences mainly reflect the fact that in the last few decades the faculties of sciences and social sciences received the main bulk of enrolment increase decided by the government to meet the demand for higher education.

Another version of the structural unemployment hypothesis, which was very popular in the previous decades, stressed the lack of vocational directions in both secondary and tertiary education. Much effort has been made in the last two decades to expand and upgrade vocational education. However the rapid expansion of vocational (upper) secondary and tertiary education had a disappointing effect on the unemployment risk of its graduates. Young people graduating from technical-vocational high schools have slightly better employment opportunities than holders of a 'general' high school diploma (Observatory for the Transition in Labour Markets, 1999). Similarly, the young graduates of non-university tertiary education share the same rates of unemployment as university graduates (see Tables I and II) and face the highest unemployment rates amongst OECD non-university graduates (OECD, 2000). Hence, whatever the errors or deficiencies in the planning and implementation of the corresponding educational reforms, the basic problem seems to be the mismatch between the demand and supply for highly educated workers in the Greek economy.

Job Requirements for Knowledge and Skills and Higher Education Curricula

The puzzle created by the above mismatch by no way implies that nothing must be changed in the higher education system. After all, every improvement of the existing education and training system could have a positive impact on employ-

ment through the reinforcement of the competitiveness of the Greek economy. In order to study in more detail the challenges faced by Greek higher education, the rest of the article presents some relevant findings from a field research on the National Technical University of Athens (NTUA) young graduates.

NTUA Young Graduates. An Exception inside the Greek Exception

The National Technical University of Athens is the oldest and most prestigious educational institution of Greece in the field of technology. Teaching and research activities are carried out in nine Departments: Civil Engineering, Chemical Engineering, Architecture, Mechanical Engineering, Naval Architecture and Marine Engineering, Electrical and Computer Engineering, Mining and Metallurgical Engineering, Rural and Surveying Engineering, and Applied Mathematics and Technical Physics.⁵ All degree programmes require five years of study and provide students with a variety of courses and laboratory practice. NTUA follows the continental system of engineering education offering two years of theoretical (science) courses and three years of more applied courses that require advanced knowledge in specific topics.

The findings presented in this article are based on the answers to a questionnaire by 536 NTUA graduates who received their professional licences from the Technical Chamber of Greece⁶ (TCG) between 1991 and 1995 (Laboratory of Industrial and Energy Economics, National Labour Institute, 2001). The survey was conducted by phone interviews between 20 October and 10 December 1999. The response rate was 62.9%. The sample represents 11.6% of the population under study and was chosen by random stratified sampling using the database of the TCG members. The sample's stratification was based on three parameters: department of graduation, place of residence and sex. The survey's empirical findings are supported by the results of some 80 in-depth interviews with business executives, executives from the Public Sector, TCG officers and the Chairmen of the NTUA departments.

One of the main findings of this research is the observed low rate of unemployment amongst the young NTUA graduates (2.2%). This contrasts with the perception of the unemployment of young engineers. For example, the last research conducted for TCG all over Greece showed that the unemployment rate of engineers who acquired their professional licenses during the 1990s was up to 10%. Part of this difference may be attributed to the methodologies adopted by each field research.⁷ However, this difference is probably mainly due to the fact that young NTUA graduates enter the labour market under privileged conditions compared with those of other Greek or foreign technical universities. The good reputation of NTUA is probably an important point here. Thus, to the question if they believe that the employers prefer NTUA graduates to those of other domestic or foreign universities, 44% replied 'yes', 25.6% replied 'maybe', 9.7% 'depends on the university' and 9.7% 'no'.

In order to better assess the conditions under which NTUA young graduates enter the labour market, we used a less static variable than the rate of unemployment at a given period. The research questionnaire therefore included a question on how long it took the respondents to find an employment that corresponded to their level of education (self-employed graduates were not included). The responses to this question supported the conclusion that young NTUA engineers

TABLE V. Percentage and cumulative percentage of the time spent in finding the first employment

Time spent	Percent (%)	Cumulative percent (%)
0–2 months	56.8	56.8
2,1–4 months	20.8	77.6
4,1–6 months	11.1	88.7
More than 6 months	11.3	100.0

Source: Laboratory of Industrial and Energy Economics — National Labour Institute (2001).

find their first job quite easily. As can be seen in Table V, 56.8% enter the labour market within 2 months, whilst 88.7% need less than 6 months to find their first employment. Thus, despite the divergence observed between the mean (3 months) and the median (2 months), the rapid entry in the labour market is an outstanding achievement of the young NTUA graduates, especially if one takes into account the general unemployment problem of Greek graduates.⁸

Suggestive of the favourable employment conditions of NTUA graduates is that the correlation between the time spent to enter the labour market and their income is statistically insignificant. Thus, the differences in the time spent to find employment do not seem to have an impact on their subsequent professional advancement.

