

**DECOMPOSING INEQUALITY
BY POPULATION SUBGROUPS IN GREECE:
RESULTS AND POLICY IMPLICATIONS**

By

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ABSTRACT

This paper investigates the extent to which certain social characteristics and personal attributes could help explain income inequality in Greece. This analysis is quite revealing for understanding and explaining income differences among certain population subgroups with apparent policy implications. The degree to which overall inequality is attributable to inequality between these subgroups or to inequality within them is investigated, employing a decomposition analysis by population subgroups. The results show that there are significant differences in the average household income, in its structure and in inequality between the subgroups. However, despite these differences, in all groups used the between-group inequality accounts only for a small segment of the overall inequality.

Keywords: Inequality; income distribution; decomposition analysis; population subgroups; income sources; Greece.

JEL Classification: D31, D33, D63

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1 INTRODUCTION

Different characteristics of the income recipient unit have been looked upon as explaining a considerable part of existing income inequality. Empirical evidence appears to support the role that certain attributes may have in enhancing our understanding of income differences among persons. A number of theories also have emphasised the role of certain attributes in explaining the income disparities between people. To what extent, though, can certain characteristics of the unit of analysis help explain income inequality in Greece? The main hypothesis put forward is that an analysis based solely on the differences in household income between various population subgroups provides a restrictive view of overall inequality and could mislead its assessors. There would be apparent policy implications if this hypothesis were proven correct.

This paper aims to test the above hypothesis by initially investigating income differences of certain population subgroups. Estimates on the synthesis of household income concerning the contribution of each individual source are presented, in addition to attention directed to the differences of the average disposable income. That is because knowing the disparities in the structure of income between different household subgroups could prove quite revealing for understanding and explaining the existing income differences among the population subgroups. Previous work has delineated the importance of the distribution of income from certain sources to the overall inequality in Greece (Papatheodorou 1992, 1998a and 1998b). Policy analysts and policy makers could benefit greatly from such information in evaluating, designing, and implementing interventions to deal with inequality and poverty.

The question remains, however, as to the extent to which income differences between certain population subgroups can explain overall inequality. Limited research has been carried out in Greece on this topic, despite the apparent policy implications.¹ If inequality is mainly attributed to within-group inequality, it will come as no surprise if policies to reduce differences on average income between certain population subgroups are found to have limited or no effect on the overall inequality.

In an attempt to investigate these issues more thoroughly inequality is decomposed into within-group and between-group components. In order to compare the different aspects of inequality, a number of alternative indices are used, which also help us assess the robustness of the results.

2. THE DATA

The study uses the micro-data of the 1988 sample survey, conducted as part of the second European Antipoverty Programme by the Greek National Centre for Social Research.² This survey was designed to provide a national sample from the population resident in private households. Excluded from the sample were individuals living in institutions,

¹ Other known similar studies that attempted a decomposition analysis of inequality into between and within population subgroups in Greece were those of Carantinos (1981), Tsakloglou (1988) and Lazaridis et al (1989). They all analysed inequality using the information from Family Expenditure Surveys (FES). Carantinos (1981) used grouped data on household consumption from the 1974 FES and provided estimates on a limited number of population groups. Tsakloglou (1988) used micro-data on consumption from the 1974 and 1981/82 FESs (see also Tsakloglou 1989, 1993). Lazaridis et al (1989) used income and consumption expenditure micro-data from the 1981/82 FES.

² This survey was conducted by Yfantopoulos, J., Balourdos, D., Fagadaki, E., Kappi, C., Kostaki, A., Papaliou, O. and Papatheodorou, C. (Yfantopoulos *et al.* 1989, Deleeck *et al.* 1991). The data used in this study are the unpublished raw data.

health care units, hotels etc. Households with foreign members were included, providing they were in possession of a residence permit. The unit of analysis was the household and the general sample fraction was 1/1000 based on 1981 Population Census. The sample classification criteria were the Regional Developmental Areas (YPA) and the degree of Urbanisation (urban, semi-urban and rural areas). The total sample comprised 3,112 households. In 2,980 households interviews were successfully conducted (response rate 95.8%).³ Refusal to participate, absences or listing errors were the main reasons why interviews with the remaining households were not completed.

