CENTRE OF PLANNING AND ECONOMIC RESEARCH

No 54

Demographic Changes, Retirement, Job Creation and Labour Shortages in Greece: An Occupational and Regional Outlook

by

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May 1996

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CONTENTS

1. INTRODUCTION*

Two supposedly disturbing but seemingly complementary developments concern deeply the Greek society in recent years, one is the rapid deceleration of natural population growth, soon to be negative, and the other is an accelerated inflow of migrants into the country. This paper undertakes to investigate the impact of demographic changes on the Greek labour supply and the likely labour shortages that may thereof ensue. The possibility that such shortages, may be filled by the new migrants, despite rising Greek unemployment, will also be examined.

The analysis is disaggregated by occupation (two digit code) and region (13 major regions) to account for the wide regional differences in natural population growth and in occupational structures of employment and for assessing their impact on corresponding labour imbalances. The paper takes a long-term view, searching labour supply and labour requirements until the end of the century. The multi-dimensional character of the problem at hand, referring to the country, regions and occupations, necessitates a methodology simple enough to be compatible with the serious limitations imposed by the available data and flexible enough to fit the different levels of the analysis.

The time period of demographic and economic changes of the past as a basis for future evaluations varies. National output and productivity refer, for reasons of uniformity with the future horizon of the analysis, to the period 1973-1989, demographic changes refer to the 1981-1991 decade, whereas regional data are limited to the 1988-1991 short period.

Severe limitations are imposed in the application of the usual approach of forecasting the future on past developments. This is because there are great differences in the nature and the extent between past developments and foreseeable future changes on demography, migration and interregional and international labour mobility. Particularly constraining are the short-period 1988-1991 regional data that deprive the analysis from a more comprehensive picture of regional changes, considering in addition that 1988 was a year with some modest growth of output and employment whereas 1991 was a rather recession year.

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* This paper draws heavily on a major study (in Greek), concerning the insertion into the Greek labour market of Greek Pontians from the ex-Soviet Union and of Second World War Greek refugees to Eastern Europe returning home. To the Ministry of Foreign Affairs (General Secretariat for Greeks Abroad) which financed the study, I express my gratitude.

2. DEMOGRAPHIC LABOUR SUPPLY

Natural population growth has been decelerating continuously since the 1950s, but the rate has actually tumbled in the very recent years. In 1990, the number of births was 102,000, down from 148,000 in 1980, with a modest increase in the number deaths from 87,000 to 94,000 in the same period. As a result, the number of children of up to 14 has decreased, for the first time, at an annual average rate of 4.7 per thousand, and the whole population has substantially aged. Some recent estimates[1] give a gloomy picture for the future, with a population for the year 2001 of 10,108,000, down from 10,212,000 in 1991, assuming zero net migration. Youth of up to 14 will be 15.5% of total population, down from 18.7% in 1991, and the aged over 65 will be 16.7% up from 14.0% in 1991.

Natural population growth varies between -3.7% and 4.0% among regions, in the period 1981-1991, with a 2.9% average for the country (Table 1). Most of the regions had however a net inflow of population, but no distinction can be made between external and internal migration. These natural population changes have been largely affected by the different pressure of regional emigration of the 1960s and early 1970s. It has been observed that regions (prefectures) with rapid economic growth have experienced much lower emigration than regions with a slow growth.[2] The aging of the population differs also considerably between regions.

Today, about 40% of the productive age population (15-64), especially women, are not in the labour force, and the proportion is relatively high for young and for educated persons. This economically nonactive part of the population may include discouraged workers, early retirees, or workers in the paraeconomy (officially nonactive but really active), all of which constitute a source of potential labour supply. In fact, there are some indications that in several regions, labour force and employment are positively associated. This means that there is a portion of the population, mostly women, that are in and out of the labour market, in accordance with job availability.[3]

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[1]. See Papadakis and Siambos, 1993.

[2]. See Glytsos, 1988, pp. 75-79.

[3]. Intertemporal association between employment and population of working age is also found elsewhere, e.g. in the United Kingdom. The explanation given is that employment is positively affected by population pressure (see Beenstock and Warburton, 1982, pp. 254-255).

TABLE 1

Demographic Changes by Region in Greece, 1981-1991

Regions	Population		Population Change (%) 1981-1991	Natural Population Change (%) 1981-1991	Inflow (+) or Outflow (-) of Population (%) 1981-1991	Share of Population over 65 Years of Age (%) 1981
	1981	1991				
Eastern Macedonia and Thrace	575,100	574,300	-0.2	2.2	-2.4	12.4
Central Macedonia	1,602,900	1,729,600	7.9	3.2	4.7	10.9
Western Macedonia	289,000	292,700	1.3	3.8	-2.5	13.5
Epirus	324,500	339,200	4.5	2.1	2.4	14.1
Thessaly	695,500	731,200	5.1	2.9	2.2	12.7
Ionian Islands	182,600	191,000	4.6	-2.1	6.7	18.6
Western Greece	655,100	702,000	7.1	3.3	3.8	13.8
Central Greece	537,900	578,900	7.6	0.8	6.8	15.0
Attica	3,369,200	3,522,800	4.5	4.0	0.5	10.7
Peloponnese	577,000	605,700	5.0	-1.3	6.3	18.0
North Aegean	195,000	189,500	-2.8	-3.7	0.9	22.0
South Aegean	233,500	262,500	12.4	4.0	8.4	13.5
Crete	502,300	537,000	6.9	3.8	3.1	15.0
Greece	9,739,600	10,256,400	5.3	2.9	2.4	12.7

Source: NSSG, *Population Census,* 1981, 1991 (rounded figures).

The labour force proper is today about 4 million, 2.5 men and 1.5 women, and it has been rising, in the last decade, by 1% per annum, combining a zero growth rate of males and 2.9% of females. Male youth (15-24) was growing at 1.8% and female youth at 2.3% annually in this period.[4]

The impact of demographic changes on the future labour supply, which is our concern in this paper, is measured by calculating the new entry in the labour force of the lowest age bracket 15-24 years of age. Thus, the new entrants, during the period 1991-2001, will come from those born between 1977 and 1986 and survive to become 15-24 in the year 2001. For those born in 1977, the mortality must be calculated for every year of the period 1977-2001, whereas for those born in 1986, the mortality must be calculated for every year of the period 1986-2001, and analogously, for those born in the years in-between. The more recent available death rates of 1989 for the age brackets 1-24, 1-19 and 1-14 are used as benchmark figures for interpolating for all ages concerned. In algebraic notation,

$$Z_{2001} = \sum_{t=1}^{10} (1-d_t)\, B_t$$

where

Z_{2001} = the accumulated number of survivals in the year 2001 from the newly born during the period 1977-1986,

B_t = the number of births in year t, and

d_t = the percentage of deaths (average) of those born in year t to the year 2001

t = 1,2,...,10 (1977-1986)

The number of deaths of the new entrants so determined for the country as a whole, is then distributed to the 13 regions, on the basis of their share on the number of total births of the 1977-1986 period. The survivals in each region r in the year 2001 (Z^r_{2001}) are then obtained by

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[4]. See Glytsos, 1992, p. 10.

$$Z^{r}_{2001} = \left(\frac{B^{r}_{77-86}}{B_{77-86}} \right) Z_{2001}$$

where B^{r}_{77-86} and B_{77-86} are, respectively, the accumulated number of births of region r and of the country, during the period 1977-1986. This is to assume that the regions are not differentiated with respect to the death rates of the youth.

In a last stage, the accumulated new entrants in the year 2001 by region (L^{r}_{2001}) are calculated by applying the corresponding 15-24 age specific regional participation rate[5] (p_r), of the year 1991 that is,

$$L^{r}_{2001} = p_r \, Z^{r}_{2001}$$

The figures obtained are given below in Table 2 along with the estimated exit from the labour force.

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[5]. The assumption of a constant participation rate, not only for the 15-24 age bracket, but for the total population is adopted here in order to isolate the impact of demographic changes on labour supply. This assumption is also made in cases of forecasting overall changes in the labour force, when one wants to know the individual contribution of demographic factors or activity rates (see, for instance, *Employment Gazette*, 1992, pp. 174-175).

3. RETIREMENT

The exit from the labour force by occupation and region for various reasons, i.e. pension, death, marriage of women, illness, migration, etc., is affected by occupational and regional age structures. The methodology used for calculating respective exits proceeds iteratively in a top-down manner from aggregate to disaggregated figures as follows. Noting the country's labour force of the age bracket ρ in time t (1981), becoming $\rho+10$ in time $(t+10)$ (1991), in occupation i, as

$$L_{it}^{\rho} \quad \textit{and} \quad L_{i(t+10)}^{\rho+10}$$

the corresponding exit for any reason (X_i^{ρ}) during the decade will be,

$$X_i^{\rho} = L_{i(t+10)}^{\rho+10} - L_{it}^{\rho}$$

and as a proportion (x_i^{ρ}) of the respective labour force of year t (L_{it}^{ρ}),

$$x_i^{\rho} = \left(X_i^{\rho} \,/\, L_{it}^{\rho}\right)$$

For example, the workers of $\rho=45$-64 years of age in 1981 in professional and technical occupations are $L_{it}^{\rho} = 91{,}000$ and those of $\rho+10=55$-74 in 1991 are $L_{i\,(t+10)}^{\rho+10} = 37{,}000$. The exit, during the period 1981-1991, is then -54,000 (=37,000-91,000), which is 59.3% = (37,000-91,000)/91,000 of the 1981 figure.[6]

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[6]. For professional and technical, clerical, and production workers, the net exit starts from the 30-44 (in 1981) age bracket, whereas for other occupations from the 45-64 age bracket.

Summing for all age brackets, the exit by occupation (X_i) is obtained[7] as,

$$X_i = \sum_{\rho} X_i^{\rho}$$

and in proportion to the labour force of the occupation,

$$x_i = (X_i / L_{it})$$

The exit by occupation i in each region r is then calculated for the period 1991-2001, by applying the estimated overall (for all ages) percentage exit by occupation, to the corresponding 1991 regional employment by occupation, assuming, in effect, that the age composition of one-digit occupational groups is the same in all regions.[8] That is,

$$X_{ir} = x_i L_{ir}$$

The total exit by region for all occupations,[9] during the period 1991-2001, and with a small adjustment for the 1991-2000 reference period, is given by

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[7]. Some make two kinds of corrections, namely, for cyclical changes through time and for changing participation rates (see Willems and de Grip, 1993, pp. 178-179). We have not done such corrections, first because years 1981 and 1991, on which the calculations of national retirement are based, are in a similar economic state, second given the aim of this paper, i.e. to determine the impact of demographic changes on the size of the labour force, participation rates should stay constant.