Knowledge and Skills Required of Engineers Today

The evidence above suggests that NTUA's young graduates enjoy a privileged position in the labour markets. It remains now to be seen how far this can be attributed to the superiority of the NTUA curricula. We therefore made a distinction between five domains of knowledge and skills required of engineers today:

- The scientific-theoretical background
- The technical knowledge related to the subject of the diploma
- The use of specialised computer applications
- The acquisition of a basic background in economics and management
- The development of skills, and especially of non-technical skills

The importance of the first two domains for engineering education is self-evident and remains unchangeable over time. The importance of specialised computer applications is also obvious. What deserves further comments are the two last domains.

It is worth noting that knowledge of economics and business management has always been a prerequisite for the evolution of an engineer in managerial positions within an organisation. However, in the last two decades there have been two major changes in the profile and employment of engineers at an international level. The first is closely related to the realisation that the strict division of labour between technical and socio-economic problems is harmful for both economic units and society at large. In addition, the continuous complexity and increasing uncertainty of modern techno-economic systems have made the classic engineer profile out-of-date. In order to respond to changing requirements, most technical universities in

advanced countries have modified their curricula by upgrading not just the courses in economics and management, but also in social sciences in general.⁹

The second change observed in the engineers' employment is that they find non-technical positions at the beginning of their career. Several hypotheses have been developed to explain this phenomenon. It is suggested, for example, that in periods of great technological restructuring, even exclusively managerial positions require a privileged relation with technology. Moreover, the increasing application of scientific knowledge and new technologies in managerial tasks has given engineers an advantage over the graduates of the faculties of economics and business. Admittedly, one cannot predict whether this phenomenon has a temporary or a more permanent nature. For example, it would be unrealistic to assume that the faculties of economics and business will not restructure their programmes to close the gap with technical universities. Thus, a relevant study for Canada (Lavoie & Finnie, 1998) proved that the higher salaries offered to young engineers in managerial positions in the 1980s no longer apply in the 1990s. Regardless of the difficulties in predicting the demand for engineers in managerial positions, there is an apparent increase in the number of young engineers employed in such positions.

The crucial role of skills in engineering education is also an important change in the last two decades. Today, the pattern of the technical university which aims to transfer as much knowledge as possible is considered out-of-date.¹⁰ On the one hand, the obsolescence of knowledge is so rapid that it tends to coincide with the time needed for its transfer. On the other, the boundaries between the different areas of engineers' specialisations are becoming increasingly vague. The diffusion of computer technology in all technical or non-technical areas and the emergence of new interdisciplinary areas of employment (i.e. environment) seem to be the fundamental causes for the blurring boundaries between the traditional engineering disciplines. In this environment, skills have a significant precedence over knowledge. Amongst the preferred required skills are analytical thought, adaptability, capability to learn how to learn, initiative in taking decisions, etc. Moreover, the adoption of new organisation methods (e.g. project management, customisation) by firms and the expansion of the services relations and of the economic / managerial responsibilities in the engineers' work (Liaroutzos & Robichon, 1999; Panitz, 1996), have significantly upgraded a series of non-technical skills which until recently were considered of minor importance. These are the capacity to communicate and cooperate, to negotiate and write reports (Jansen, 1998; Robar, 1998; Silyn-Roberts, 1998).

How Adequately Are the Required Knowledge and Skills Provided by the NTUA?

The questionnaire asked the graduates to assess their level of studies in the NTUA in the five domains analysed above. They had to attribute a score ranging from 1 (low level) to 4 (excellent level).

The results showed both the excellence of NTUA regarding its scientific background and its weakness in providing technical knowledge. But, above all, it was confirmed that the main weakness of NTUA does not apply to technical knowledge but to the new fields of knowledge and skills which became important in the last two decades. More concretely, the factor analysis applied to the assessment of the NTUA studies extracted two factors which explain the 60.5% of the cumulative variance. The first contains two variables, which represent the