The household was defined as the group of people who live under the same roof, eat together and share a common budget. In the case of both married and cohabiting heterosexual couples, the head of household was assumed to be the man, except when he was seriously incapacitated. In all other cases, the head of household was named by the family members. Excluded from this analysis have been 30 households which did not fill in the questionnaire section on income. Finally, 10 more questionnaires were also excluded because of missing or insufficient information on some income components. Therefore, the total number of cases used in this analysis is 2,940.

The following concepts of income are used in this study:⁴

³ This response rate is considerably higher than similar surveys in other countries, as well as with the sample surveys of the rest of the countries in the framework of the same programme (Atkinson and Micklewright, 1983, Deleeck *et al.* 1991). Nevertheless, these high response rates are not unusual in Greece. Thus high response rates are also monitored in Greek Family Expenditure Surveys. The European Community Household Panel Survey also gives similar figures of non-response rate for Greece (Eurostat 1996). In addition, in this survey particular efforts were made in order to achieve a high response rate.

⁴ The concepts of income that are adopted in this analysis and the estimates of the relevant income variables for the whole country were based on the definitions and methodology used by Papatheodorou (1992). Additional data cleaning took place for the needs of this study (see also Papatheodorou 1998a, 1998b, 1999).

I. Pre-tax (gross) Income: This is the total household money income before (direct) taxes and social security contributions. Pre-tax Income is classified into six different sources:

- **Wages and Salaries:** This refers to incomes that the members of the household would receive if no deductions - taxes and social security contributions - had been made to their salaries/wages. In this source special annual "allowances" as well as bonuses that employees are entitled to, are also included.⁵
- **Entrepreneurial Income:** This refers to gross income from self-employment, freelance occupations or business activities.
- **Property Incomes:** This refers to rents, interests and shares. Imputed rent is not included.
- **Agricultural Income:** This refers to income that derives from agricultural activities. This is equal to gross revenues minus expenditures from any agricultural production. In this source, incomes from leasing of agricultural machinery, leasing of land, incomes from employment in agricultural activities as well as estimations of production for own consumption are also included.
- **Income from Social Security:** This is divided in two sources.
 - *Pensions:* This refers to gross primary and auxiliary (occupational) pensions, old age pensions, pensions for farmers, widows' and orphans' pensions etc. Private insurance pensions are not included.

⁵ According to Greek legislation employees are entitled to extra "allowances" given by their employers on annual basis. Thus for a full-time annual occupations these allowances are equal to two months wages or salaries.

- *Other*: This refers to various Family Allowances, Maternity Allowances, Illness Allowances, Work related Illness Allowances, Scholarships for poor children, Poverty Allowances etc.
- **Income from Other Sources**: This refers to income alimonies for former spouse and children, gifts in cash, remittances, fringe benefits etc.

II. Net (disposable) Income: This is the total household income after taxes and social security contributions.

All the types of incomes used in this study are calculated on an annual basis and they refer to the year 1988. This mainly refers to cash income. However, estimates of basic components of non-cash income such as production for own consumption for agricultural households, as well as, fringe benefits or imputed rent in entrepreneurial income are also included. The equivalence scale used in order to make comparable households with different composition is the scale C proposed by O'Higgins and Jenkins (1990) and recommended by OECD in its work on Social Indicators. According to this scale the first adult in each household has a weight of 1.0 and each additional adult a weight of 0.7 and each child of 0.5.