[8]. The lack of employment data on occupations and regions by age does not permit the application, as others have done, of the national age-specific fallout ratio to the corresponding regional age brackets by occupation (see Berendsen, de Grip, Wieling and Willens, 1992, pp. 8-9).

[9]. An alternative and perhaps more common way for estimating future labour supply is to project labour force participation rates by region and age bracket and apply them to a corresponding projection of population. This practice could not be applied in our short period 1988-1991 regional data. Neither could the nationwide age-specific participation rates of 1981 and 1991 be projected and applied uniformly to all regions. This would be to ignore the particular conditions of employment, education and production structures by region, which differentiate participation rates even for the same age-brackets and same gender.

$$X_r = \sum_i X_{ir}$$

One step further, and the exit by two-digit occupation j and by region r (X_{ijr}) is calculated on the basis of the 1991 breakdown of the one - digit occupation by region (L_{ijr}/L_{ir}), i.e.,

$$X_{ijr} = X_{ir}\left(\frac{L_{ijr}}{L_{ir}}\right)$$

The overall results for each region (all occupations) together with the new demographic entry to the labour force as estimated earlier, are presented in Table 2 below, and the estimated figures by two-digit occupation and by region in Table A1.

According to these calculations, in 11 out of the 13 regions, labour force will decrease in the period 1991-2000, and in the other two will slightly increase. This is because the exit overrides the entry, as a consequence of the fact that earlier generations outnumber by far present generations in the labour force.

TABLE 2

Exit from and Entry to the Labour Force by Region during the Period 1991-2000

Regions	Exit 1991-2000 (1)	Entry 1991-2000 (2)	Labour Force 1991 (3)	Increase (+) or Decrease (-) of the Labour Force 1991-2000 (4) = (2)-(1)	Labour Force 2000 (5) = (3)-(1)+(2)
Eastern Macedonia and Thrace	34,627	32,419	244,875	-2,208	242,667
Central Macedonia	107,265	66,473	656,559	-40,792	615,767
Western Macedonia	16,320	16,951	105,417	631	106,048
Epirus	15,481	13,979	106,853	-1,502	105,351
Thessaly	39,571	33,175	268,067	-6,396	261,671
Ionian Islands	11,600	8,807	74,108	-2,793	71,315
Western Greece	36,764	33,588	255,571	-3,176	252,395
Central Greece	28,180	22,512	194,462	-5,668	188,794
Attica	261,209	159,046	1,428,085	-102,163	1,325,922
Peloponnese	33,917	26,305	222,468	-7,612	214,856
North Aegean	10,635	9,220	65,347	-1,415	63,932
South Aegean	16,466	12,784	85,670	-3,682	81,988
Crete	28,503	29,791	201,427	1,288	202,715
Total of Greece	640,538	465,050	3,908,909	-175,488	3,733,421

Sources: -NSSG, *Labour Force Survey*, 1981, 1991.
-NSSG, *Statistical Yearbook of Greece* (various issues).
-K. Kanellopoulos, *Human Resources*, KEPE, May 1993, mimeo (in Greek).

4. JOB CREATION

4.1. Recent Developments

During the period 1981-1991, the Greek economy was in a recessionary regime, with only some breaks of upswings in 1985, 1988 and 1989. Non-agricultural output (excluding rents) was rising at an annual average rate of 2.0%, non-agricultural employment at a rate of 1.4% and productivity at a rate of 0.6%. Due, however, to the rather high withdrawal from agriculture, of 276,000 workers, Greece's overall employment has only slightly increased, by 0.3% per annum.

The service industry was par excellence, the big creator of new jobs, amounting to 404,000, whereas the secondary sector lost 22,000 jobs. Construction, which was usually a high growth sector and an important source of new job creation, lost also in this period 47,000 jobs. But industry, in contrast to most European countries, still created 18,000 new jobs, at a very low annual rate of 1.2%. At the same time, the paraeconomy was flourishing[10], raising actual job creation to a higher figure than the official statistics show, accommodating and a large proportion of the increasing volume of illegal immigrants in Greece.

At the regional level, against an overall slightly falling employment, during the 1988-1991 period, for which, as we noted, regional data are available, employment decreased much faster than the national average in 10 of the 13 regions. Secondary sector employment fluctuated widely among regions, rising in 8 and falling in 5 of them. All regions but one have however experienced a rising employment in the tertiary sector, averaging an annual growth rate of 2.6%, for the country as a whole (Table 3).

Regarding occupational employment, the highest number of new jobs was created in professional and technical occupations (128,000), with second clerical workers (112,000), followed by sales workers (90,000) and service workers (60,000) (Table 4). This raised considerably the shares of these occupations, against mostly farmers, and to a lesser extent administrative and managerial workers and also production and related workers.

Going down to more detailed occupations, we may observe that 52 two-digit occupations experienced new job creation, and 34 occupations job destruction. New jobs have been created in 7 high labour absorbing occupations, employing each more than 100,000 workers nationwide and representing 43% of total non-agricultural employment. In contrast, jobs have been eliminated in many of the occupations with 50,000-100,000

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[10]. Kanellopoulos, 1990.

Table 3

Employment by Region, 1988 and 1991

Regions	Number of Employed Persons		Change of Employment 1988-1991	Average Annual Rate of Change (%) (1988-1991)		
	1988	1991		All Sectors	Secondary	Tertiary
Eastern Macedonia and Thrace	226,301	231,447	5,146	0.7	1.1	4.9
Central Macedonia	623,315	616,776	-6,539	-0.3	-0.2	3.2
Western Macedonia	94,031	97,087	3,056	1.1	-0.5	8.0
Epirus	114,307	96,369	-17,938	-5.5	1.9	-3.4
Thessaly	262,635	249,540	-13,095	-1.7	0.7	0.6
Ionian Islands	78,382	71,379	-7,003	-3.1	9.3	0.9
Western Greece	260,933	233,023	-27,910	-3.7	3.2	3.5
Central Greece	183,028	180,459	-2,569	-0.5	-2.3	1.1
Attica	1,224,720	1,286,117	61,397	1.6	-0.4	2.9
Peloponnese	221,266	209,973	-11,293	-1.7	2.2	2.5
North Aegean	65,455	59,387	-6,068	-3.2	-5.2	1.9
South Aegean	83,145	82,582	-563	-0.2	1.4	1.6
Crete	196,840	193,384	-3,456	-0.6	0.9	0.8
Total of Greece	3,634,358	3,607,523	-26,835	-0.2	0.1	2.6

Source: NSSG, *Labour Force Survey*, 1988, 1991.

TABLE 4

Employment in Greece by One-digit Occupation, 1981, 1991, 2000

Occupation	Number of Employed Persons			Change of Employment		Occupational Structure of Employment (%)			Change of Employment %
	1981	1991	2000	1981-1991	1991-2000	1981	1991	2000	1991-2000
Professional and Technical Workers	340,900	468,849	556,300	127,949	87,451	9.7	13.0	14.3	18.6
Administrative and Managerial Workers	73,700	60,321	99,500	-13,379	39,179	2.1	1.7	2.6	64.9
Clerical and Related Workers	313,800	425,408	480,600	111,608	55,192	9.0	11.8	12.4	13.0
Sales Workers	343,900	434,495	444,300	90,595	9,805	9.8	12.0	11.4	2.3
Service Workers	274,500	334,996	444,800	60,496	109,804	7.8	9.3	11.5	32.8
Agricultural Workers	1,084,300	810,235	753,600	-274,065	-56,635	30.9	22.5	19.4	-7.0
Production and Related Workers	1,075,900	1,073,216	1,105,300	-2,684	32,084	30.7	29.7	28.4	3.0
All Occupations	3,507,000	3,607,520	3,884,400	100,520	276,880	100.0	100.0	100.0	7.7

Sources: - NSSG, *Labour Force Survey*, 1981, 1991.
- Table A2.

workers. This shows that the high labour absorbing occupations, which are the more traditional ones, namely, elementary and high school teachers, clerical workers, managers of retail and wholesale trade shops, sale workers, tailors and related technicians, construction technicians and workers, and transport workers, are perhaps in a better position to resist recessionary pressures, than other less populous occupations.

Out of 36 major occupations[11], engaging each more than 20,000 workers nationwide and representing 89% of the country's employment, a group of 21, with 2 million workers, experienced each increasing employment, and a group of 15 occupations with 1.2 million workers experienced each decreasing employment. Of the former, 16 occupations (A group) and of the latter 8 occupations (B group) are common in most regions (Table 5). It is noteworthy, that the regional rate of employment change in both A and B occupational groups ranges rather widely, suggesting that, apart from cyclical fluctuations, various other factors affect regional employment with different intensities. The breakdown of these changes, to follow shortly, will enlighten the relative contribution of different factors and give some insights as to the resistance or the sensitivity of the various occupations in the fluctuations of economic activity.

The rising occupations (in the majority of regions) belong to several major groups of workers, such as professional and technical (physicians, dentists, veterinarians, nurses, accountants, lawyers), clerical (accountants, cashiers, clerks), sales (managers, insurance agents and real estate agents, sales), tourism (cooks, waiters), services (barbers, hairdressers, beauticians), agricultural (technicians and workers) - in the face of a continuing shrinkage of total agricultural employment - and finally, production and related workers (food and beverages production, electricians, plumbers, fitters, construction and land and sea transport).

Occupations with decreasing employment (in the majority of regions) are, apart from agricultural workers, drawers, hotel and restaurant owners managers, workers in textiles, and furniture technicians and porters. The rest of the occupations (C group) behave differently in different regions.

It is useful at this juncture to have a glimpse at fast rising and fast declining occupations, with the implication that rapid and widely varying employment changes cannot

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[11]. We concentrate on these occupations in order to make the analysis more manageable, without loosing much in information, given that the 36 occupations employ between 85% and 95% (in most regions over 90%) of total employment, according to region. In addition, in doing so we avoid the implications of the sampling errors of the small figures in many of the left out occupations, which for the sake of completeness are combined in one collective group.