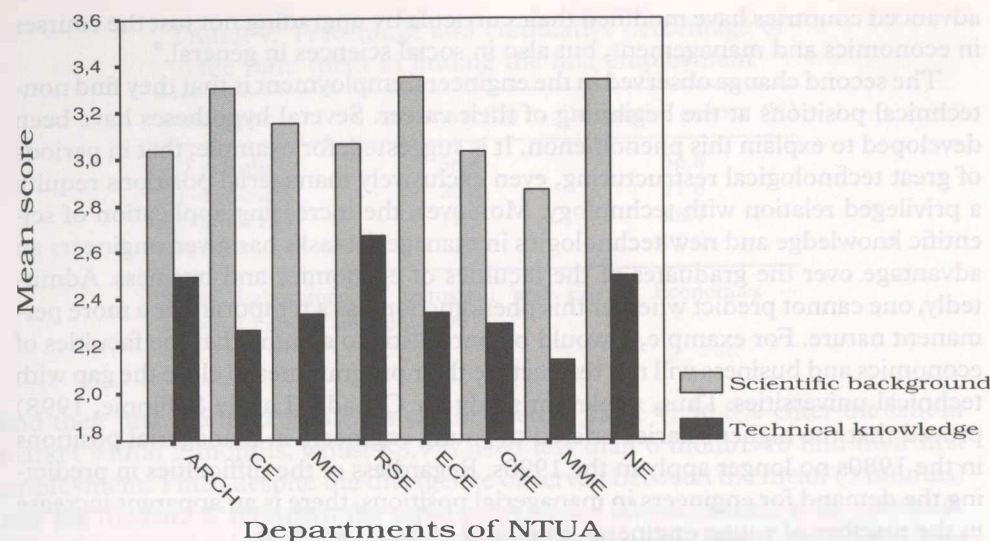


FIGURE 1. Assessment of the NTUA concerning the provided scientific background and technical knowledge

ARCH, architecture; CE, civil engineering; ME, mechanical engineering; RSE, rural and surveying engineering; ECE, electrical and computer engineering; CHE, chemical engineering; MME, mining and metallurgical engineering; NE, naval engineering.

traditional model of continental engineering education: the scientific-theoretical background and technical knowledge. The second includes three variables which are related to the transformation in the engineers' profile. As can be seen in Figure 2, there is clear contradiction between the high mean score with which the first factor is rated (traditional areas) and the relatively low mean score connected with the second factor (new areas). It also seems that there are significant differences between the NTUA departments (see also Figure 2) concerning the evaluation of the second factor: the engineers employed in the construction sector (civil engineers, architects) are the most dissatisfied with the level of studies in the new areas of knowledge and skills. This could reflect the difficulties of the more traditional departments of NTUA to adapt their curricula to the changing needs of the Greek construction industry.

Finally, given the weakness of NTUA in the new fields of knowledge and skills, how can one explain that its graduates are well positioned in the labour markets? First, it must be noted that the graduates of technical universities and schools of medicine have more favourable employment prospects than the rest of the tertiary education graduates. The applied character of these Faculties does not permit excessive growth of enrolments (imposed by the government). Second, the fact that NTUA is the first technical university established in Greece and, moreover, in Athens, operates as a filter for the selection of the best academic staff and students. As NTUA clearly precedes the other technical universities in the preferences of candidate students, the simple fact that a student has entered NTUA constitutes a positive signal for the employer. Third, it might be suggested that no other Greek technical university provides the knowledge and skills in which

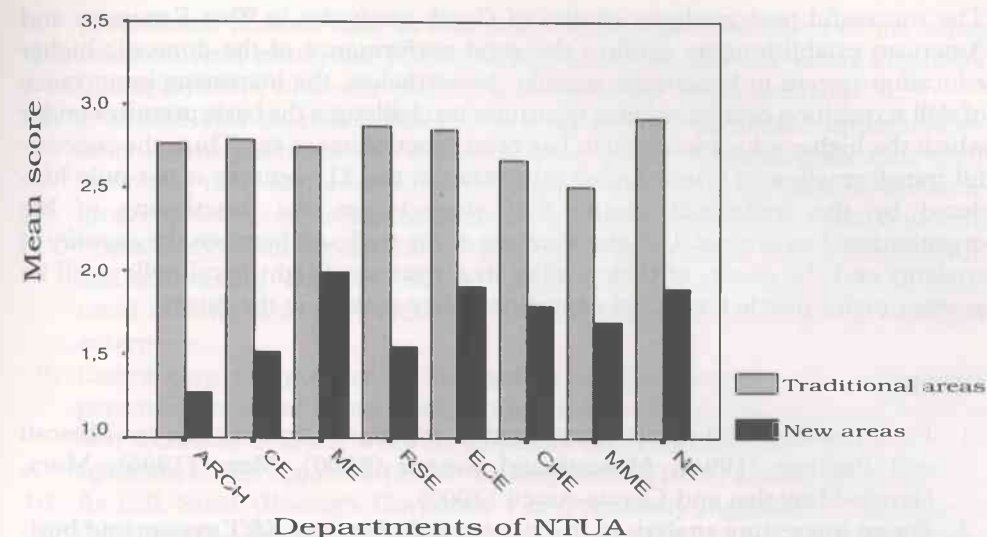


FIGURE 2. Assessment of the NTUA concerning the traditional and new areas of knowledge and skills

NTUA is deficient. The provision of training in specialised computer applications, and even more in skills, is not at all evident in Greek higher education. This kind of training requires innovative methods of teaching, which means, *amongst other things*, low ratios of students to staff and relatively high ratios of expenditure per student. Unfortunately, these conditions are rather difficult to find today even in Greek technical universities.

