GRIT PROJECT

The Demand and Supply of Skills in Greece

Mannheim, 9th and 10th of July

Center of Economic Research and Environmental Strategy (CERES)

I.   Introduction

A review of the empirical literature for Greece on the topics of *growth, inequality* and *training* provides evidence for the inability of domestic institutions in science, industry and government to promote innovative activity. The dominance of traditional means of industrial production and the degradation of vocational training have led to a low-tech, cost-oriented, non-competitive industry, currently threatened by the newly industrialized countries of cheaper labor and/or high-tech orientation, in addition to the pressures invoked by the process of European unification.

However, these are merely observations supported by sets of independent research efforts examining the general overlapping factors of growth, inequality and training in the Greek realm. There have been few attempts to systematically analyze the *interrelationship* between technical change, wage (income or earnings) dispersion, the demand and supply of skilled labor and economic performance.

From our previous survey we may recall that studies on the macroeconomic factors of growth in the Greek economy give mention to the inherent handicaps of industry and public policy which surfaced with the liberalization of national transactions (Georgakopoulos, 1995; Hassid and Katsos, 1992; Katsoulacos et al., 1996; Lianos, 1995; Tsakalotos, 1998). Taking into account the rising importance of technical change in the global market, these factors may imply the incompetence of domestic industry to respond changes in the technological and competitive environment.

Additionally, studies on (income) inequality in Greece state that the most important factor in explaining the reduction of aggregate inequality during the period 1974 - 1994 was the level of education of the household head (Mitrakos and Tsakloglou, 1998; Tsakloglou, 1993). Education opportunities became widely spread within the Greek population providing thus for a considerable source of higher wages and living standards for all. However, the impact of the reduction of inequality on social welfare and growth was moderated by a social policy directed solely to nominal wage increases (Katrougalos, 1996). It was also moderated by a national education and training system unable to supply the workforce with the technical skills demanded by a high-tech private industry (Stavrou 1992; Tsiotras et al., 1997). The result was worsening industrial competitiveness and rising unemployment amongst higher - education graduates.

Finally, studies on the role of science and technology in the Greek realm point to the poor technological infrastructure of the country and the ineffectiveness of both public policy and corporate strategy in coordinating the innovative orientation of production (Katsoulacos et al., 1996; Kazis and Skoumal, 1985; Korres, 1996; Papadogonas, 1998; Rekleitis, 1998). These studies use a history of irrational and scattered policy measures and short-term behavior of Greek entrepreneurs to explain the low level of technological capabilities in Greece. Some proceed to empirical research to portray the weak relationship between industrial productivity or economic growth with R&D effort at the firm level.

Nevertheless, further research needs to be undertaken in order to investigate the specific relationships between growth, inequality and training in Greece. In particular, it is necessary to investigate the trend in the wage dispersion and the share of skilled and unskilled labor in industry. The trend observed throughout the developed world in the past two decades is the worsening of labor market outcomes of less-skilled workers, despite their increasing scarcity relative to the rapidly expanding supply of skilled labor. Shifts in wage and employment structures have favored more-skilled workers, especially in countries such as the US and UK, compared to continental Europe (Machin and Van Reenan, 1998). Similar trends have been observed in developing countries as well (Berman et al., 1998). The increasing wage dispersion in the developed countries has been linked to product demand and international trade, according to a Heckscher - Ohlin framework of international product specialization. However, this hypothesis finds weak theoretical and empirical support in the relevant literature (Berman et al., 1998). Much of the change in skill and wage structure in these countries stems from the impact of new skill-biased technology. Evidence of a significant complementarity of human capital and new technology, especially in computer-intensive sectors, is uncovered in international empirical research. These hypotheses should be tested

for Greece in the light of suspected trends of increased inequality and shifts towards more-skilled labor.

Testing such hypotheses for the Greek realm would require an acceptable model of industrial performance to include country specific characteristics, and a pool of indicators to measure technical change and the net demand of skills in the economy. The latter may pose certain difficulties due to the lack of historical and disaggregated data for Greece. Below we shall state the data available for measuring the demand and supply of skills for Greece.

II.   Supply of Skills in Greece

Data for the supply of skills in Greece can be found in the *Workforce Surveys* of the National Statistical Service of Greece. The *Workforce Surveys* include tables on the distribution of the Greek workforce - employed and unemployed - according to individual characteristics of workers, amongst which the *educational level, the occupational position* and *the production sector of employment[1]*.

In this section, we provide a rough statistical overview of the supply of skills in Greece and its implications for the impact of the national education and training system on wage inequality and growth. Of course, it has been noted that each country has a different perception of what is a high, medium and low education level, dependent on the specific features of the national education system, the distinction chosen by statistical surveys and, not to mention, the cultural and social norms determining the value of education. For the country of Greece, the distinction viewed in the *Workforce Surveys* has been adjusted as follows (TABLE 1):

TABLE 1: Definition of Educational levels for the country of Greece

High	- Post-graduates - Bachelor's graduates
Medium	- Attendants of a higher education institution (AEI) who never received a degree - Graduates of post-secondary institutions / technical vocational schools - Higher secondary level graduates *(lykeio)* - Lower secondary level graduates *(gymnasio)*
Low	- Primary level graduates *(demotiko)* - Attendants of primary level schools who never received a certificate - Never had schooling

---

[1] Information on the specific educational levels, occupational positions and sectors of production distinguished by the *Workforce Surveys* are provided in APPENDIX B.