TABLE 5

Regional Concentration of Occupations according to the Direction of Change of their Employment, 1988-1991

A. Occupations with Rising Employment in the Majority of Regions

Code	Occupations	Number of Regions with Rising Employ-ment	Range of Annual Average Rate of Increase (%)	Number of Regions with Declining Employment	Range of Annual Average Rate of Decrease (%)	Average Annual Rate of Increase in Greece (%)	Employ-ment in Greece 1991
06	Medical, Dental, Veterinary etc.	9	2.1 - 26.3	4	2.2 - 11.0	4.3	99,960
11	Accountants	9	1.8 - 28.4	4	5.5 - 38.3	4.4	20,035
12	Jurists	12	1.8 - 85.1	1	1.9	9.4	34,110
33	Bookkeepers, Cashiers, etc.	10	0.0 - 31.4	3	0.9 - 7.9	8.4	65,778
39	Clerical and Related Workers	12	2.4 - 15.7	1	3.4	5.0	233,670
41	Working Proprietors	10	0.0 - 10.8	3	0.6 - 10.4	2.1	215,430
44	Insurance, Real Estate, Securities, etc.	11	1.9 - 156.6	2	7.5 - 25.0	25.0	23,410
45	Salesmen, Shop Assistants etc.	9	3.2 - 16.1	4	0.1 - 8.6	4.4	178,592
53	Cooks, Waiters, Bartenders, etc.	11	0.4 - 21.2	2	2.7 - 8.7	3.6	81,720
57	Hairdressers, Barbers, Beauticians, etc.	9	1.8 - 57.0	4	2.1 - 24.9	4.9	23,985
65	Production and Related Workers in Agriculture	11	19.6-117.8	2	1.3 - 27.1	48.7	84,664
77	Food and Beverages Processors	9	0.2 - 20.7	4	0.4 - 26.2	4.0	57,879
85	Electrical Fitters and Related Workers	10	2.2 - 22.0	3	0.8 - 6.6	4.0	84,664
87	Plumbers, Welders, Sheet Metal Workers	10	0.2 - 18.8	3	4.0 - 16.0	3.5	61,613
95	Brick Layers, Carpenters and Other Construction Workers	11	0.5 - 9.3	2	0.4 - 9.8	4.5	171,482
98	Transport Equipment Operators	10	0.1 - 11.5	3	1.1 - 19.1	0.9	155,756
Total of 16 Occupations		-				5.5	1,592,748 (44.1%)
Group of 48 Minor Occupations*		9	0.6-8.3	4	1.4-6.7	1.1	378,079 (10.5%)

* Of the 48 occupations, 30 with 233,000 workers and a proportion of 6.4% in Greece's employment, experienced rising employment, whereas the 18 occupations with 145,000 workers and 4.0% in Greece's employment, have experienced a declining employment.

TABLE 5 (continued)

B. Occupations with Declining Employment in the Majority of Regions

Code	Occupations	Number of Regions with Declining Employment	Range of Annual Average Rate of Decrease (%)	Number of Regions with Rising Employment	Range of Annual Average Rate of Increase (%)	Average Annual Rate of Decrease Change in Greece (%)	Employ-ment in Greece 1991
03	Draughtsmen, Engineering Technicians	11	5.5 - 33.7	2	5.1 - 12.0	-14.2	25,708
51	Working Proprietors (Catering and Lodging)	13	0.4 - 16.9	0	-	- 6.3	55,796
61	Farmers	9	3.1 - 23.5	4	2.7 -	- 9.1	331,188
62	Field Crop and Vegetable Farm Workers	9	3.9 - 50.7	4	192.4	-11.8	152,165
64	Livestock and Poultry Farm Workers	11	1.3 - 46.8	2	6.2 - 16.5	-11.2	104,771
75	Spinners, Weavers, Knitters, Dyers, etc.	12	3.2 - 17.9	1	0.3 - 4.1	-11.1	32,171
81	Cabinet Makers and Related Workers	9	0.5 - 27.3	4	28.3	- 2.1	52,780
97	Material-Handling and Related Workers	11	3.1 - 19.7	2	0.0 -5.4 8.4 - 16.5	- 8.7	53,427
Total of 8 Occupations		-		-		-9.6	808,006 (22.4%)

C. Occupations with Diversified Employment Change among Regions

Code	Occupations	Number of Regions with Rising Employ-ment	Range of Annual Average Rate of Increase (%)	Number of Regions with Declining Employment	Range of Annual Average Rate of Decrease (%)	Average Annual Rate of Change in Greece (%)	Employ-ment in Greece 1991
02	Architects, Engineers	7	1.8 - 28.3	6	1.8 - 19.2	-1.7	37,772
13	Teachers	8	0.3 - 9.4	5	0.2 - 6.4	3.1	160,424
21	Managers	6	2.1 - 31.8	7	0.9 - 17.6	-0.5	54,288
31	Government Executive Officials	6	0.4 - 7.4	7	1.4 - 21.9	-0.9	83,515
55	Building Caretakers, Charworkers, Clearners, etc.	5	3.4 - 14.4	8	3.2 - 13.8	-3.7	58,022
58	Protective Service Workers	8	0.2 - 14.8	5	1.9 - 10.1	2.0	66,209
63	Orchard, Vineyard and Related Tree Workers	8	1.8 - 73.1	5	6.6 - 38.3	-0.1	107,787
79	Tailors, Dressmakers, Upholsterers etc.	7	1.3 - 38.2	6	1.1 - 12.6	1.8	104,771
83	Blacksmiths, Toolmakers, etc.	7	1.8 - 38.2	6	4.6 - 26.0	-0.3	30,304
84	Machinery Fitters, Machine Assemblers etc.	8	0.1 - 18.8	5	1.6 - 10.5	1.3	68,722
93	Painters	5	4.8 - 13.9	8	0.2 - 17.3	-2.2	27,575
99	Labourers not elsewhere Classified	6	5.2 - 68.1	7	5.5 - 35.8	3.9	29,298
Total of 12 Occupations		-		-		0.6	828,687 (23.0%)

be attributed to cyclical fluctuations alone, but have some more permanent causes. Since what we can get from the short period 1988-1991 data are only indications of non-cyclical influences, we identify - quite arbitrarily must say - the fast changing occupations as those occupations with an average annual rate of employment change, of more than 10% (Table 6).

In a bird's eye view, very few occupations, namely, jurists, insurance, real estate, security workers, and curiously production and related workers in agriculture are fast rising occupations in most of the regions. And, draughtsmen and engineering technicians, livestock and poultry farm workers, and spinners, weavers knitters, dyers are the fast declining occupations in most of the regions. All other fast rising and fast falling occupations are widely dispersed among regions.

From a regional point of view, totally rising or totally declining regions cannot be identified, except perhaps of two regions, namely Western Macedonia and North Aegean with some respective concentration of fast rising and fast falling occupations. One can also say that two other regions, namely Western Greece and Attica, have hardly any fast rising or fast falling occupations.

For a less abstract evaluation of employment changes, we proceed to a shift and share analysis[12] by region, splitting employment changes into three components. The first, reflecting a "cyclical effect", captures the impact of the general economic situation in the country, as represented by the aggregate change in Greek employment. The second component carries a "structural effect", catching structural changes of occupations at the national level. It combines, the impact of industrial restructuring, and of technological change as it impinges on the recomposition of occupations. In contrast to the cyclical effect which is transitional, the structural effect is of a more permanent nature and explains continuous trends. The third component is the residual of the other two and can be attributed to special or local factors, summarized for convenience as a "local effect".[13]

In algebraic notation, the three components of the shift and share analysis are calculated as follows:

$$(E_{irt} - E_{ir(t-1)}) = N_r + S_{ir} + D_{ir}$$

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[12]. See, for instance, Glickman, 1977, Klein and Glickman, 1977.

[13]. Rob Wilson (1992, pp.25-26) has done a similar kind of analysis, but at a national not regional level. His data base refers to the period 1971-1991, and he distinguishes a scale effect-roughly our cyclical effect - an industrial mix effect and an occupational effect. The latter two are combined in our approach to our structural effect. Similar analysis at the regional level is done also for occupations in engineering by Green and Owen (1989).

TABLE 6

Fast Rising (R) and Fast Falling (F) occupations, by region, 1988-1991

Occupation Code (STAKOD)	Regions												
	1	2	3	4	5	6	7	8	9	10	11	12	13
02	F	-	-	-	-	F	-	-	-	R	R	R	-
03	F	F	-	-	F	-	F	F	F	-	R	-	F
06/07	R	-	R	-	-	R	-	F	-	-	R	-	-
11	-	-	R	R	R	-	-	F	-	F	R	-	F
12	R	R	R	R	R	-	-	-	-	R	-	R	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-
21	-	-	R	-	F	R	-	F	-	R	-	F	R
31	-	-	-	F	-	-	-	-	-	-	F	F	-
33	-	-	R	R	-	R	-	-	R	R	R	-	-
39	-	-	R	-	-	-	-	-	-	R	-	-	-
41	-	-	-	F	-	R	-	-	-	-	-	R	-
44	R	R	R	-	R	-	R	-	R	F	R	R	R
45	R	-	-	-	-	-	-	R	-	-	-	-	-
51	-	-	-	F	-	F	-	-	-	-	-	F	F
53	-	-	R	-	-	-	-	-	-	-	-	-	-
55	-	-	R	F	F	-	-	-	-	F	F	-	R
57	-	-	R	R	R	F	F	R	-	R	F	-	-
58	-	-	-	-	R	-	-	F	-	-	-	-	-
61	-	F	R	-	-	-	F	-	-	F	F	R	-
62	F	F	F	-	-	R	-	F	-	-	-	F	R
63	R	R	R	R	R	F	-	-	F	-	R	F	F
64	-	F	F	F	-	F	F	-	-	F	F	F	-
65	R	R	R	R	R	R	R	R	-	R	F	R	R
75	F	F	R	F	-	F	F	F	F	F	F	F	F
77	-	R	F	-	-	R	-	-	-	-	F	-	-
79	-	-	-	R	-	R	-	-	-	F	F	F	-
81	-	-	-	-	F	-	-	-	-	F	F	F	-
83	-	R	F	-	-	F	-	-	-	-	-	R	R
84	-	-	R	-	R	-	-	-	-	-	-	-	F
85	-	-	-	-	-	R	-	-	-	R	R	-	-
87	R	-	-	R	-	R	-	-	-	-	F	R	-
93	-	F	R	F	R	-	R	-	-	-	F	-	F
95	-	-	-	-	-	-	-	-	-	-	-	-	-
97	F	F	-	-	-	R	-	F	-	F	F	F	F
98	-	-	-	-	-	-	-	-	-	-	-	R	F
99	-	-	F	F	-	F	-	R	-	F	R	R	R

Source:Elaboration from NSSG, *Labour Force Survey*, 1988, 1991.