3 DISTRIBUTION OF INCOME ACCORDING TO HOUSEHOLD CHARACTERISTICS

One variable that has been extensively used by researchers in the field is that of household composition. As already mentioned, equivalent income is used in this analysis

in order to make households of different size and composition comparable. Since in this analysis the distribution of income according to the size and the composition of households is in question, additional estimates on total (non-equivalent) household income, and per capita disposable income are presented as well. The results are shown in Figure 1. We can see that, when we make no use of any equivalence scale there is a positive relationship between the number of household members and the average total disposable income, for up to four member households. Any additional member after the fourth was found to have a negative impact on overall income.⁶ Household income is positively but less than proportionately related to household size. In other words, any additional member increases the average per household income but reduces the per capita household income. This is in line with the findings of a number of relevant studies (e.g. Kuznets 1976). The per capita income appeared to have a negative relationship with household size, the only exception being households with three members the average income of which is almost equal to that of two-member households. Finally, the equivalent income is also associated negatively (but less sharply than the per capita income) with the size of a household. There is, of course, the exception of two-member households, the average equivalent income of which is lower than that of the household groups with three and four members.⁷

⁶ Only 14.5% of the households in our sample had more than four members (Table 1).

⁷ The sensitivity of the results to the measure of income used in assessing inequality in Greece was tested in Papatheodorou (1999), using the same data. There, I investigated the effect of alternative scales used for making households with different size and composition comparable. The results showed that the choice of scale may not have any significant effect on certain aggregate inequality indices, but it greatly affects the rank order of each particular household in the distribution, with apparent policy implications. Overall, based on the estimates provided by certain aggregate indices and summary measures, equivalent household income (OECD scale) appeared slightly more equally distributed than per capita and total (non-equivalent) income.

The composition of the household appears to be reflected not only in the total household income but also in its synthesis, as far as the contribution of each individual source is concerned. Therefore, the analysis by income source proved quite revealing in understanding and explaining particular issues of the distribution of income among these population subgroups. Table 1 presents the distribution of equivalent disposable income, gross income from various sources, and taxes and social security contributions by the size and the composition of household. We need to remember that in this study all men of 65 years and above and all women of 60 years and above are defined as “elderly”. All members below 16 years of age, as well as full time students below 25 who live with their parents are defined as “children”.

Figure 1: Average total, equivalent and per capita disposable household income by number of members per household.

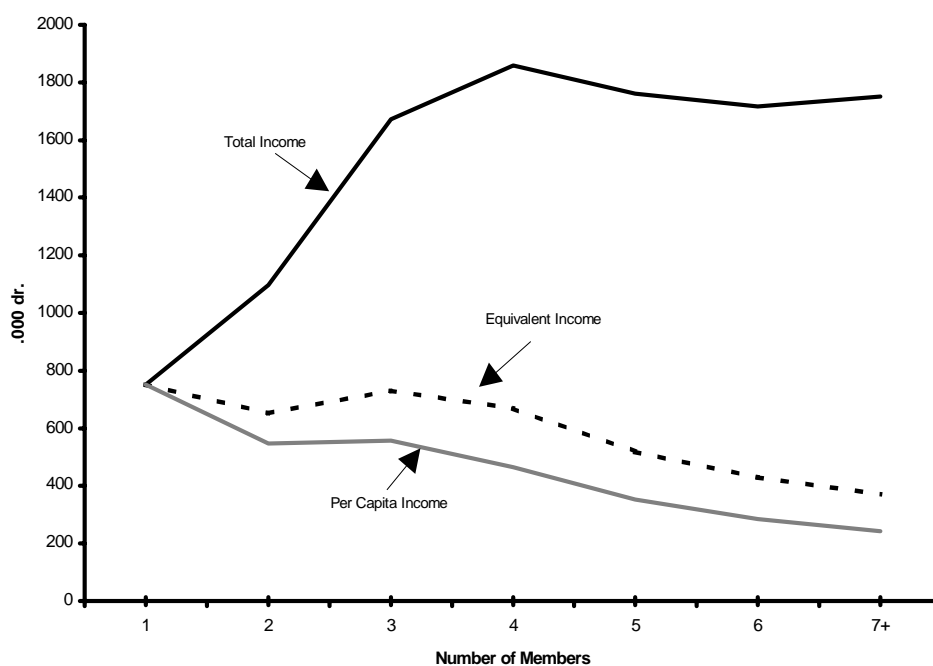


Table 1: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by household types.