The overall trend[2] in the supply of skills in Greece during the period 1981 - 1997 (for which the *Workforce Surveys* produce data) reveals a sharp fall in the share of low-skilled workers, paired with an increase in the share of medium-skilled workers and, more moderately, of high-skilled workers (GRAPH 1 and 2). This trend is much more evident in the case of women (GRAPH 2), which can be explained by the fact that the initial pool of educated women in the first post-war period (1955 - 1974) was much lower than that of men. Thus, the expansion of educational opportunities allowed more women to conquer higher levels of education in the second post-war period (1975 - 1997) in a much greater rate than men.
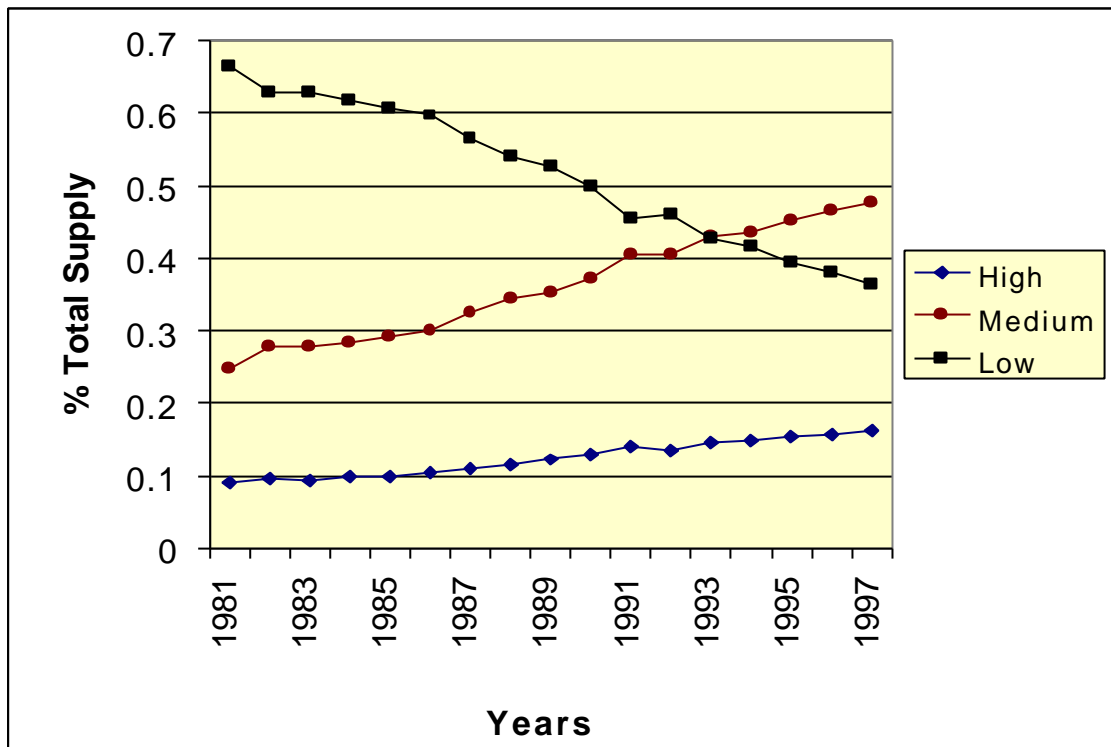
GRAPH 1: Men (16 - 65 years of age): Shares by Skill Level (in Total Workforce)
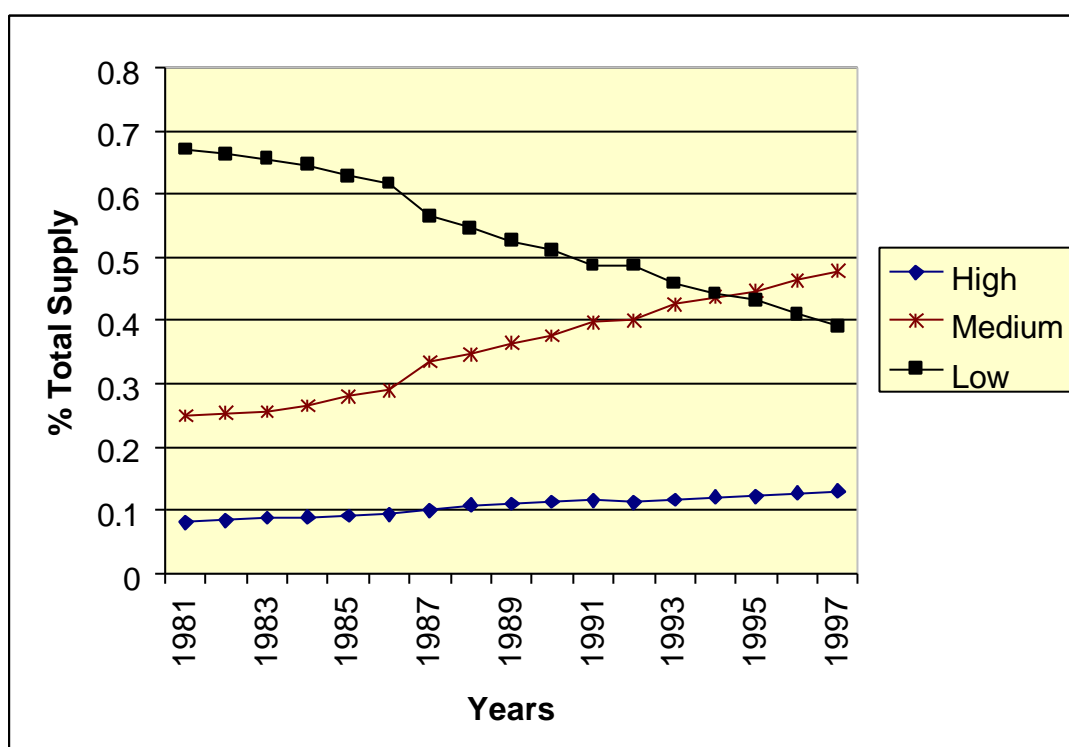
Source: Workforce Surveys (1981 - 1997), National Statistical Service of Greece.

---

[2] Numerical values of the change in absolute supply for several sub-periods are given in APPENDIX A.
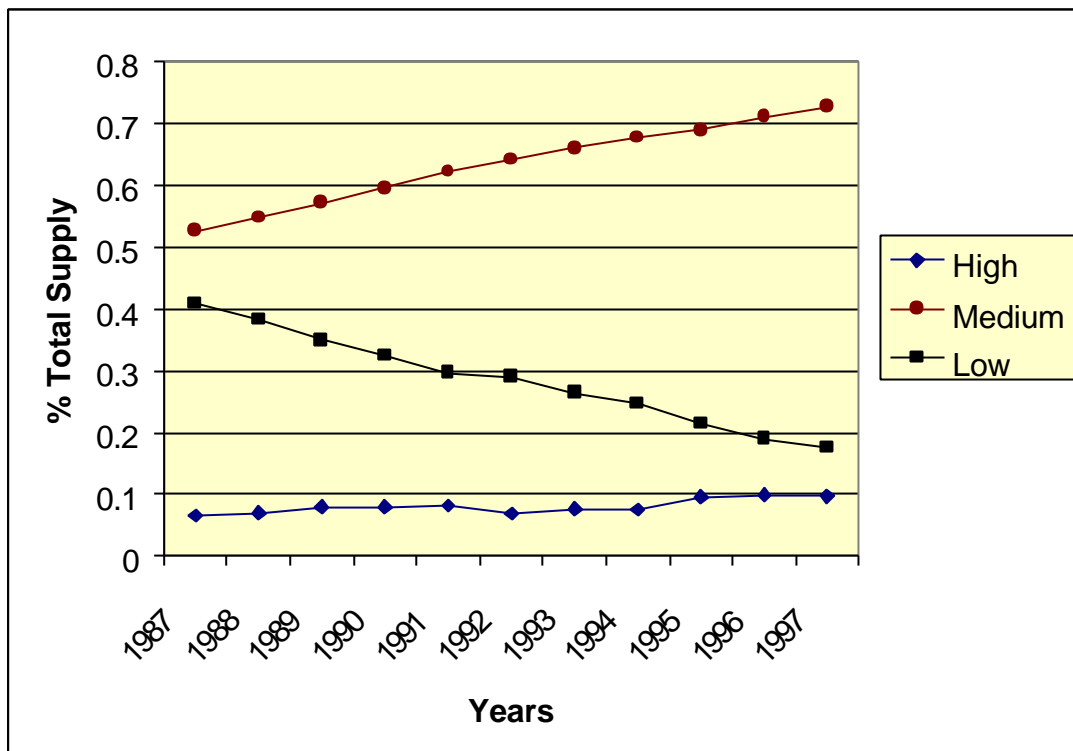
GRAPH 2: Women (16 - 65 years of age): Shares by Skill Level (in Total Workforce)
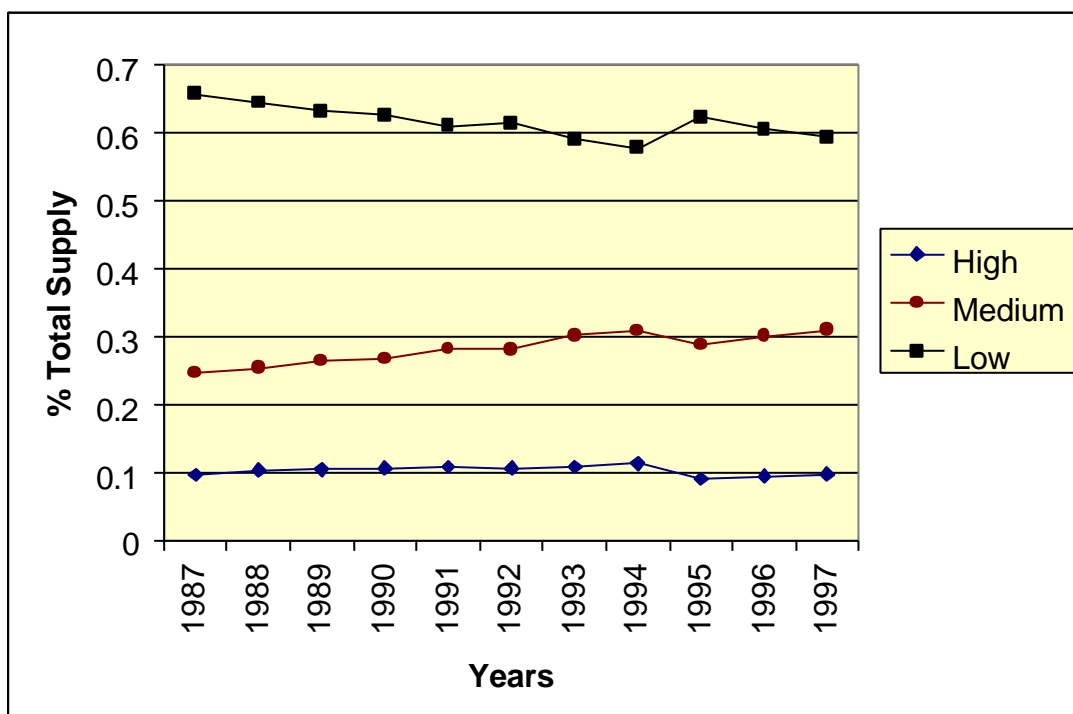