Notes: Fast rising occupations when the annual average rate of growth is more than 10% Fast falling occupations when the annual average rate of decline is more than 10%.

where: $N_r = E_{r(t-1)}N$ (cyclical effect),

$S_{ir} = E_{ir(t-1)}S_i$ (structural effect),

$D_{ir} = E_{irt} - E_{ir(t-1)} - N_r - S_{ir}$ (local effect),

and

$N = (E_t - E_{(t-1)}) / E_{(t-1)}$

$S_i = [(E_{it} - E_{i(t-1)} / E_{i(t-1)}] - N$

E_t, $E_{(t-1)}$ = total employment in the country, respectively for time t and t-1, (1991 and 1988),

E_{it}, $E_{i(t-1)}$ = employment in the i occupation in the country, respectively for time t and t-1 (1991 and 1988),

E_{irt}, $E_{ir(t-1)}$ = employment in the i occupation, in r region for time t and t-1 (1991 and 1988).

For reasons of a less cumbersome exposition, we choose to present qualitatively the predominant effect in each case (occupation - region), that is, the factor with the greatest contribution to the employment change, together with the direction of change (Table 7). Five occupational groups can be distinguished here. The first group comprises 5 occupations with 220,000 workers, predominately affected by cyclical changes. A second group of 13 occupations with 1,103,000 workers experiences mainly the impact of special or local factors, and a third group of 2 major agricultural occupations with 436,000 workers is, as it should be expected, mostly exposed to structural factors.[14] Furthermore, 13 occupations

[14]. The predominance of the structural effect in only a small number of occupations is perhaps a reflection of the long-term nature of structural changes, which our short period (1988-1991) cannot sufficiently picture. It is also likely, that some of the structural changes are hidden in the residual local effects, which as such may overstate the influence of special or local factors.

TABLE 7

Predominant Factor of Increase (+) or Decrease (-) of Employment in the 36 Major Occupations, by Region, 1988-1991

Occupation Code	Regions													Sum		
	1	2	3	4	5	6	7	8	9	10	11	12	13	α	β	γ
02	-α	-α	+γ	+γ	-α	-α	+γ	+γ	-α	+γ	+γ	+γ	-α	6	0	7
03	-α	-α	-α	-α	-α	-α	-α	-α	-α	+γ	+γ	-α	-α	11	0	2
06/07	+γ	+β	+γ	-α	+γ	+γ	+γ	-α	+γ	+γ	+γ	-α	-α	4	1	8
11	-α	+γ	+γ	+γ	+γ	+γ	+γ	-α	+γ	-α	+γ	+γ	-α	4	0	9
12	+γ	+γ	+γ	+γ	+γ	+γ	-α	+γ	+γ	+γ	+γ	+γ	+γ	1	0	12
13	-α	+γ	-γ	-α	-α	-α	+γ	+γ	+γ	+γ	+β	+γ	+γ	4	1	8
21	-α	+γ	+γ	-α	-α	+γ	-α	-α	-α	+γ	+γ	-α	+γ	7	0	6
31	+γ	+γ	-α	-α	+γ	+γ	-α	+γ	+γ	-α	-γ	-α	-α	6	0	7
33	+γ	-α	+γ	+γ	+γ	+γ	+γ	+γ	+γ	+γ	+γ	-α	-α	3	0	10
39	+γ	+β	+γ	+γ	+γ	+β	+β	+γ	+β	+γ	-α	+γ	+γ	1	4	8
41	+γ	+γ	+γ	-γ	-α	+γ	+α	-α	+γ	+γ	+γ	+γ	+γ	3	0	10
44	+γ	+γ	+γ	+γ	+γ	-α	+γ	+γ	+γ	-α	+γ	+γ	+γ	2	0	11
45	+γ	+β	+γ	-α	-α	+γ	-α	+γ	+β	+γ	+γ	-γ	+γ	3	2	8
51	-α	-α	-α	-α	-α	-α	-α	-α	-α	-α	-α	-β	-α	12	1	0
53	+γ	+γ	+γ	+γ	+γ	-α	+γ	-α	+γ	+γ	+γ	+β	+γ	2	1	10
55	+γ	-α	+γ	-α	-α	+γ	-α	-α	-α	-α	-α	+γ	+γ	8	0	5
57	+γ	+γ	+γ	+γ	+γ	-α	-α	+γ	+γ	+γ	-α	-α	+γ	4	0	9
58	+γ	+γ	+γ	-α	+γ	-α	-α	-α	+γ	+γ	+γ	-α	+γ	5	0	8
61	-β	-β	+γ	-β	-β	-β	-β	+γ	+γ	-β	-γ	+γ	-β	0	8	5
62	-β	-β	-β	-β	-β	+γ	-β	-β	+γ	+γ	-α	-γ	+γ	1	7	5
63	+γ	+γ	+γ	+γ	+γ	-γ	+γ	-α	-α	+γ	+γ	-α	-γ	3	0	10
64	-β	-β	-β	-β	-β	-β	-β	+γ	-α	-β	-β	-γ	+γ	1	9	3
65	+γ	+β	+γ	+γ	+β	+γ	+β	+β	-α	+β	-γ	+β	+γ	1	6	6
75	-α	-α	+γ	-α	-α	-α	-α	-α	-α	-α	-α	-α	-α	12	0	1
77	-α	+γ	-α	+γ	-α	+γ	+γ	+γ	+γ	+γ	-γ	+γ	+γ	3	0	10
79	+γ	+γ	-α	+γ	+γ	+γ	-α	+γ	+γ	-α	-α	-α	-α	6	0	7
81	+γ	+γ	-α	+γ	-α	-α	-α	-α	-α	-α	-α	-α	+γ	9	0	4
83	+γ	+γ	-α	-α	+γ	-α	-α	+γ	-α	-α	+γ	+γ	+γ	6	0	7
84	-α	-α	+γ	-α	+γ	+γ	+γ	+γ	+γ	+γ	-α	+γ	-α	5	0	8
85	+γ	+γ	-γ	-α	+γ	+γ	+γ	+γ	+γ	+γ	+γ	-α	+γ	2	0	11
87	+γ	-α	+γ	+γ	+γ	+γ	+γ	+γ	+γ	+γ	-α	+γ	-α	3	0	10
93	-α	-α	+γ	-α	+γ	+γ	+γ	+γ	-α	-α	-α	-γ	-α	7	0	6
95	+γ	+γ	-γ	+γ	+β	+γ	+β	-α	+γ	+γ	+γ	+β	+γ	1	3	9
97	-α	-α	+γ	-α	-α	+γ	-α	-α	-α	-α	-α	-α	-α	11	0	2
98	+γ	-α	+γ	+γ	+γ	+γ	+γ	-α	+γ	+γ	+γ	+γ	-α	3	0	10
99	-α	+γ	-α	-α	-α	-α	-α	+γ	+γ	-α	+γ	+γ	+γ	7	0	6
s α	12	11	8	16	13	12	16	15	13	12	12	13	14	167		
u β	3	7	2	3	5	3	6	2	2	3	2	4	1		43	
m γ	21	18	26	17	18	21	14	19	21	21	22	19	21			258

α: cyclical effect.
β: structural effect.
γ: local effect.

Source: Elaboration from NSSG, *Labour Force Survey*, 1988, 1991.

with about 1,000,000 workers, are in the main jointly affected by cyclical and local factors, and 3 occupations with 470,000 workers by local and structural factors (Table 8).

4.2. Future Prospects

Looking ahead at the end of the century, Greece will be more and more influenced by the conditions of the European Community internal market to which is part and will be more exposed to international competition stemming from the increasing globalization of economic activity. Up to a certain point of adjustment of the economy, these factors may have a negative impact on Greece's employment. The current stabilisation policy which is in fact geared towards that adjustment, by way of reducing inflation and the budget deficit, will sustain a low job creation capacity. Employment will also be negatively affected by an effort of direct job cuts in the overcrowded public sector.

This harmful impact on employment is conjectured to prevail in the first half, or thereabouts, of the 1991-2000 period. Then, as the result of these adjustments and a more intensive growth effort, largely promoted by the incoming finance from Delors II package, the economy is assumed to revive, so that the second half of the period will be characterized by growth and job-creation. On the basis of these thoughts, we find it legitimate to use 1973-1989 as a base period of projections, because it is "similar" to our future horizon, as it also includes a recessionary and an expanding part.

For the purposes of this analysis, changes in output and productivity are the determinants of long-term national employment, which in a top-down manner is, in turn, distributed to the regions.[15] The process is briefly as follows. From a projection of output and productivity by one-digit industry, corresponding employment and total employment of the economy is obtained. Applying the 1991 one-digit occupational structure of total national employment, the number of workers by occupation is calculated, for the year 2000,

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[15]. For methods of occupational and regional forecasting see Glytsos, 1989, pp. 230-233, and for occupational forecasting as applied to the OECD countries see Hughes, 1993.

TABLE 8

Listing of the 36 Major Occupations according to the Predominant Factor of Employment Change, 1988-1991

Code	Occupation	Number of Regions with: Predominant Factor of Employment Change	Increase in Employ-ment	Decrease in Employ-ment	Employment in Greece 1991
I Cyclical Effect (a)		(α)			219,882
03	Draughtsmen, Engineering Technicians	11	2	11	25,708
51	Working Proprietors (Catering and Lodging)	12	0	13	55,796
75	Spinners, Weavers, Knitters, Dyers, etc.	12	1	12	32,171
81	Cabinet Makers and Related Workers	9	3	10	52,780
97	Material-Handling and Related Workers	11	2	11	53,427
II Local Effect (γ)		(γ)			1,103,649
11	Accountants	9	9	4	20,035
12	Jurists	12	12	1	34,110
33	Bookkeepers, Cashiers, etc.	10	10	3	65,778
41	Working Proprietors	10	9	4	215,430
44	Insurance, Real Estate, Securities, etc.	11	11	2	23,410
53	Cooks, Waiters, Bartenders, etc.	10	11	2	81,720
57	Hairdressers, Barbers, Beauticians, etc.	9	9	4	23,985
63	Orchard Vineyard and Related Tree Workers	10	8	5	107,787
77	Food and Beverages Processors	10	9	4	57,879
85	Electrical Fitters and Related Workers	11	10	3	84,664
87	Plumbers, Welders, Sheet Metal Workers	10	10	3	61,613
95	Bricklayers, Carpenters and Other Construction Workers	9	11	2	171,482
98	Transport Equipment Operators, etc.	10	10	3	155,756
III Structural Effect (β)		(β)			435,959
61	Farmers	8	4	9	331,188
64	Livestock and Poultry Farm Workers	9	2	11	104,771
IV Cyclical and Local Effects (α,γ)		(α,γ)			999,452
02	Architects, Engineers	13	7	6	37,772
06	Medical, Dental, Veterinary, etc.	12	8	5	99,960
13	Teachers	12	8	5	160,424
21	Managers	13	6	7	54,288
31	Government Executive Officials	13	6	7	83,515
45	Salesmen, Shop Assistants, etc.	11	9	4	178,592
55	Building Caretakers, Charworkers, Cleaners, etc.	13	5	8	58,022
58	Protective Service Workers	13	8	5	66,209
79	Tailors, Dressmakers, Upholsterers, etc.	13	7	6	104,771
83	Blacksmiths, Toolmakers, etc.	13	7	6	30,304
84	Machinery Fitters, Machine Assemblers, etc.	13	8	5	68,722
93	Painters	13	5	8	27,575
99	Labourers, not elsewhere Classified	13	6	7	29,298
V Local and Structural Effects (γ,β)		(γ,β)			470,499
39	Clerical and Related Workers	12	12	1	233,670
62	Field Crop and Vegetable Farm Workers	12	4	9	152,165
65	Production and Related Workers in Agriculture	12	11	2	84,664

Sources: -Elaboration from Table 7.
-NSSG, *Labour Force Survey,* 1991.

and the new job creation for the period 1991-2000.[16] The use of constant occupational shares means that any restructuring of occupational employment, during the projection period, is due to the change in the industrial structure and not to factors, such as technological change that may directly affect the occupational mix.[17]

Moving to the regional level, occupational employment by region is obtained by applying the 1991 regional structure of each occupation on its predicted national figure.[18] Subsequently, employment by two-digit occupation in each region is routinely calculated, according to the corresponding 1991 one-digit occupational breakdown.