Household Types	SOURCES OF INCOME										N	
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.		Average Disposable Equiv. Income
					Pensions	Other Trans.	Total					
a. Total average annual incomes (.000 dr.).												
1 MEMBER	261	98	41	37	284	3	287	100	824	73	752	356
1 adult	493	180	42	50	91	5	96	151	1011	108	903	185
1 elderly	9	10	40	23	493	1	493	46	622	35	588	171
2 MEMBERS	216	114	37	93	218	1	219	43	721	70	652	809
2 adults	378	196	42	150	117	1	119	23	908	101	807	360
2 elderly	4	19	33	43	367	0	367	24	489	24	465	245
1 ad. & 1 child	353	75	51	24	35	1	37	170	709	74	635	34
1 ad. & 1 eld.	173	94	24	65	279	2	281	25	661	77	584	149
Other	0	32	67	6	53	0	53	514	671	3	668	21
3 MEMBERS	326	195	29	97	128	3	130	37	815	84	730	634
3 adults	318	277	17	165	93	3	95	10	883	82	801	173
2 ad. & 1 child	480	219	27	54	58	3	61	27	869	107	762	240
1 ad. & 2 child.	214	23	34	17	89	3	92	329	709	60	649	33
2 ad. & 1 eld.	212	123	30	154	213	1	214	3	736	60	676	90
Other	104	114	52	59	296	3	298	43	669	62	607	98
4 MEMBERS	380	215	29	71	45	4	49	9	754	85	669	716
2 ad. & 2 child.	431	234	30	60	21	5	26	10	791	98	693	396
3 ad. & 1 child	368	121	26	75	54	2	56	4	650	76	575	94
4 adults	367	137	32	72	38	4	42	2	652	62	590	84
Other	256	271	26	95	111	4	116	17	779	67	712	142
5+ MEMBERS	187	114	16	132	71	3	74	5	529	48	481	425
2 ad. & 3 child.	278	189	29	77	20	4	24	4	602	75	527	87
2 ad. 1 elderly & 2 child.	125	84	11	206	136	1	137	1	564	40	525	42
Other	170	97	13	138	76	3	79	6	503	42	462	296
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940

Table 1 -continued

Household Types	SOURCES OF INCOME											N
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.	Average Disposable Equiv. Income	
					Pensions	Other Trans.	Total					
b. As percentage of gross household income (%)												
1 MEMBER	31.6	11.9	5.0	4.5	34.4	0.3	34.8	12.2	100	8.8	91.2	356
1 adult	48.8	17.8	4.2	5.0	9.0	0.5	9.5	14.9	100	10.7	89.3	185
1 elderly	1.5	1.7	6.4	3.8	79.2	0.1	79.3	7.4	100	5.6	94.4	171
2 MEMBERS	30.0	15.8	5.1	12.9	30.2	0.2	30.3	5.9	100	9.7	90.3	809
2 adults	41.7	21.6	4.6	16.5	12.9	0.2	13.1	2.5	100	11.1	88.9	360
2 elderly	0.7	3.8	6.8	8.8	74.9	0.0	74.9	5.0	100	5.0	95.0	245
1 ad. & 1 child.	49.7	10.6	7.2	3.4	5.0	0.2	5.2	23.9	100	10.4	89.6	34
1 ad. & 1 eld.	26.2	14.2	3.6	9.9	42.2	0.3	42.4	3.7	100	11.7	88.3	149
Other	0.0	4.7	9.9	0.8	7.9	0.0	7.9	76.6	100	0.4	99.6	21
3 MEMBERS	40.0	23.9	3.6	12.0	15.7	0.3	16.0	4.5	100	10.3	89.7	634
3 adults	36.0	31.4	2.0	18.7	10.5	0.3	10.8	1.1	100	9.2	90.8	173
2 ad. & 1 child	55.2	25.3	3.1	6.2	6.7	0.4	7.0	3.1	100	12.3	87.7	240
1 ad. & 2 child.	30.2	3.2	4.8	2.4	12.5	0.4	12.9	46.4	100	8.5	91.5	33
2 ad. & 1 eld.	28.8	16.7	4.1	20.9	29.0	0.1	29.1	0.5	100	8.2	91.8	90
Other	15.5	17.0	7.8	8.8	44.2	0.4	44.6	6.4	100	9.3	90.7	98
4 MEMBERS	50.5	28.6	3.8	9.4	6.0	0.6	6.6	1.2	100	11.2	88.8	716
2 ad. & 2 child.	54.5	29.6	3.8	7.6	2.7	0.6	3.2	1.2	100	12.4	87.6	396
3 ad. & 1 child	56.5	18.7	4.1	11.6	8.3	0.3	8.6	0.5	100	11.6	88.4	94
4 adults	56.2	21.1	5.0	11.0	5.8	0.7	6.5	0.2	100	9.5	90.5	84
Other	32.8	34.7	3.3	12.2	14.3	0.6	14.8	2.2	100	8.6	91.4	142
5+ MEMBERS	35.4	21.6	3.1	25.0	13.4	0.6	13.9	1.0	100	9.1	90.9	425
2 ad. & 3 child.	46.2	31.4	4.8	12.9	3.3	0.7	4.0	0.7	100	12.5	87.5	87
2 ad. 1 elderly & 2 child.	22.2	15.0	1.9	36.4	24.1	0.2	24.4	0.1	100	7.0	93.0	42
Other	33.7	19.2	2.7	27.5	15.2	0.6	15.8	1.2	100	8.3	91.7	296
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