Source: Workforce Surveys (1981 - 1997), National Statistical Service of Greece.

If we examine the trend in the share of employed skilled workers within the male population for those under 30 and over 30, we observe that the share of medium-skilled workers is above that of low-skilled and high-skilled workers, with an increasing trend, for men under 30. However, for men over 30 (GRAPH 3), i.e. men whose secondary and tertiary education opportunities were in the '50s, '60s and '70s, this is reversed as the share of medium-skilled workers is below that of low-skilled workers and above high-skilled workers, although it is rather stable through time (GRAPH 4). This features the increase in the educational level of new entrants in the labor force, perhaps as a response to a shift in the market demand towards higher quality skills (although the unemployment figures for medium- and high- skilled labor do not correspond to a significant shift in demand for skills, which may in turn reveal the technological backwardness of domestic industry).

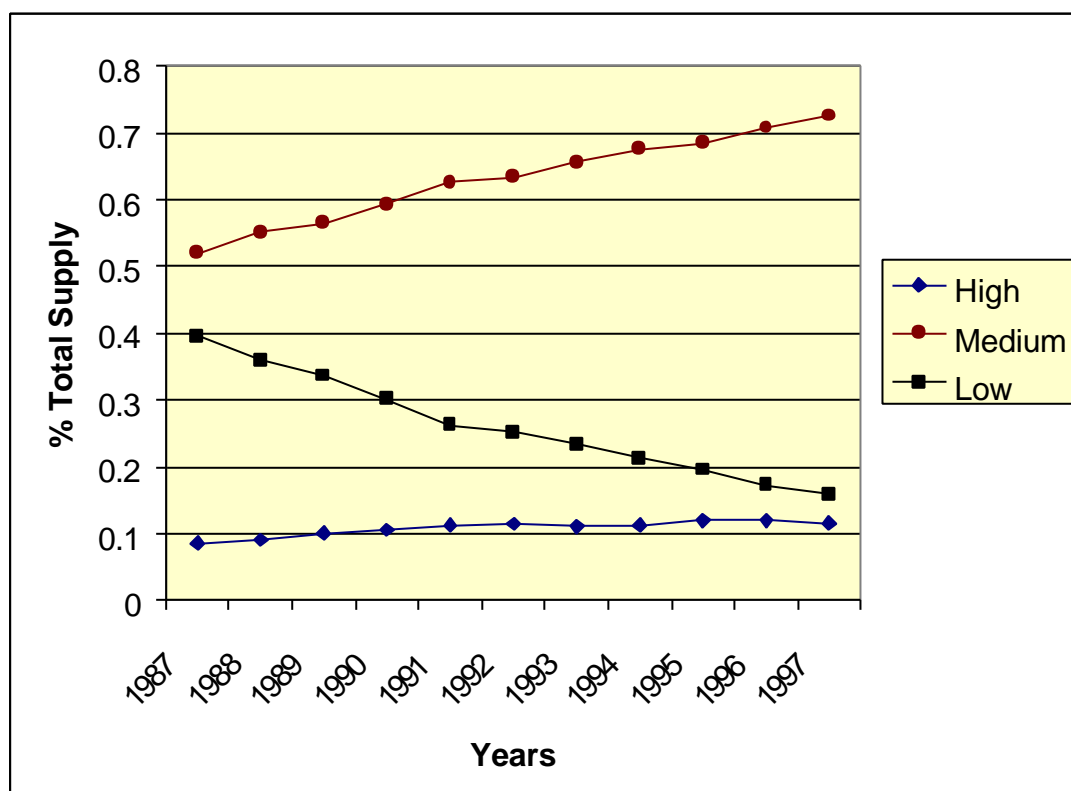**GRAPH 3: Employed Men Under 30: Shares by Skill Level (in Total Employment)**

GRAPH 4: Employed Men Over 30: Shares by Skill Level (in Total Employment)

Source: Workforce Surveys (1987 - 1997), National Statistical Service of Greece.

Similar conclusions are drawn if we examine the trend in the share of employed skilled workers under 30 and over 30 within the female population (GRAPH 5 and 6). What is worth noting in the case of women is the fact that the share of employed high-skilled men over 30 is slightly greater than that of women over 30 throughout the period 1987 - 1997, with a tendency to converge to 10%. This relationship is reversed if we compare the share of employed men and women under 30. The difference may seem insignificant but it may be signalling factors such as the limited education opportunities of women in the past, and the conditions of balancing career and childbearing obligations (a factor determined by the structure of the family as well as social policy). The latter factor may appear more evident in the share of employed low-skilled women over 30, which, unlike that of men over 30, declines throughout the period in question. This share may be replaced by more medium-skilled female workers, but given a rather steady rate of high-skilled employed women it may mean that other factors such as family obligations or economic slowdown create further motives for the unskilled women to exit the market. These are hypotheses that should be further tested.

GRAPH 5: Employed Women Under 30: Shares by Skill Level (in Total Employment)