In algebraic form, this chain of calculations is depicted as follows:

$$Y_{kt} = a_1 + b_1 t \qquad \text{(output equation)},$$

$$(Y_k/L_k)_t = a_2 + b_2 t \qquad \text{(productivity equation)},$$

where:

Y_{kt} = output,

$(Y_k/L_k)_t$ = productivity,

t = 1,2,..., 17 years (1973-1989), and

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[16]. Normally, occupational structures by industry between two years are projected, as done among others by Wilson (1992, p. 31), on the assumption of continuation of past trends. Since no pronounced trend has been observed in our available data such an assumption cannot be made. Occupational employment forecasts based on macroeconomic trend extrapolations by economic sector are used, despite their weaknesses, by the Bureau of Labor Statistics in the U.S. and by the Institut fur Arbeitsmarkt und Berufsvorschung in Germany. On this see, for instance, Dekker, de Grip, Heijke, 1988, p. 2. More generally, manpower forecasts by occupation are now done on a regular basis by Institutes, in various countries, including Canada, U.S.A., France, U.K., Germany and The Netherlands (see Corcoran and Hughes, 1991, p. 6). For a recent severe criticism of manpower planning, in particular as an instrument of educational planning, see Psacharopoulos, 1991.

[17]. For factors affecting occupational structures see, for instance, Silvestri and Lukasiewicz, 1985, p. 44.

[18]. For the use of the projected national figures as the basis for regional projections see, for instance, e.g. Berendsen et al., 1992, p. 2.

k = 1,2,..., 8 industries.

Estimating coefficients a and b and setting t = 28 (for the year 2000), output $\hat{Y}_{k2000}$ and productivity by industry $(Y_k/\hat{L}_k)_{2000}$ are obtained for the year 2000. Then employment by industry, and total employment for the economy are respectively estimated as,

$$L_{k2000} = \frac{\hat{Y}_{k2000}}{(Y_k/\hat{L}_k)_{2000}} \text{ and } L_{2000} = \sum_{k=1}^{8} L_{k2000}.$$

National employment by one-digit occupation i, is:

$$L_{i2000} = (L_i / L)_{1991} L_{2000},$$

and the occupational employment by region r,

$$L_{ir2000} = (L_{ir} / L_i)_{1991} L_{i2000}.$$

Subsequently, employment by two-digit occupation is given by,

$$L_{jir2000} = (L_{jir} / L_{ir})_{1991} L_{ir2000},$$

where: i = 1,2,...,7 stands for one-digit occupations, r = 1,2,...,13 for region and j = 1,2...,36 for two-digit occupations.[19]

The predicted new jobs by one digit occupation are presented in the earlier table 4, and by two-digit occupation and region in Table A2. Apart from the very rapid increase in administrative and managerial workers, which may not be valid, because of statistical defects in the figures of this occupational category, employment in services is expected to increase by about 1/3 and employment of professional and technical workers by 18.6%, and

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[19]. The projection of occupational structures of employment by industry, which is often applied for distributing estimated industrial employment to occupations is not feasible in our case. This is because occupational employment changes by industry have not demonstrated any time trend but rather random ups and downs (see Glytsos, 1990). Neither could the region-country employment relation be properly projected with our regional data.

of clerical workers by 13.0%. Sales and production workers are expected to increase by a very low percentage and agricultural workers to decrease by 7%.

Projections of occupational employment by various Institutes in Europe converge in finding an increase in the demand for scientists, technical workers, and high specializationworkers. In France, for instance, the increase in the employment of professional occupations, is projected to over 20%, for technical occupations to 19% and for administrative and managerial workers to 18%, during the period 1986-1994. On the other hand, the demand for unskilled workers is expected to decline by 17% and for farmers and farm workers by 22%. In the United Kingdom, employment in managerial and scientific workers is expected to increase rapidly, whereas in Germany the employment in high specialization occupations is expected to increase by 3.4 million, during the period 1985-2010, against a 2 million decrease in the employment of low specialization specializations.[20]

As it can be gathered from the detailed Table A2, between 52% and 83% of the new jobs, depending on the region, are concentrated in 8 occupations, which in descending order of significance are: managers of public and private enterprises, clerical workers, elementary and high school teachers, cooks and waiters, protection and security workers, guards and domestics, phycisians, dentists, veterinarians and nurses, and managers - owners of hotels and restaurants.[21]

Concluding, the assumptions of constant occupational structures nationwide and constant regional shares of occupations leads to employment projections and not to employment forecasts - one can hardly forecast ten years ahead what the actual demand for labour by occupation would be. So, our predicted figures express rather what is the likely situation if the labour market functions under the present degree of inflexibilities and under an employment neutral technological change. Such predictions can be a yardstick against which to evaluate the net future impact of a changing labour market behaviour that may be induced by economic changes or labour market policies.

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[20]. Commission of the European Communities, 1991, p.131.

[21]. The "static" nature of the estimates produced by the methodology used retain a relative uniformity between past and future occupational structures among regions.

5. LABOUR SHORTAGES

A concise balance of the estimated aggregate figures of new labour force and of job openings by region, for the period 1991-2000, is presented in Table 9. Total job-openings, including new jobs and replacement requirements, as calculated in the form of exit, amount to 917,000 (277,000 new jobs and 640,000 replacement). In counterpart, the new demographic entry to the labour force, i.e. only of the young generation, is 465,000 covering about half of total labour requirements.

Labour shortages, defined as the difference between the demographic change of the labour force and total labour requirements, are met in all one-digit occupations and in all regions, totalling 452,000 workers.[22] Attica and Central Macedonia, the two regions with, respectively, the most populous cities of Athens and Thessaloniki, are likely to be by 340,000 workers short of their labour requirements. They have the higher labour shortages, not only in absolute figures, but also in proportion to their requirements, which is largely related to their high retirement rate.

Concentrating to the non-agricultural sector, labour shortages sum to 543,000 workers, ranging among regions between 44.5% and 76.2% of their requirements (Table 10). Administrative and managerial occupations appear with the more acute labour shortages, followed by service occupations and professional and technical occupations. Relatively weaker, but still substantial, will be the pressure on clerical workers, sales workers and production workers. Service and production workers, and to a lesser extent professional and technical occupations, have the higher absorbing capacity in terms of number of workers.

One should note that there is more to it than to consider the mere absolute or proportional figures of labour shortages. The educational composition of the labour force also changes. Only 5.8% of the retirees have third level education, 6.8% secondary education, and 29% are illiterate. From the rest, 55% have finished primary school and 3% its third grade. The newcomers are, in contrast, more educated, with 10.5% having third

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[22]. Labour shortages stemming from demographic factors are also postulated for the United Kingdom, following which the suggestion is made that employers should turn to other sources of labour supply, such as retirees, inactive females, unemployed and migrants. (Wilson, 1988, p. 30).

TABLE 9

Balance of Labour Requirements and New Labour Force, by Region, 1991-2000

Regions	Labour Requirements (1991-2000)			New entry in the Labour Force (1991-2000)	Labour Shortages (1991-2000)		Number of Unemployed, 1991	Unemployed (+) or Additional Labour Requirements (-) 2000	2000	
	New Jobs	Replacement	Total Requirements		Absolute Figures	% of total Requirements			Labour Force	Employment
	(1)	(2)	(3)	(4)	(5) = (4)-(3)	(6) = (5):(3)	(7)	(8) = (7) = (5)		
Eastern Macedonia and Thrace	6,802	34,627	41,429	32,419	-9,010	21.7	13,428	4,418	242,667	238,249
Central Macedonia	40,371	107,265	147,636	66,473	-81,163	55.0	39,783	-41,380	615,767	657,147
Western Macedonia	5,720	16,320	22,040	16,951	-5,089	23.1	8,330	3,241	106,048	102,807
Epirus	5,889	15,481	21,370	13,979	-7,391	34.6	10,484	3,093	105,351	102,258
Thessaly	10,733	39,571	50,304	33,175	-17,129	34.0	18,527	1,398	261,671	260,273
Ionian Islands	4,728	11,600	16,328	8,807	-7,521	46.1	2,729	-4,792	71,315	76,107
Western Greece	11,117	36,764	47,881	33,588	-14,293	29.9	22,548	8,255	252,395	244,140
Central Greece	6,845	28,180	35,025	22,512	-12,513	35.7	14,003	1,490	188,794	187,304
Attica	156,224	261,209	417,433	159,046	-258,387	61.9	141,968	-116,419	1,325,922	1,442,341
Peloponnese	6,782	33,917	40,699	26,305	-14,394	35.4	12,495	-1,899	214,856	216,755
North Aegean	5,045	10,635	15,680	9,220	-6,460	41.2	5,960	-500	63,932	64,432
South Aegean	8,871	16,466	25,337	12,784	-12,553	49.5	3,088	-9,465	81,988	91,453
Crete	7,750	28,503	36,253	29,791	-6,462	17.8	8,043	1,581	202,715	201,134
Greece	276,877	640,538	917,415	465,050	-452,365	49.3	301,386	-150,979	3,733,421	3,884,400

Sources: -NSSG, *Labour Force Survey*, 1991.
-Tables 2, A1, A2.