The share of primary income (wages and salaries and entrepreneurial income) in total equivalent household income is positively associated with the number of members for the up to four-member households (Table 1b). By contrast, the share of income from social security and “other sources” was found to have exactly the opposite trend. Therefore, the lower the number of members, the higher are the shares of these sources in total household income. This is due to the fact that the households with one or two elderly, the incomes of which are mainly attributed to pensions, represent a significant part of the first two household groups.

As Table 1a shows, the highest total equivalent disposable income appeared in categories “1 adult”, “2 adults” and “3 adults”. Thus the elderly and children were found to have a negative effect on the total equivalent household income. Children are not usually entitled to any income (from labour) while the main source of income for the elderly are pensions, which are usually significantly lower than the incomes of the employed. Indeed, among the households with one member, the group of elderly was found to have on average an annual income equal to 588 thousand dr., while the relevant figure for adults is 903 (Table 1a). The main source of income for the elderly are pensions which represent 79% of their total gross income, while adults' main source of income are wages and salaries which represent 49% of their gross income, followed by entrepreneurial income with 18% (Table 1b). Therefore, 67% of adults' disposable income is considered as primary income.

Similarly, among the households with two members the category “2 adults” was found to have the highest average disposable income, followed by the groups “1 adult & 1 elderly”

and “1 adult & 1 child”. Finally, the lowest incomes in two-member households appeared in category “2 elderly”. The category “other” consists of 5 households with “1 elderly & 1 child” - a small number of cases that cannot be considered separately - and 19 households with two adults who are both below the age of 25 and are full-time students. It was decided that these 19 households would not be included in the category “2 adults”. As was noted, those below the age of 25 in full time education who live with their families are considered children by definition. These people live alone, but are financially dependent on their families. Therefore, it was a challenge to examine the structure of their income separately from the group of two adults. Indeed, it was found that this is the group of households with the highest share of income from other sources. Almost 77% of their total disposable income is attributed to “other sources” when the relevant figure for all households is found to be only 4.7%.

One comment that should be made is that the group of households that probably consist mainly of one-parent families was not found to have a particularly low disposable income, as evidence in other countries shows (see Layard et al 1978, George 1980, Piachaud 1982, Hauser and Fisher 1990, and Joseph Rowntree Foundation 1995). On the contrary, their income appeared to be quite close to the total average income for all households. These findings are in line with those of other studies in Greece. The analysis by income source helps to shed more light on this issue. The “income from other sources” was found to represent 46% of the total income for the group of households “1 adult & 2 children” and 29% for the group “1 adult & 1 child”. As already noted, “income from other sources” mainly refers to income alimonies for former spouse and children, remittances, gifts in cash etc. The above figures are significantly higher than the relevant

average for all households (4.7%). By contrast the proportion of income from social security in these two groups is much lower than the relative figure for all households. These two categories are usually headed by women, either because they are divorced or the husband has died (lone-parent families) or because the husband is an emigrant or seaman.⁸ The latter is a common feature of Greek society, bearing in mind that Greece experienced significant external migration during the 1960s and 1970s, since the available opportunities, particularly in the industrial sector, could not meet the labour supply. Similarly, a large number of Greeks are working as seamen, occupations that are usually associated with relatively high rewards. Thus a large proportion of the income of these households is attributed to alimonies for former spouse and children, and to remittances from emigrants or seamen.