Source: Workforce Surveys (1987 - 1997), National Statistical Service of Greece.
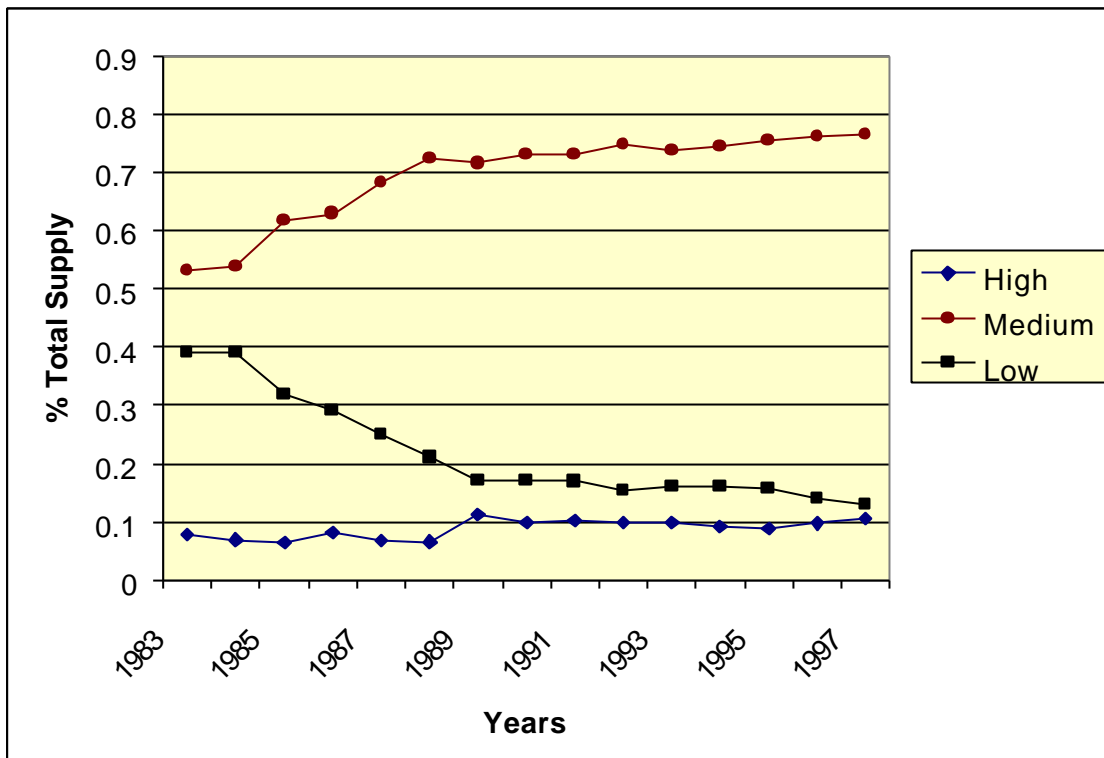
GRAPH 6: Employed Women Over 30: Shares by Skill Level (in Total Employment)
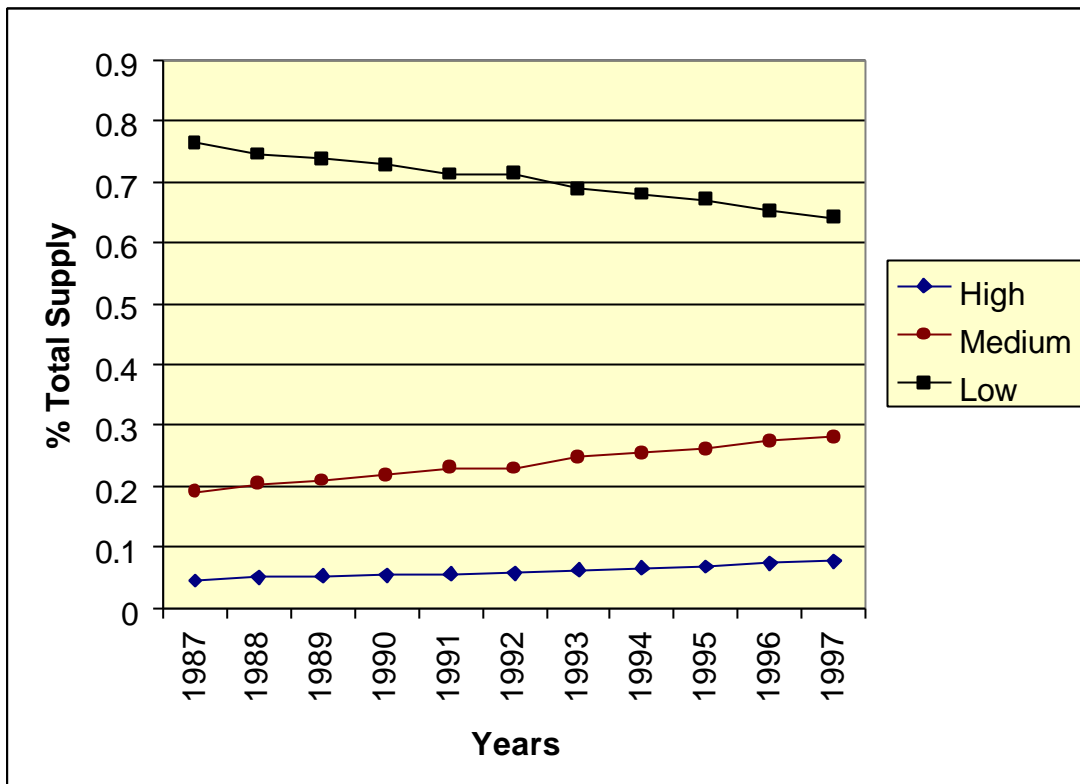
Source: Workforce Surveys (1987 - 1997), National Statistical Service of Greece.

Finally, we examine the trend in the share of unemployed skilled and unskilled men and women. Data on the share of unemployed provides information about the interaction of supply and demand of skills in the market and, thus, gives a better insight of the contribution of demand shifts to the skill structure prevailing in the country of Greece. First we shall analyze the trend in the share of unemployed skilled men under and over 30. The element that stands out in both graphs (GRAPH 7 and 8) is the decrease in the share of unemployed low-skilled workers and the increase in unemployed higher-skilled workers, especially of medium-skilled workers. This lends support to the view that the education reforms promoted by the governments of the past 15 years have expanded education opportunities but have not supplied the younger workforce with the appropriate technical skills that will assure them of employment opportunities.

GRAPH 7: Unemployed Men Under 30: Shares by Skill Level (in Total Unemployment)

GRAPH 8: Unemployed Men Over 30: Shares by Skill Level (in Total Unemployment)
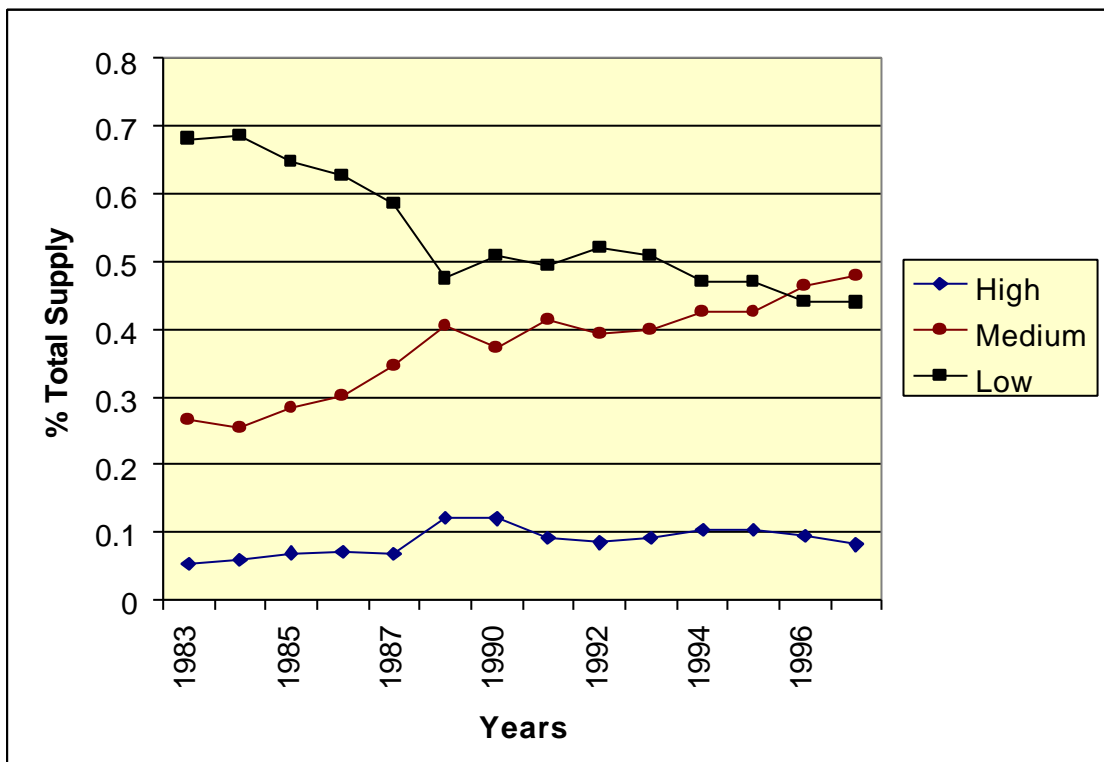
Source: Workforce Surveys (1983 - 1997), National Statistical Service of Greece.