TABLE 10

Labour Shortages by One-digit Occupation and Region, 1991-2000

Regions	Professional and Technical Workers		Administrative and Managerial		Clerical Workers		Sales Workers		Service Workers		Production Workers		Non-agric. Sector	
	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments	Absolute Figure	% to Labour Require-ments
Eastern Macedonia and Thrace	3,446	56.5	1,457	78.3	2,205	48.4	1,944	39.6	7,465	68.0	5,062	39.3	21,579	60.1
Central Macedonia	19,640	68.3	8,999	83.7	9,795	61.1	9,911	55.5	21,001	76.6	26,027	56.3	95,373	72.9
Western Macedonia	1,731	49.8	818	73.3	691	33.9	719	31.8	2,407	61.0	2,721	31.1	9,087	46.8
Epirus	2,541	56.3	624	78.0	754	43.3	802	43.5	3,665	68.3	2,867	43.1	11,253	57.8
Thessaly	5,570	59.3	1,321	79.9	2,353	51.6	2,394	43.9	8,088	70.4	8,140	45.9	27,866	62.1
Ionian Islands	1,394	62.5	650	81.4	1,094	53.6	906	50.9	3,740	73.6	2,139	51.1	9,923	66.7
Western Greece	5,592	56.2	2,031	78.0	2,885	47.6	2,258	41.1	6,701	67.4	5,867	41.7	25,334	44.5
Central Greece	3,147	61.9	1,162	81.2	1,921	51.6	1,466	44.7	5,397	72.1	6,776	49.5	19,869	66.2
Attica	58,588	65.3	28,272	82.2	40,812	57.5	24,142	52.1	55,338	74.2	53,537	52.6	260,689	76.2
Peloponnese	3,404	61.9	2,134	80.2	2,277	53.5	1,818	47.0	6,949	72.0	5,309	46.3	21,891	73.6
North Aegean	1,670	52.5	370	76.9	899	48.4	910	40.3	2,779	65.6	1,747	44.1	8,375	62.0
South Aegean	1,794	57.6	618	77.3	994	42.5	969	35.8	6,761	67.6	2,314	36.5	13,450	65.4
Crete	2,991	53.8	1,831	76.4	1,892	43.2	1,363	35.2	6,777	65.5	3,645	37.6	18,499	58.0
All Regions	111,508	63,2	50,287	81.4	68,572	55.1	49,602	48.7	137,068	71.9	126,151	49.0	543,188	59.5

Source: Estimates.

level education,[23] 34.6% secondary education, 32.7% have finished primary school, 19.5% its third grade, and only 1.2% are completely illiterate.

The fact that the new entrants to the labour force are more educated may in reality intensify labour shortages, because of mismatches between job openings and labour supply skills. The presence of such imbalances is already manifested in the relatively rapidly rising unemployment rate of secondary school leavers and of university graduates, as well as the considerable fill of low qualification vacancies by unskilled or low skilled migrant workers.

But apart from the new entry, the existing stock of over 300,000 unemployed workers, making up 7.7% (1991) of the total labour force, is also in search of jobs. The rate of unemployment is about three times higher for women than for men (11.9% as against 4.4%). Youth (14-24) with an unemployment rate of 24.5% have a share in total unemployment of 44%. In other words, close to half of the unemployed are new comers to the labour market and the other half have worked before.

Unemployment differs widely among regions, ranging between 3.6% and 9.9%. Attica has the highest unemployment rate (9.9%), and close by are Epirus (9.8), North Aegean (8.9%) and Western Greece (8.8%). Relatively low are the unemployment rates in the Ionian Islands (3.6%) and the South Aegean (3.6%). The rest of the regions are between 4.0% and 6.9% (Table 11).

Construction industry occupations have experienced a relatively higher unemployment in many regions. Considerable unemployment is also observed, in most regions, in teachers, clerical workers, and touristic occupations, especially in the island regions, because of the seasonality of the industry (Table 12).

Our estimates show that even if all the unemployed workers would be hired - not a likely occurrence given frictional unemployment - there would still be left a considerable proportion of vacancies to be filled by additional entry to the labour force from the non-active section of the population, from repatriating Greek migrants, or from foreign workers.[24] Such vacancies would persist in Attica and Central Macedonia, Ionian Islands,

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[23]. Notice that 4.7% of the retirees are university degree holders and almost the same proportion (4.9%) are the new entrants in the labour market, although they come from a new generation of more educated youth. This can be explained by the fact that young men are enlisted in the army for about two years. Therefore, many with university degrees enter the labour market at an age of over 24, and are not thus, included in our new entry of the 15-24 youth. Actually, university graduates in the 25-29 age bracket represent 14.9% of the corresponding labour force.

[24]. It should be pointed out, that an estimate of about 86,000 redundant farmers are already accounted for as a negative item in the calculation of the new jobs.

TABLE 11

Regional Unemployment, 1991

	Regions						
	1	2	3	4	5	6	7
	Eastern Macedonia and Thrace	Central Macedo-nia	Western Mace-donia	Epirus	Thessaly	Ionian Islands	Western Greece
Number of Unemployed	13,400	39,800	8,300	10,500	18,500	2,700	22,500
Unemployed Rate	5.4	6.0	7.9	9.8	6.8	3.6	8.8

	Regions						
	8	9	10	11	12	13	14
	Central Greece	Attica	Pelo-ponnese	North Aegean	South Aegean	Crete	Greece
Number of Unemployed	14,000	142,000	12,500	6,000	3,100	8,100	301,400
Unemployed Rate	7.2	9.9	5.6	8.9	3.6	4.0	7.7

Source: NSSG, *Labour Force Survey,* 1991.

TABLE 12

Registered Unemployment by Occupational Group and Region, 1988

Regions	Occupational Groups							
	Construction Workers		Teachers and Clerical Workers		Tourism		All the Rest	
	Share in the Unemployment of the Region	Share in the Employment of the Region	Share in the Unemployment of the Region	Share in the Employment of the Region	Share in the Unemployment of the Region	Share in the Employment of the Region	Share in the Unemployment of the Region	Share in the Employment of the Region
Eastern Macedonia and Thrace	54.3	3.4	6.9	8.3	3.7	3.1	35.1	85.2
Central Macedonia	35.1	4.3	18.3	11.3	7.2	3.3	39.4	81.1
Western Macedonia	59.8	4.6	10.7	9.8	1.9	2.0	27.6	83.6
Epirus	39.8	6.2	20.8	10.7	11.1	3.6	28.3	79.5
Thessaly	31.7	5.4	25.8	8.5	6.6	3.0	35.9	83.1
Ionian Islands	12.6	5.5	12.1	10.0	65.6	7.6	9.7	76.9
Western Greece	28.2	3.6	29.0	9.5	9.7	2.4	33.1	84.5
Central Greece	33.6	5.1	25.5	8.5	9.5	3.3	31.4	83.1
Attica	20.4	4.6	31.7	20.2	13.1	5.4	34.8	69.8
Peloponnese	29.1	5.5	25.7	7.1	23.4	2.9	21.8	84.5
North Aegean	34.7	6.2	31.1	13.3	24.1	6.2	10.1	74.3
South Aegean	6.1	9.8	10.9	11.6	70.3	13.1	12.7	65.5
Crete	8.2	5.0	22.0	9.5	53.8	4.8	16.0	80.7
Greece	28.7	4.8	22.8	13.3	16.8	4.3	31.7	77.6

Source: Elaboration from OAED, *Analysis of Registered Unemployment by Prefecture and Occupation (1981-1988)*, Athens, 1990, mimeo, NSSG, *Labour Force Survey*, 1988.

Note: The intensity of unemployment is obtained by comparing the share in unemployment and the share in employment by occupational group, and not as the conventional rate of unemployment, because the registered unemployment is only about one-third of the actual unemployment.

Peloponnese, and the North and South Aegean. The rest of the regions will not be able to absorb all of their unemployed, so that in the year 2000 they will have some excess labour supply, which could be moved to the regions that have vacancies to fill.

To get a more refined picture of the relative intensity of labour shortages by occupation and region, as well as an ordinal ranking of them according to the degree of additional labour requirements, consideration must be given to both the supply and demand elements of our findings. On the demand side, the assessment of the interoccupational significance of labour shortages by region, and of the interregional weight of labour shortages by occupation is needed. On the supply side, the extent that labour requirements can be satisfied may be expressed by the interoccupational share of the new entry in the labour force. On balance, the interoccupational labour shortages (resulting from the labour requirements - labour supply relation) gives the intensity of the pressure of labour shortages on the regional labour market. This pressure is however mitigated by the corresponding unemployment rate. Given these factors, the interregional share in national employment by occupation carries the relative weight of regions in each occupation.

These elements are expressed by a series of ratios, presented in Table A3 and combined in an "index of labour shortages" (ε epsilon) which may rank occupations and regions according to the relative intensity of their labour shortages, i.e.

$$\epsilon_{ir} = \left(\frac{v_{ir}}{s_{ir}}\right)(1 - m_{ir})\,\frac{(1-u_{ir})}{(1-d_{ir})}\,(1-p_{irc}),$$

where:

v_{ir} = share of i occupation in total labour requirements of r region,

s_{ir} = share of new labour supply of i occupation of r region,

m_{ir} = ratio of new labour supply over labour requirements of i occupation of r region,

u_{ir} = share of i occupation in the unemployment of r region,

d_{ir} = share of labour shortage of i occupation in r region,

pirc = share of i occupation of r region in total labour requirements of i occupation in the country.

The term $(1-p_{irc})$ pushes the index of labour shortages in regions, as for instance, Attica, which have a high share in certain occupations. It incorporates, in other words, the

significance of large numbers in labour shortages. In regions where p_{irc} is very small, this term leaves the index almost intact to be determined only by regional conditions. The role of the term $(1-m_{ir})$ is to complement (v_{ir}/s_{ir}), which, as a ratio of shares, ignores the gap between new labour supply and labour requirements, in absolute terms. Finally, the expression $(1-u_{ir})/(1-d_{ir})$ gives the contribution of unemployment in the alleviation of labour shortages, taking simultaneously into account their interoccupational intensity in the region as expressed by d_{ir}.