Finally, the households with five or more members have the highest average proportion of rural income to total income than other household groups. Rural income represents 25% of their total income, where the relevant figure for all households is only 12%. It seems that large families are more common in rural areas. It is also appears that the categories “2 adults, 1 elderly & 2 children” and “2 adults & 1 elderly” are the subgroup with the highest shares of rural income. This indicates that the pattern of elderly (old parent) living with the family of his/her children and not alone, is more common in rural areas.

We have already highlighted part of the impact that children and the elderly have on total household income. It is meaningful to provide some additional evidence that should allow

⁸ Indeed, women headed 82% of households in these two groups, when the relative figure for all households is only 16.5 %.

us to clarify further this issue. Table 2 presents the distribution of household income by the number of children per household. The highest total equivalent income appeared in the group of households without children. This is also the only group the income of which is well above the relevant average figure for all households. It is, therefore, anticipated that households with children will have a lower equivalent disposable income than households without children will have. Among the households with children, those with 3 children constitute the group that has the higher equivalent disposable income. Despite that, the differences between the average income in all these categories are rather insignificant, with the exception of those households with four or more children. The average income of the latter group is substantially below the total average figure for all households.

Large differences also appeared in the synthesis of household income among these groups. As Table 2b shows, more than 70% of the average gross income of those households with children is attributed to wages, salaries, and entrepreneurial activities (primary income) when the relevant figure for all households is 59%. By contrast, the group of households without children is the only group that has a share of social security income that is substantially higher than the relevant figure for all households. This is because a significant part of this group consists of households with elderly members. The group with three children which, as already noted, has also the highest average income among the households with children, is the only group in which the entrepreneurial income is the main source of income. In fact, it is the only group in which entrepreneurial income is substantially higher than wages and salaries and more than double than the relevant figure for all households.

Table 2: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of children per household.

Number of Children per Household	SOURCES OF INCOME											N
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.	Average Disposable Equiv. Income	
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
0	239	130	32	96	213	2	215	35	746	70	676	1632
1	367	149	31	69	85	3	88	27	731	83	648	502
2	344	183	28	80	40	4	44	47	726	79	647	579
3	235	317	27	87	35	4	39	25	730	71	659	173
4+	231	126	15	85	40	3	42	5	504	53	450	54
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
0	32.0	17.4	4.4	12.8	28.5	0.3	28.8	4.7	100	9.4	90.6	1632
1	50.2	20.4	4.3	9.5	11.6	0.4	12.0	3.6	100	11.4	88.6	502
2	47.4	25.2	3.9	11.0	5.5	0.5	6.0	6.5	100	10.9	89.1	579
3	32.2	43.4	3.7	12.0	4.8	0.5	5.3	3.4	100	9.8	90.2	173
4+	45.8	24.9	3.0	16.9	7.9	0.5	8.4	1.0	100	10.6	89.4	54
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

Overall, we can say that among the households with one to three children - representing 96% of all households with children in our sample - the number of children appeared to be associated positively with the share of entrepreneurial and rural income. However, the number of children appeared to be associated negatively with the share of wages and salaries, property income and social security income. The category of households with four or more children is the one that has the highest average share of rural income. As we have also seen in table 1, large families were more commonly found in rural areas. The

relatively small number of cases in this group does not allow us a further classification and a more in-depth analysis. An additional comment that should be made is that in this table, as already discussed in Papatheodorou (1992), the percentages of taxes and social security contributions appeared also to be associated not with the total income, but with the share of wages and salaries in total gross household income.⁹

Finally, as Table 3 shows, the number of elderly people per household is negatively related to total equivalent disposable household income. As anticipated, the number of elderly per household has a positive relationship with the proportion of pensions to gross income and a negative relationship with the share of salaries and wages and entrepreneurial income (Table 3b).