Particularly the increase of the unemployed medium-skilled men under 30 after the mid-1980s may convey to the ineffectiveness of the introduction of the integral multidisciplinary lykeio[3] in 1986. The general lykeio, attended by over 73% of the higher secondary level pupils, provided general, theoretical knowledge, not adjusted to the practical and technical skills required in the labor market. Thus, the integral lykeio was established in 1986 so as to 'integrate' theoretical and practical knowledge and, therefore, to offer the economy a skilled workforce with the flexibility to respond to the demands of high-tech sectors. However, it appears that the education and initial training of higher secondary schools altogether did not suffice to ensure their graduates of a job position in accordance to market demands. This problem expands to tertiary (public) education institutions in Greece, which have been accused of not providing university graduates with the skills needed to enter the labor market. But the unemployment situation of the latter is less worse than the former. Thus university studies become the sole alternative for higher secondary school graduates to secure more favorable employment and wage conditions. On the whole, the data may confirm the weak links between the school system and the labor market and the resultant skill vacancy of industry.

On the other hand, the increasing share of the unemployed medium-skilled men over 30 may proclaim the ineffectiveness of the continuous training system in Greece. Regardless of domestic - private and public - initiatives supported by European Community funding, continuous vocational training in Greece has many weaknesses[4]. It is called upon to function as a supplement to insufficient initial education and perform operations beyond its specialized role.

The trend of unemployed skilled and unskilled workers in the female population is similar to that of men (GRAPH 9 and 10). A notable difference is the initial high share of unemployed medium-skilled women and the lower share of low-skilled unemployed women under 30 compared to that of men under 30. The break in GRAPH 10 between the years 1992 and 1994 in all three levels of education may reveal the effect of the 1991 recession as medium- and high- skilled female workers, with more favorable employment opportunities than low-skilled workers, re-enter the labor market in their effort to increase family earnings.

---

[3] We remind readers that in Greece the *lykeio* is the higher secondary level of schooling. For more details on the structure of the Greek Educational System, readers may consult the previous survey prepared by the CERES group for the purposes of the GRIT project's second meeting in Milan (17/18 April 1999).
[4] See previous survey prepared by the CERES group for the purposes of the GRIT project's second meeting in Milan (17/18 April 1999).

GRAPH 9: Unemployed Women Under 30: Shares by Skill Level

(in Total Unemployment)
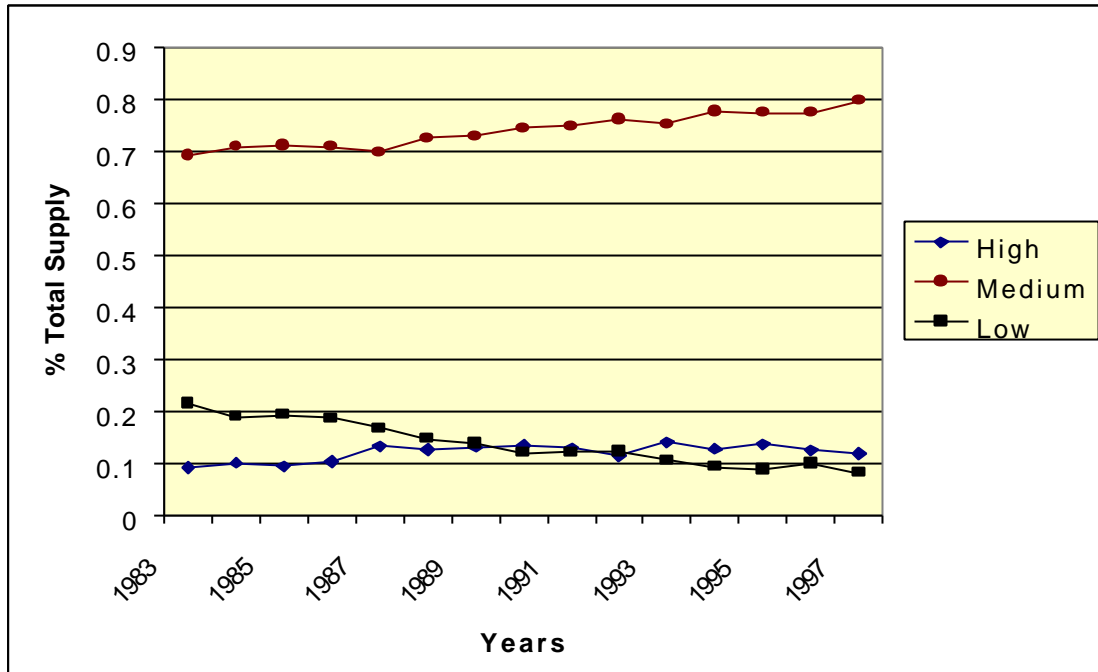
GRAPH 10: Unemployed Women Over 30: Shares by Skill Level

(in Total Unemployment)
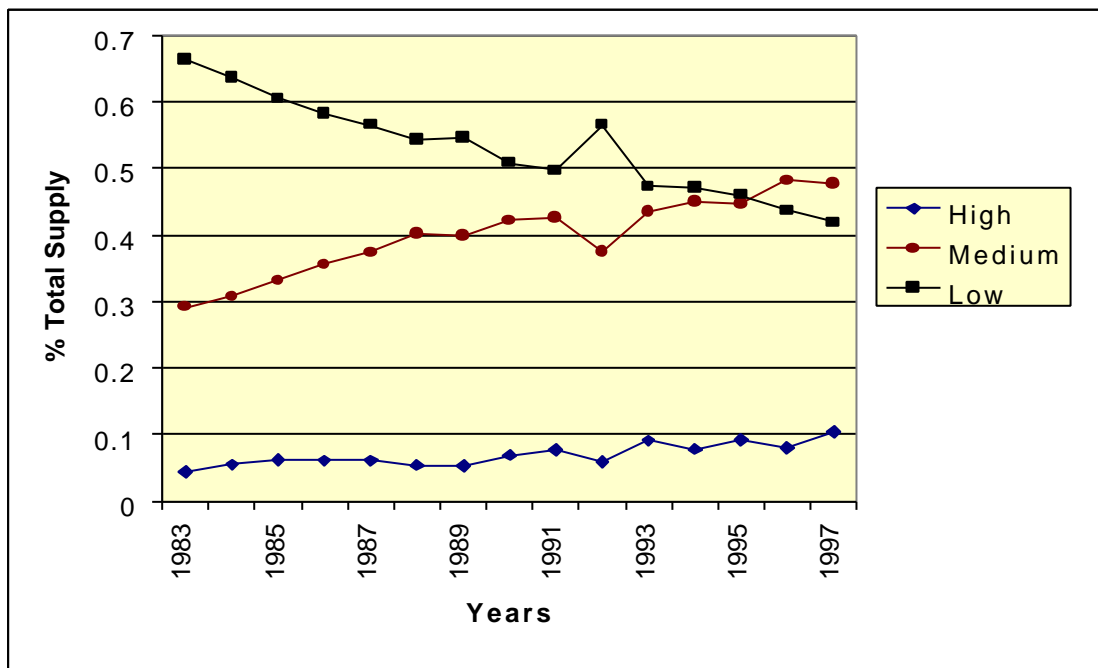
Source: Workforce Surveys (1983 - 1997), National Statistical Service of Greece.