Theoretically, the index could range between zero, when $v_{ir}=0$ or $m_{ij}=1$, and infinity, when $s_{ir}=0$. But these extreme values are realistically impossible, and the calculated index ranges between 0.08 and 3.25 (Table 13). One can observe that the ranking of occupations is to a great extent common for most regions, with differences however in the intensity of labour shortages. Highest indexes have the administrative and managerial workers and lowest indexes production and related workers. The ranking of pairs of occupations and regions according to the intensity of their labour shortages, presented in Table 14, is useful for various purposes. For instance, to consider the possibilities of additional opportunities of employment for new labour force with certain qualifications, that is expected to flow into a region; also in case the government wants to adopt policies for the insertion in the labour market of additional workers, such as foreign migrants, or give incentives for labour mobility between occupations and regions.

TABLE 13

Index of Labour Shortages by Occupation and Region*

Regions		Occupations						All Occupations
		Professional Technical and Related Workers (A)	Administrative and Managerial Workers (B)	Clerical and Related Workers (C)	Sales Workers (D)	Service Workers (E)	Production and Related Workers, etc. (F)	
1.	Eastern Macedonia and Thrace	1.26	3.23	0.77	0.57	2.60	0.13	1.43
2.	Central Macedonia	1.28	3.05	0.78	0.70	1.97	0.34	1.35
3.	Western Macedonia	0.90	2.46	0.42	0.39	1.64	0.08	0.98
4.	Epirus	1.00	2.38	0.47	0.53	1.94	0.24	1.09
5.	Thessaly	1.07	2.84	0.68	0.56	2.19	0.35	1.28
6.	Ionian Islands	1.04	2.55	0.61	0.61	1.04	0.57	1.07
7.	Western Greece	1.06	2.80	0.59	0.57	1.87	0.31	1.20
8.	Central Greece	1.19	3.01	0.61	0.55	2.20	0.42	1.33
9.	Attica	1.16	3.09	0.74	0.58	1.73	0.43	1.29
10.	Peloponnese	1.24	3.25	0.75	0.67	2.29	0.43	1.44
11.	North Aegean	0.73	2.09	0.48	0.44	1.43	0.34	0.92
12.	South Aegean	0.81	1.87	0.34	0.29	0.83	0.30	0.74
13.	Crete	1.08	3.06	0.58	0.48	1.44	0.51	1.19
Greece		1.06	2.74	0.60	0.53	1.78	0.34	1.18

Source: Table A3.

* Agricultural production workers are not included, because in all cases there is a labour surplus. The last column and the last row of the table are simple averages (they are already weighted by virtue of the methodology of their calculation).

TABLE 14

Ranking of Occupation-Region Pairs according to their Intensity of Labour Shortages

Occupation-Region Pairs	Index of Labour Shortages	Occupation-Region Pairs	Index of Labour Shortages
B-10	3.25	A-11	0.73
B-1	3.23	D-2	0.70
B-9	3.09	C-5	0.68
B-13	3.06	D-10	0.67
B-2	3.05	C-6	0.61
B-8	3.01	C-8	0.61
B-5	2.84	D-6	0.61
B-7	2.80	C-7	0.59
E-1	2.60	C-13	0.58
B-6	2.55	D-9	0.58
B-3	2.46	D-1	0.57
B-4	2.38	D-7	0.57
E-10	2.29	F-6	0.57
E-8	2.20	D-5	0.56
E-5	2.19	D-8	0.55
B-11	2.09	D-4	0.53
E-2	1.97	F-13	0.51
E-4	1.94	C-11	0.48
B-12	1.87	D-13	0.48
E-7	1.87	C-4	0.47
E-9	1.73	D-11	0.44
E-3	1.64	F-9	0.43
E-13	1.44	F-10	0.43
E-11	1.43	C-3	0.42
A-2	1.28	F-8	0.42
A-1	1.26	D-3	0.39
A-10	1.24	F-5	0.35
A-8	1.19	C-12	0.34
A-9	1.16	F-2	0.34
A-13	1.08	F-11	0.34
A-5	1.07	F-7	0.31
A-7	1.06	F-12	0.30
A-6	1.04	D-12	0.29
E-6	1.04	F-4	0.24
A-4	1.00	F-1	0.13
A-3	0.90	F-3	0.08
E-12	0.83		
A-12	0.81		
C-2	0.78		
C-1	0.77		
C-10	0.75		
C-9	0.74		

Source: Table 13.

6. CONCLUDING REMARKS

Through a multi-facet analysis, this paper evaluates the forthcoming demographic changes of the labour force and the factors of employment change, and provides some quantitative indications of a long-term employment outlook and of labour shortages by occupation and region.

The fast falling, soon to be negative, natural population growth will have a strong but differentiated negative impact on the future labour force in all regions of Greece. On the demand side, in the face of a decreasing overall employment in the majority of regions there are many flourishing and many declining occupations, whose developments this paper tries to explain, discerning the relative weight of cyclical, structural and local factors in employment change.

The analysis brings to light some uniformities and some diversities in the behaviour of occupational employment by region, and the degree of labour market flexibility to changing economic conditions.

On balance, the labour shortages generated in many of the regions and occupations exceed the current level of unemployment. Consequently, a higher labour mobility and an additional labour supply from existing population or from migrant population would likely be needed, until the end of the century.

APPENDIX

TABLE A1

Exit from the Labour Force by Two-digit Occupations and by Region, 1991-2000

Code	Regions													Greece
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Total of 36 Occupations	30,795	95,620	14,373	14,301	36,087	10,877	33,749	24,583	225,114	28,236	9,249	13,973	26,127	563,084
02	110	1,065	123	82	325	41	439	176	4,196	232	95	55	219	7,158
03	260	662	68	96	271	54	184	96	2,707	149	109	68	110	4,834
06/07	590	3,440	368	532	790	286	1,026	301	9,926	615	451	287	351	18,963
11	53	547	82	54	247	41	138	29	2,301	41	28	95	110	3,766
12	163	1,051	123	96	300	68	255	137	3,835	232	55	82	68	6,465
13	1,475	5,614	709	1,106	2,005	476	2,317	1,444	11,957	1,061	600	491	1,335	30,590
21	456	3,760	349	215	510	241	881	484	11,287	833	161	241	886	20,304
31	551	1,559	270	328	586	187	822	492	7,690	421	153	152	456	13,667
33	397	1,639	222	152	434	328	547	211	5,639	315	153	292	397	10,726
39	1,194	4,679	550	479	1,159	573	1,686	1,204	22,674	1,252	480	830	1,265	38,025
41	2,540	8,142	1,203	914	2,848	989	2,729	1,826	17,798	2,101	1,081	1,705	1,828	45,704
44	122	736	61	-	244	45	238	32	3,126	59	30	152	91	4,936
45	1,737	6,654	624	517	1,805	519	1,632	1,308	18,382	1,278	639	715	1,491	37,301
51	1,003	1,962	363	605	917	416	1,000	902	3,549	1,003	502	642	656	13,520
53	1,106	3,182	468	641	1,159	709	844	623	6,654	1,039	502	1,576	1,195	19,698
55	744	1,800	295	277	483	311	606	432	7,161	348	259	346	830	13,892
57	259	813	190	155	483	35	177	276	2,598	348	68	138	226	5,766
58	1,021	2,044	295	450	1,318	381	1,155	570	6,623	900	295	296	656	16,004
61	3,504	3,756	368	869	1,715	1,209	2,666	2,511	304	2,723	258	300	3,668	23,851
62	1,368	3,272	606	327	2,422	47	1,903	237	257	165	36	26	303	10,969
63	282	1,687	304	87	471	175	177	717	123	2,620	248	16	846	7,753
64	702	922	538	818	1,322	63	683	998	158	509	160	36	644	7,553
65	1,093	1,271	155	223	380	228	598	321	364	585	57	62	758	6,095
75	225	1,594	59	151	840	-	473	419	2,768	167	-	-	91	6,787
77	652	2,944	132	452	931	226	849	373	4,018	617	119	298	531	12,142
79	2,098	6,582	1,799	346	1,206	151	1,030	221	7,857	283	-	167	290	22,030
81	605	2,371	288	273	779	344	376	303	4,464	345	119	196	564	11,027
83	261	1,145	74	167	641	29	291	419	2,500	345	76	77	390	6,415
84	427	2,453	406	329	1,084	165	849	978	6,429	586	135	286	290	14,417
85	735	2,575	818	257	1,160	463	982	1,106	7,322	1,130	211	375	738	17,872
87	403	1,554	288	257	962	212	679	710	6,429	523	135	208	539	12,899
93	130	736	59	167	458	179	461	233	2,500	335	76	238	224	5,796
95	1,814	5,478	516	1,646	2,748	947	2,122	1,793	11,340	2,742	1,040	1,703	2,156	36,045
97	652	2,003	619	329	901	136	812	757	3,839	408	119	226	390	11,191
98	1,897	4,742	848	798	1,939	574	1,916	1,700	13,750	1,748	664	1,012	1,145	32,733
99	166	1,186	133	106	244	29	206	244	2,589	178	135	584	390	6,190
Rest of Occupations	3,832	11,645	1,947	1,180	3,484	723	3,015	3,597	36,095	5,681	1,386	2,493	2,376	77,454
General Total	34,627	107,265	16,320	15,481	39,571	11,600	36,764	28,180	261,209	33,917	10,635	16,466	28,503	640,538
36 Occupations as % of Total	88.9	89.1	88.1	92.4	91.2	93.8	91.8	87.2	86.2	83.3	87.0	84.9	91.7	

Sources: -NSSG, *Labour Force Survey*, 1981, 1991.

-Estimates.