Conclusion

The discussion above can be divided into three conclusions. The first is that Greece does not seem to follow the international trends concerning the unemployment of low-skilled and high-skilled workers. The main cause for this can be found in the mismatch between the spectacular demand for higher education and the relatively weak demand of the Greek economy for highly qualified workers. This calls into question the appropriateness of the transfer of the European Union's human capital policy patterns to the case of Greece. It also questions some positions which impute the high rates of graduates' unemployment to the inner organisation of higher education.

The second conclusion is that, even though the basic cause for the low performance of the Greek economy is to be found outside the education system, there is place for improvement in the functioning of higher education. Our findings suggest that even some of the most prestigious Greek universities (in this case the NTUA) have adapted rather slowly to the new demands of the economy.

The third conclusion is that the satisfaction of social demand for higher education becomes increasingly 'dangerous' for the ability of Greek universities to perform in a context of a deep structural change. Until now, besides all the criticisms formulated against the functioning of the Greek university (Pesmazoglu, 1994; OECD, 1997), the latter has been rather efficient in transmitting knowledge.

The successful post-graduate studies of Greek graduates in West-European and American establishments confirm the good performance of the domestic higher education system in knowledge transfer. Nevertheless, the increasing importance of skill acquisition over knowledge transmission challenges the basic premises under which the higher education system has been functioning so far. Thus, the successful transformation of Greek higher education in the 21st century is not only hindered by the traditional inertia that characterises the functioning of big organisational structures. The management of the trade-off between the *quantity* of students and the *quality* of their studies in a context of tight fiscal policy will be another major puzzle for higher education policy-makers in the future.

NOTES

1. For an analysis of the Italian and Spanish experience on this topic see Moscati and Pugliese (1996), Moscati and Rostan (2000), Mora (1996), Mora, Garcia-Montalvo and Garcia-Aracil (2000).
2. For an interesting analysis of the missing links between S&T system and business sector in Greece, see Deniozos (1997).
3. For example, the Zambarloukos and Constantelou (2002) study on ICT skills in Greece shows that 'in general, skill shortages appeared where work experience was considered a prerequisite for the job. The high value placed on work experience by many of the firm representatives interviewed stemmed, in part, from the fact that they could not provide sufficient opportunities to their employees to learn on the job' (p. 244).
4. Glytsos (1990) offered an alternative explanation for the persisting strong demand for higher education in Greece, based on the role of the State in the Greek economy and society: 'Job security, lifetime relative higher income and other benefits offered by government employment (which absorbs the great majority of graduates) in conjunction with the traditional social distinction associated with its graduate status, has induced a strong demand of education. (...) In such circumstances, it is no wonder that the response of students to these incentives is strongly in favour of the general areas of law and social sciences, without particular attention to more specific educational fields. The resulting volume of graduates exercises, in its turn, high economic and political pressures, forcing the government to succumb and to absorb as many of them as possible, creating, in effect, in volume and quality, its own demand' (p. 398). If this explanation was right, the stopping of recruitments in the public sector and the squeezing of the wages of civil servants since 1990 should have induced an important decrease in the demand for higher education. But, this is far from being true. Besides, in the last decades students preferred medicine, engineering, and management and not social sciences and economics.
5. This department was established recently and is therefore not included in the research.
6. The Technical Chamber of Greece is a professional organisation that serves as the official technical adviser of the State and is responsible for awarding professional licenses to all practising engineers in Greece.
7. The sample of the TCG study includes engineers who obtained their professional license between 25 November 1996 and 20 January 1997. On the contrary the sample of this research included NTUA graduates who received their

professional licenses nine to four years before the conduction of the actual research. As a result, the TCG research 'overestimates' the young engineers' unemployment, while the present study probably 'underestimates' it.

8. It should also be noted that this is a statistically significant differentiation amongst the graduates of the NTUA departments concerning the time spent in finding their first employment. Chemical engineers and mining-metallurgical engineers are having the greatest difficulties (mean time 5 and 6 months respectively). This seems rather logical given the crisis of Greek manufacturing and mining. But the crisis in Greek shipyards does not seem to affect naval architects, as they are employed and very well rewarded by maritime enterprises.
9. Concerning the position of humanities in the technical universities' programmes, see Conférence des Grandes Ecoles (1996). For the importance of non-technical courses, with an emphasis on economics and business management, see E. Spjøtvoll (1994) G. Bugliarello (1996) and B. Panitz (1996).
10. As E.B. Stear (Boeing's Corporate Vice-President) suggests: '... no 4-years (or 5- or 10-years) university program is ever going to be able to produce a fully and permanently qualified engineer, and thus ... efforts to cram 'everything a student must know into this time frame is futile' (E.B. Stear, 1996, p. 159).

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