GRAPH 11: Unemployment Rate by Skill Level
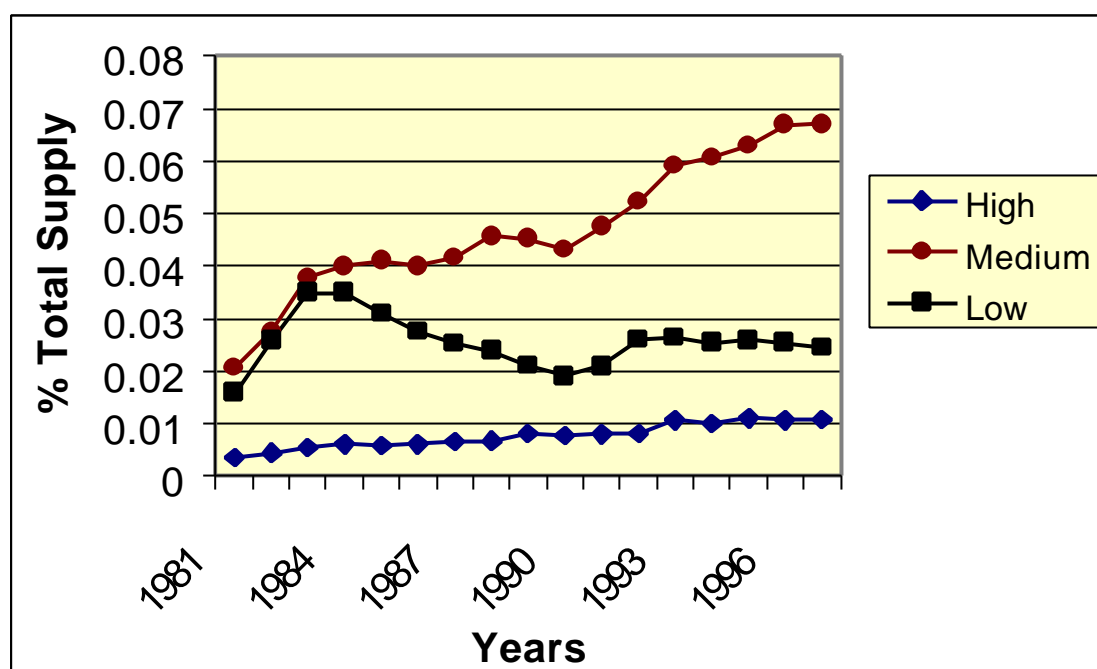
Source: Workforce Surveys (1981 - 1997), National Statistical Service of Greece.

The weaknesses in the national system of education and vocational training and its inability to secure employment opportunities may be confirmed by the evolution of the unemployment rate of skilled and unskilled labor (GRAPH 11). According to GRAPH 11, from 1983 onward, the unemployment rate of medium-skilled workers has an increasing trend, as well as that of high-skilled workers, although at a much lower rate. An explanation for the decreasing trend in the unemployment rate of low-skilled workers may be the expanding educational opportunities within the Greek population.

In GRAPH 12 we take the fraction of unemployed *X*-skilled workers to total supply of *X*-skilled within the total workforce (where *X* = high, medium or low), rather than taking the fraction of unemployed *X*-skilled workers to the total workforce as in GRAPH 11. We observe an increasing trend in *all* three subgroups of workers. Of course, the share of unemployed in the medium-skilled subgroup is much greater than that of the two other subgroups throughout the time period in question. We also note the cyclical behavior in the evolution of this indicator, so it may additionally be capturing economic shocks affecting the unemployment of all workers regardless of skill level.

GRAPH 12: Share of Unemployed in Subgroups of High-, Medium-, and Low- Skilled
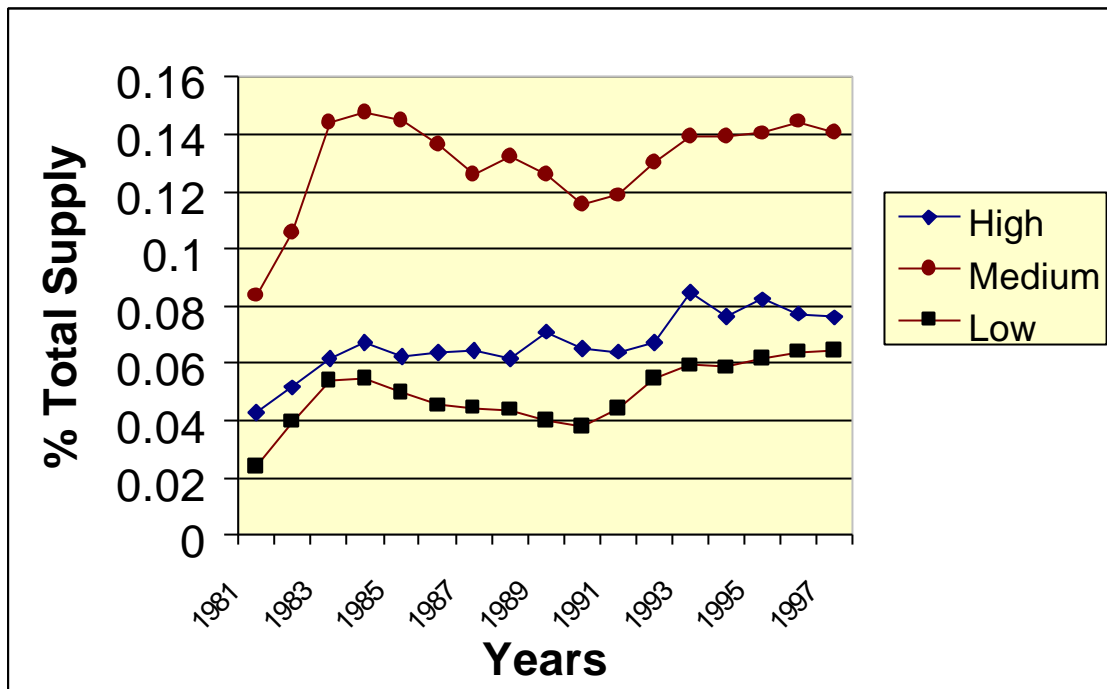
Source: Workforce Surveys (1981 - 1997), National Statistical Service of Greece.

However, the increase in the unemployment rate of medium-skilled and high-skilled labor observed in both GRAPHS 11 and 12 may be a result of modest shifts in the demand for skilled labor. That is, it may not only be a result of an incompetent national education system, but also of the inability of the traditional infant industry to absorb skilled human capital. On the other hand, shifts in the relative demand for medium- to high- skilled labor may reveal the effect of new technology in some sectors of the economy which render the skills obtained at the secondary educational level obsolete. The demand of skills in Greece will be described in the following section.

III. Demand for Skills in Greece

Data for the demand of skills in Greece can be found in the *Census of Industry, Handicraft and Commerce* and the *Statistical Surveys of Industry* of the National Statistical Service of Greece. As described in APPENDIX B, these sources include data on the total number and earnings of workers employed by industry. Workers are distinguished between salary-earners

and wage-earners which offers the best proxy to relevant distinctions used by other countries between production and non-production workers, or manual and non-manual workers.

This data may finally be coupled with data on R&D activities at the sectoral level in order to explore hypotheses of the effect of skilled-biased technology change and the degree of complementarity between human capital and technology within the Greek realm. Such a study would shed light on the nature and role of science and technology in domestic industry, in comparison with international trends of technology oriented production and the upgrading of skills. These findings may in turn be coupled with information on the institutional organization of the labor market in determining the wage and skill structure. Indices of science and technology are mainly provided by the General Secretariat of Research and Technology and the National Statistical Service of Greece. Details on the level of aggregation and time span for which this data is available are described in APPENDIX B.