TABLE A2

New Jobs by Two-digit Occupations and by Region, 1991-2000

Code	Regions													Greece
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Total of 36 Occupations	5,136	35,239	5,056	5,179	8,816	3,990	23,224	5,408	116,888	5,566	4,253	6,579	5,739	231,073
02	107	1,068	136	75	290	38	898	163	3,825	227	78	63	231	7,199
03	252	626	74	90	246	46	501	94	2,346	141	92	76	116	4,700
06/07	572	3,443	397	497	731	257	1,648	291	9,126	615	378	317	340	18,612
11	44	552	87	46	239	38	274	33	1,961	44	25	102	116	3,561
12	150	1,050	136	90	282	60	206	137	3,580	227	51	89	72	6,130
13	1,396	5,633	769	1,039	1,880	423	2,489	1,374	11,190	1,038	497	536	1,361	29,625
21	809	6,550	617	368	855	412	1,427	874	19,392	1,457	251	412	1,510	34,934
31	466	1,276	194	209	492	134	1,675	351	5,500	340	149	94	361	11,241
33	326	1,328	156	97	371	236	940	152	3,918	251	149	185	317	8,426
39	977	3,757	391	300	971	403	3,432	843	15,846	1,009	460	534	1,026	29,969
41	200	674	224	177	200	143	1,815	54	847	220	201	56	196	5,007
44	13	20	12	--	27	4	148	7	159	0	5	3	8	406
45	152	553	116	95	141	80	1,091	32	1,007	130	119	21	156	3,693
51	1,330	2,710	472	837	1,265	613	1,241	1,262	4,592	1,417	619	905	898	18,161
53	1,466	4,337	611	892	1,594	1,034	1,628	867	8,610	1,473	619	2,208	1,650	26,989
55	988	2,460	386	388	658	453	1,358	599	9,030	499	314	484	1,141	18,753
57	342	1,109	247	213	658	53	391	377	3,383	499	81	189	315	7,857
58	1,361	2,799	386	624	1,828	560	1,892	787	8,580	1,270	365	421	898	21,771
61	-	-3,628	-270	-702	-1,655	-	-2,732	-2,359	-385	-2,557	-346	-272	-3,626	-23,060
62	3,459	-2,988	-453	-251	-2,378	1,069	-1,901	-228	-336	-164	-51	-27	-330	-10,511
63	-	-1,665	-249	-81	-458	-36	-169	-694	-168	-2,528	-327	-12	-871	-7,614
64	1,368	-856	-415	-648	-1,333	-158	-701	-919	-218	-457	-214	-35	-602	-7,076
65	-234	-1,229	-120	-176	-346	-48	-577	-289	-487	-556	-77	-55	-789	-6,013
75	-630	262	5	28	184	-198	67	58	284	24	-	-	19	946
77	-	473	10	84	133	-	277	44	92	56	29	1	104	1,413
79	1,114	972	355	61	193	37	800	15	674	9	-	15	67	3,377
81	15	472	59	61	99	25	139	58	127	26	29	14	52	1,241
83	73	216	6	39	69	46	32	58	407	26	28	15	55	991
84	191	226	67	50	166	-3	576	160	564	46	35	15	67	2,053
85	59	612	171	50	183	23	896	218	632	177	63	15	121	3,310
87	43	349	59	50	139	55	578	131	348	29	35	1	73	1,845
93	58	82	5	39	101	38	138	73	192	47	28	1	27	741
95	117	885	111	325	460	22	1,134	306	653	252	306	104	364	5,222
97	15	252	120	50	125	145	420	145	79	44	29	15	55	1,433
98	-14	730	174	146	353	26	1,100	276	1,053	233	198	74	186	4,772
99	177	129	10	22	53	101	93	58	485	2	35	15	55	969
Rest of Occupations	1,666	5,132	664	710	1,917	738	12,107	1,437	39,336	1,216	792	2,292	2,011	45,804
General Total	6,802	40,371	5,720	5,889	10,733	4,728	11,117	6,845	156,224	6,782	5,045	8,871	7,750	276,871
36 Occupations as % of Total	75.5	87.3	88.4	87.9	82.1	84.4	208.9	79.0	74.8	82.1	84.3	74.2	74.1	83.5
36 Occupations as % of Employment 1991	91.0	90.2	89.3	93.1	92.3	95.1	87.1	89.6	87.4	92.6	86.5	85.3	93.6	88.8

Sources -NSSG, *Labour Force Survey*, 1991
Estimates

Table A3

Occupational Composition of Labour Requirements by Region, 1991-2000

Greece

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	19.3	6.8	13.6	11.1	20.8	0.2	28.2	914,415
New Labour Supply	14.0	2.5	12.0	11.2	11.5	20.6	28.2	465,050
Labour Shortages*	20.5	9.3	12.6	9.1	25.3	-	23.2	543,188
Registered Unemployed	11.0	0.2	16.7	6.4	13.5	0.9	51.3	78,150
Index of Labour Shortages (ε)	1.94	4.89	1.19	0.99	3.00	-	0.59	

Eastern Macedonia and Thrace

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	14.8	4.5	11.0	11.8	26.5	0.4	31.0	41,429
New Labour Supply	8.2	1.2	7.3	9.2	10.8	39.2	24.1	32,419
Labour Shortages*	16.0	6.8	10.2	9.0	34.6	-	23.4	-21,579
Registered Unemployed	0.0	0.0	8.3	1.9	3.9	4.2	81.7	4,490
Index of Labour Shortages (ε)	1.26	3.23	0.77	0.57	2.60	-	0.13	

Central Macedonia

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	19.5	7.3	10.9	12.1	18.6	0.3	31.3	147,636
New Labour Supply	13.7	2.6	9.4	12.0	9.8	22.1	30.4	66,473
Labour Shortages*	20.6	9.4	10.3	10.4	22.0	-	27.3	-95,373
Registered Unemployed	10.1	0.0	12.3	5.0	7.4	1.4	63.8	17,322
Index of Labour Shortages (ε)	1.28	3.05	0.78	0.70	1.97	-	0.34	

TABLE A3 (continued)

Western Macedonia

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	15.8	5.1	9.3	10.2	17.9	2.1	49.6	22,040
New Labour Supply	10.3	1.7	7.9	9.1	9.1	26.4	35.5	16,951
Labour Shortages*	19.0	9.0	7.6	7.9	26.6	-	29.9	-9,087
Registered Unemployed	6.0	0.0	5.1	1.9	1.9	1.1	84.0	4,008
Index of Labour Shortages (ε)	0.9	2.46	0.42	0.39	1.64	1.1	0.08	

Epirus

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	21.1	3.7	8.1	8.6	25.2	2.2	31.1	21,370
New Labour Supply	14.1	1.3	7.1	7.4	12.2	30.9	27.0	13,979
Labour Shortages*	22.6	5.5	6.7	7.1	32.6	-	25.5	-11,253
Registered Unemployed	10.3	0.0	12.8	3.3	9.6	0.0	64.0	2,711
Index of Labour Shortages (ε)	1.00	2.38	0.47	0.53	1.94	-	0.24	

Thessaly

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	18.7	3.3	9.1	10.8	22.8	0.1	35.2	50,304
New Labour Supply	11.5	1.0	6.7	9.2	10.2	32.5	28.9	33,175
Labour Shortages*	20.0	4.8	8.4	8.6	29.0	-	29.2	-27,866
Registered Unemployed	16.0	0.0	13.4	4.7	6.8	0.2	58.9	5,142
Index of Labour Shortages (ε)	1.07	2.84	0.68	0.56	2.19	-	0.35	

TABLE A3 (continued)

Ionian Islands

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	13.7	4.9	12.5	10.9	31.1	1.3	25.6	16,328
New Labour Supply	9.5	1.7	10.7	9.9	15.2	29.7	23.3	8,807
Labour Shortages*	14.0	6.6	11.0	9.1	37.7	-	21.6	-9,923
Registered Unemployed	1.4	0.0	14.4	2.6	58.3	1.3	22.0	3,092
Index of Labour Shortages (ε)	1.04	2.55	0.61	0.61	1.04	-	0.57	

Western Greece

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	20.8	5.4	12.7	11.5	20.8	-0.6	29.4	47,881
New Labour Supply	13.0	1.7	9.4	9.6	9.7	32.1	24.5	33,588
Labour Shortages*	22.1	8.0	11.4	8.9	26.5	-	23.1	-25,334
Registered Unemployed	12.7	0.0	22.0	0.0	9.4	0.6	55.3	3,352
Index of Labour Shortages (ε)	1.06	2.80	0.59	0.57	1.87	-	0.31	

Central Greece

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	14.5	4.1	10.6	9.4	21.4	1.0	39.0	35,025
New Labour Supply	8.6	1.2	8.0	8.1	9.3	34.2	30.6	22,512
Labour Shortages*	15.8	5.8	9.7	7.4	27.2	-	34.1	-19,869
Registered Unemployed	7.0	0.0	21.3	4.7	7.2	1.6	58.2	2,594
Index of Labour Shortages (ε)	1.19	3.01	0.61	0.55	2.20	-	0.42	

TABLE A3 (continued)

Attica

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	21.5	8.2	17.0	11.1	17.8	0.0	24.4	417,433
New Labour Supply	19.6	3.8	19.0	14.0	12.1	1.3	30.2	159,046
Labour Shortages*	22.5	10.8	15.7	9.3	21.2	-	20.5	-260,689
Registered Unemployed	16.9	0.5	22.9	11.9	10.0	0.0	41.8	25,277
Index of Labour Shortages (ε)	1.16	3.09	0.74	0.58	1.73	-	0.43	

Peloponnese

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	14.6	7.0	11.3	10.3	25.6	0.8	30.4	37,699
New Labour Supply	8.0	2.0	7.5	7.8	10.3	41.0	23.4	26,305
Labour Shortages*	15.5	9.8	10.4	8.3	31.7	-	24.3	21,891
Registered Unemployed	10.0	0.0	19.5	4.4	16.6	1.2	48.3	2,260
Index of Labour Shortages (ε)	1.24	3.25	0.75	0.67	2.29	-	0.43	

North Aegean

Occupational Composition (%)	One-digit Ocupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	20.3	3.1	11.8	14.4	27.0	-1.9	25.3	15,680
New Labour Supply	16.4	1.2	10.4	14.6	15.8	17.6	24.0	9,220
Labour Shortages*	19.9	4.4	10.7	10.9	33.2	-	20.9	-8,375
Registered Unemployed	11.1	0.0	23.4	3.9	16.8	2.6	42.2	1,250
Index of Labour Shortages (ε)	0.73	2.09	0.48	0.44	1.43	-	0.34	

TABLE A3 (continued)

South Aegean

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	12.3	3.2	9.2	10.7	39.4	0.2	25.0	25,337
New Labour Supply	10.3	1.4	10.6	13.6	25.3	7.4	31.4	12,784
Labour Shortages*	13.3	4.6	7.4	7.2	50.3	-	17.2	-13,450
Registered Unemployed	0.0	0.0	15.5	6.7	62.5	0.0	15.3	2,465
Index of Labour Shortages (ε)	0.81	1.87	0.34	0.29	0.83	-	0.30	

Crete

Occupational Composition (%)	One-digit Occupations							Absolute Figures
	01	2	3	4	5	6	7/8/9	
Labour Requirements	15.3	6.6	12.1	10.7	28.5	0.1	26.7	36,253
New Labour Supply	8.6	1.9	8.3	8.4	12.0	40.5	20.3	29,791
Labour Shortages*	16.2	9.9	10.2	7.4	36.6	-	19.7	-18,499
Registered Unemployed	8.0	0.0	20.5	4.8	44.3	2.4	20.0	3,187
Index of Labour Shortages (ε)	1.08	3.06	0.58	0.48	1.44	-	0.51	

* Labour shortages refer to the non-agricultural sectors of the economy.

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