IV.   Conclusions

The international trend observed is that labor market outcomes of less-skilled workers have worsened in the past two decades, despite their increasing scarcity relative to the rapidly expanding supply of skilled labor (Berman et al., 1998). The data presented in this brief report for the country of Greece provide input for in-depth empirical research on the effect of technological change on the structure of the demand and supply of skills for the country of Greece.

The internationally observed trend of wage inequality and unemployment of unskilled workers may reveal the lag in educational and training institutions to incorporate and adjust to technical change, compared to the needs of the market for technology-intensive goods, which in turn creates a demand for skilled human capital. This lag may be greater where there are no social institutions to enhance cooperation between educational institutions and the market, i.e. there is no social capital between academia and industry, trainers and firms.

APPENDIX A: Supply of Skills in Greece

In the following tables we describe the change in the supply of skills in Greece for several sub-periods and individual characteristics of members of the workforce such as gender and age. The tables include the average supply of low-, medium- and high- skilled workers, relative to the total workforce, total employment and total unemployment, as stated accordingly in each table. The change in supply has been calculated as the difference of the average relative supply of two consecutive sub-periods.

TABLE 1: Men - Population working age: Change in supply (in total workforce)							
	av(81-85)	av(86-90)	av(91-95)	av(96-98)	ch(2 - 1)	Ch(3 - 2)	ch(4 - 3)
	1	2	3	4			
Education level							
High	0.0863	0.1046	0.1171	0.1284	0.0183	0.0125	0.0113
Medium	0.2606	0.3423	0.4213	0.471	0.0817	0.079	0.0497
Low	0.6528	0.5529	0.4613	0.4004	-0.0999	-0.0916	-0.0609

TABLE 2: Women - Population working age: Change in supply (in total workforce)							
	av(81-85)	av(86-90)	av(91-95)	av(96-98)	ch(2 - 1)	ch(3 - 2)	ch(4 - 3)
	1	2	3	4			
Education level							
High	0.095	0.1161	0.1444	0.1586	0.0211	0.0283	0.0142
Medium	0.2757	0.3382	0.4251	0.4701	0.0625	0.0869	0.045
Low	0.629	0.5455	0.4302	0.3711	-0.0835	-0.1153	-0.0591

TABLE 3: Employed men under 30 - Population working age: Change in supply (in total employment)					
	av(87-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)
	1	2	3		
Education level					
High	0.0735	0.0795	0.0981	0.006	0.0186
Medium	0.56	0.6577	0.7189	0.0977	0.0612
Low	0.3662	0.2625	0.1829	-0.1037	-0.0796

15

TABLE 4: Employed men over 30 - Population working age: Change in supply (in total employment)

	av(87-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)
	1	2	3		
Education level					
High	0.1027	0.1048	0.0957	0.0021	-0.0091
Medium	0.2577	0.2919	0.305	0.0342	0.0131
Low	0.6394	0.6029	0.5991	-0.0365	-0.0038

TABLE 5: Employed women under 30 - Population working age: Change in supply (in total employment)

	av(87-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)
	1	2	3		
Education level					
High	0.0955	0.1142	0.118	0.0187	0.0038
Medium	0.5568	0.6547	0.7164	0.0979	0.0617
Low	0.3474	0.2309	0.1654	-0.1165	-0.0655

TABLE 6: Employed women over 30 - Population working age: Change in supply (in total employment)

	av(87-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)
	1	2	3		
Education level					
High	0.0505	0.0619	0.0754	0.0114	0.0135
Medium	0.2054	0.2447	0.2774	0.0393	0.0327
Low	0.7438	0.6932	0.6471	-0.0506	-0.0461

TABLE 7: Unemployed men under 30 - Population working age: Change in supply (in total unemployment)

	av(83-85)	av(86-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)	ch(4 - 3)
	1	2	3	4			
Education level							
High	0.0705	0.0851	0.0967	0.1006	0.0146	0.0116	0.0039
Medium	0.5629	0.696	0.7424	0.7635	0.1331	0.0464	0.0211
Low	0.3664	0.2186	0.1606	0.1357	-0.1478	-0.058	-0.0249

TABLE 8: Unemployed men over 30 - Population working age: Change in supply (in total unemployment)

	av(83-85)	av(86-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)	ch(4 - 3)
	1	**2**	**3**	**4**			
Education level							
High	0.0606	0.0915	0.0954	0.0884	0.0309	0.0039	-0.007
Medium	0.2678	0.358	0.412	0.4715	0.0902	0.054	0.0595
Low	0.6714	0.5502	0.4924	0.4399	-0.1212	-0.0578	-0.0525

TABLE 9: Unemployed women under 30 - Population working age: Change in supply (in total unemployment)

	av(83-85)	av(86-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)	ch(4 - 3)
	1	**2**	**3**	**4**			
Education level							
High	0.0955	0.1252	0.1299	0.1223	0.0297	0.0047	-0.0076
Medium	0.7054	0.7226	0.7641	0.7871	0.0172	0.0415	0.023
Low	0.1988	0.152	0.1058	0.0904	-0.0468	-0.0462	-0.0154

TABLE 10: Unemployed women over 30 - Population working age: Change in supply (in total unemployment)

	av(83-85)	av(86-90)	av(91-95)	av(96-97)	ch(2 - 1)	ch(3 - 2)	ch(4 - 3)
	1	**2**	**3**	**4**			
Education level							
High	0.0541	0.0601	0.0798	0.0925	0.006	0.0197	0.0127
Medium	0.3104	0.3903	0.4266	0.4796	0.0799	0.0363	0.053
Low	0.6353	0.5493	0.4932	0.4277	-0.086	-0.0561	-0.0655

APPENDIX B: Indices of Educational Level, Occupational Status and Technical Change

INDICES OF EDUCATIONAL LEVEL	SOURCE OF DATA	LEVEL OF AGGREGATION	TIME SERIES
Number of those employed as: • Post-graduates • Bachelor's graduates • Attendants of a higher education institution (those referred to as *AEI*) who have not received their degree • Graduates of post-secondary institutions / technical vocational schools • Higher secondary level graduates *(lykeio)* • Lower secondary level graduates *(gymnasio)* • Primary level graduates *(demotiko)* • Attendants of primary level schools who have not received their certificate • Never had schooling	*Workforce Surveys,* National Statistical Service of Greece	• National • Regional • Sectoral (at the 1 - digit level) *NOTE:* The 1 - digit sectoral distinction involves 9 different sectors: • Agriculture, stockbreeding, fishery • Mining • Manufacturing, handicraft • Electricity, gas • Construction and public contract work • Trade, restaurants, hotels • Transportation, communication • Banks, insurance companies • Other services • Did not declare	1981 - 1997 (annual)

INDICES OF OCCUPATIONAL STATUS	SOURCE OF DATA	LEVEL OF AGGREGATION	TIME SERIES
Number of those occupied as: • Entrepreneurs • Participating family members • Employees / Salary-earners • Workers / Wage-earners	*Census of Industry, Handicraft and Commerce,* National Statistical Service of Greece *NOTE:* This data source also contains information on the level of nominal wages and salaries.	• National • Regional • Sectoral (at the 3 - digit level)	1920 - 1988 (every 3 years)
Number of those occupied as: • Salary-earners • Wage-earners *NOTE:* Older publications include the category *'Entrepreneurs and Participating family members'.*	*Statistical Surveys of Industry,* National Statistical Service of Greece *NOTE:* This data source also contains information on the level of nominal wages and salaries.	• National • Regional • Sectoral (at the 3 - digit level)	1958 - 1995 (annual)
Number of those occupied as: • Scientists • Managers • White-collar workers • Merchants • Services • Farmers • Technicians • None of the above	*Workforce Surveys,* National Statistical Service of Greece	• National • Sectoral (at the 1 - digit level)	1974 - 1997 (annual)

INDICES OF TECHNICAL CHANGE	SOURCE OF DATA	LEVEL OF AGGREGATION	TIME SERIES
S&T Activities of Firms			
S&T research expenditure of firms	_Indices of R&D (1997),_ General Secretariat of research and Technology	• National • Regional (13 regions) • Sectoral (at the 2 - digit level)	1986, 1988, 1989, 1991, 1993 _NOTE:_ Data for 1995 will be available at the end of the present year.
Research expenditure for new products	National Statistical Service of Greece	• Sectoral (at the 3 - digit level) _NOTE:_ The survey includes firms with more than 20 employees.	1982 - 1991 (annual) _NOTE:_ Data for R&D activity for the year 1997 will be available at the end of the present year.
Number of researchers in industry by: • Function (Researchers, Technicians, Support Staff) • Level of education (PhD, PhD candidates, MSc, BA, Secondary level education, Primary level education)	_Indices of R&D (1995, 1997, 1999 unpublished),_ General Secretariat of Research and Technology.	• National • Regional (13 regions) • Sectoral (at the 2 - digit level) _NOTE:_ Sectoral data are only available for the _'Function'_ factor. Regional and sectoral data are not available for either factor after 1991.	1986, 1988, 1991, 1993 _NOTE:_ Data for 1995 will be available at the end of the present year.
S&T Activities of Public Research Institutes			
S&T research expenditure of public research institutes (excluding tertiary educational institutions)	_Indices of R&D (1995, 1997, 1999 unpublished),_ General Secretariat of Research and Technology.	• National • Regional (13 regions) • Institutional (29 research institutions)	1986, 1988, 1989, 1991, 1993, 1995

S&T research expenditure of tertiary educational institutions	*Indices of R&D (1995, 1997, 1999 unpublished),* General Secretariat of Research and Technology.	• National • Regional (13 regions) • Institutional (20 institutions)	1986, 1988, 1989, 1991, 1993, 1995
Number of researchers in public research institutes (including tertiary educational institutions) by: • Function (Researchers, Technicians, Support staff) • Field of scientific research (Social, Positive, Mechanical, Geo-technical, Medical) • Level of education (PhD, PhD candidates, MSc, BA, Secondary level education, Primary level education)	*Indices of R&D (1995, 1997, 1999 unpublished),* General Secretariat of Research and Technology.	• National • Regional (13 regions) • Institutional (49 institutions) *NOTE:* Regional data are available only for the *'Function'* factor (except for the year 1993). Institutional data are available for the *'Function'* and *'Level of education'* factor.	1987, 1989, 1991, 1993, 1995
S&T Activities of the State			
S&T research expenditure funded by the State	*Indices of R&D (1995, 1997, 1999 unpublished),* General Secretariat of Research and Technology	• National • Regional (13 regions)	1980 - 1996 (annual)
Training programs for employees (unemployed) of private firms by: • Number of trained employees/unemployed • Amount of EU funding • Amount of private and public (OAED) funding • Total cost in Greek drachmas, current prices	OAED	• National	1990 - 1994 (annual)

REFERENCES

Berman, Eli; Bound, John and Stephen Machin (1998), 'Implications of skill-biased technological change: International evidence', *The Quarterly Journal of Economics,* November, pp. 1245-1279.

Georgakopoulos, Theodore (1995), 'The Macroeconomic Imbalances of the Economy', in *2004 - The Greek Economy Just Before the Turn of the 21st Century*, ed. Andreas Kintis, The Ionian Bank, pp. 85-147 (in Greek).

Hassid, J and G. Katsos (1992), *European Unification and Greek Industry - Structure, Performance and Prospects*, Institute of Economic and Industrial Studies (IOVE), Series for the Greek Economy and European Unification, Athens (in Greek).

Katrougalos, George (1996), 'The South European welfare model: The Greek welfare state in search of an identity', *Journal of European Social Policy*, Vol. 6, No. 1, pp. 36-60.

Katsoulacos, Y.; Tsounis, N.; Kanela, K. and P. Tsonopoulos (1996), *The Role of Science and Technology for Regional Development: The Applied Side - The Case of Greece*, Center of Economic Research and Environmental Strategy (CERES), September.

Kazis, D. A. and S. Skoumal (1985), *Innovation in Greek Manufacturing - Role of Advanced Technologies and New Management Outlook*, Center of Planning and Economic Research, Series of Studies 15, February.

Korres, George M. (1996), *Technical Change and Economic Growth - An empirical Analysis of the EEC*, Perspectives on Europe - Contemporary Interdisciplinary Research, Avebury Ashgate Publishing Limited.

Lianos, Theodore (1995), 'The Evolution of the Basic Aggregates of the Greek Economy in the Post-War Period', in *2004 - The Greek Economy Just Before the Turn of the 21st Century*, ed. Andreas Kintis, The Ionian Bank, pp. 85-147 (in Greek).

Machin, Stephen and John Van Reenan (1998), 'Technology and changes in skill structure: Evidence from seven OECD countries', *The Quarterly Journal of Economics,* November, pp. 1215-1245.

Magoula, Theoharoula and Kyprianos P. Prodromidis (1999), 'Education and Economic Growth in Greece', *Department of Economics*, *Athens University of Economics and Business*, Discussion Paper No. 102, February.

Mitrakos, Theodore and Panos Tsakloglou (1998), 'Changes in Aggregate Inequality and Poverty in Greece after the Change in the Polity', *Department of Economics, Athens University of Economics and Business*, Discussion Paper No. 97, July (in Greek).

Papadogonas, Theodore A. (1998), *R&D Expenditure in the Greek Industry*, Ph.D. Doctorate Thesis, Department of European and International Economic Studies, Athens University of Economics and Business (in Greek).

Rekleitis, Panagiotis (1998), *Innovation and Competitiveness: The Case of Greek Industry*, Ph.D. Doctorate Thesis, Laboratory of Industrial and Energy Economics, Department of Chemical Engineering, National Polytechnic University of Athens (in Greek).

Stavrou, Stavros (1992), *Vocational Training in Greece*, CEDEFOP - European Center for the Development of Vocational Training, Thessaloniki.

Tsakalotos, Euclid (1998), 'The Political Economy of Social Democratic Economic Policies: The PASOK Experiment in Greece', *Oxford Review of Economic Policy*, Vol. 14, No. 1, pp. 114-137.

Tsakloglou, Panos (1990), 'Aspects of Poverty in Greece', *Review of Income and Wealth*, Series 36, No. 4, December, pp. 381-402.

Tsakloglou, Panos (1993), 'Aspects of inequality in Greece - Measurement, decomposition and intertemporal change: 1974-1982', *Journal of Development Economics*, V. 40, pp. 53-74.

Tsakloglou, Panos (1999), 'Poverty and Anti-Poverty Policies in Greece and a Comparison with other Mediterranean EU Member-States', *Department of International and European Economic Studies, Athens University of Economics and Business*, January.

Tsiotras, George; Syriopoulos Constantinos; Georgopoulos, Nikolaos; Patrinos George and Stylianos Zantanidis (1997), *Education and Industrial Competitiveness*, Vrontos H. D. & Com. Ltd., Special Studies of General Interest - The Future of Greek Industry, Thessaloniki (in Greek).