One figure that is also important in investigating the distribution and the synthesis of household income is that of the number of income providers (see Deleeck et al 1991). Income provider is considered to be the member who earns incomes from wages or salaries, entrepreneurial activities, rural activities, property, pensions, and other social security transfers. As it is shown in Table 4, the lowest disposable equivalent income appeared in the group of households with no income providers. The only source of income for this group, as expected, was from “other sources” (Table 4b). This means that the incomes for these households are solely attributed to remittances, alimonies and so on.

⁹ The joint impact of tax and social security contributions and the impact of the benefit system on the income distribution in Greece are investigated in more detail in Papatheodorou (1998a, 1998b and 1999). The results showed that income taxes and social security contributions have a very weak distributional impact due to the high tax evasion, which is linked mostly to entrepreneurial activities. The benefit system in Greece also appeared to have a limited impact on the income distribution.

Table 3: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of elderly per household.

Number of Elderly per Household	SOURCES OF INCOME											N
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.	Average Disposable Equiv. Income	
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
0	380	204	31	91	63	3	67	42	815	89	725	1897
1	136	72	29	90	275	2	277	23	626	53	573	644
2+	42	51	34	69	309	2	310	19	525	33	492	399
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
0	46.7	25.0	3.8	11.1	7.8	0.4	8.2	5.2	100	11.0	89.0	1897
1	21.8	11.5	4.6	14.3	43.9	0.3	44.2	3.7	100	8.5	91.5	644
2+	8.0	9.7	6.5	13.2	58.8	0.3	59.1	3.6	100	6.3	93.7	399
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

The highest disposable income appeared in the group of households with two income providers. This is also the only group in which the share of wages and salaries in total household income is higher than the relevant figure for all households. Overall, the primary income in this group represents more than 65% of total household income. The households with one income provider have also a relatively high average disposable income. In fact, these two groups are the only groups with average disposable income higher than the relative figure for all households. These are also the groups with the highest primary income.

Table 4: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by number of income providers per household.

Number of Income Providers	SOURCES OF INCOME										N	
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.		Average Disposable Equiv. Income
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
0	0	0	0	1	0	2	2	547	551	7	544	72
1	253	179	44	37	188	3	190	36	739	73	665	1236
2	351	157	26	103	126	3	128	14	778	88	691	1175
3	234	121	15	201	99	3	101	7	680	54	626	312
4+	190	69	13	195	70	2	72	4	544	40	504	145
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
0	0.0	0.0	0.0	0.3	0.0	0.3	0.3	99.4	100	1.3	98.7	72
1	34.3	24.2	5.9	5.0	25.4	0.4	25.8	4.8	100	9.9	90.1	1236
2	45.1	20.2	3.3	13.2	16.1	0.3	16.5	1.8	100	11.3	88.7	1175
3	34.5	17.8	2.2	29.6	14.5	0.4	14.9	1.0	100	7.9	92.1	312
4+	35.0	12.6	2.4	35.9	12.9	0.3	13.3	0.8	100	7.3	92.7	145
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

The households with four or more income providers have the lowest average income. This is also the only group of households in which rural income becomes the main source of income. By contrast, the shares of entrepreneurial and social security incomes in this group are the lowest (among those households with income providers). Therefore, this group consists mainly of low-income farmers where almost all the adult members of the family are occupied in rural activities, or families whose members are in low-paid, part time or temporary jobs. Bearing also in mind the results of Table 1, where the large-size households were found to have the lowest equivalent income, we have to be rather

sceptical about the extent to which the presence of large families could be interpreted simply as a cultural phenomenon. An additional or alternative explanation is that large families are a necessity for those with low income, who pool their efforts and incomes in order to benefit from the economies of scales in consumption. Overall, among those households with income providers, the number of income providers is associated positively with the share of agricultural income in gross household income and negatively with the shares of entrepreneurial and social security incomes.

A lot of emphasis has also been placed by many researchers and policy-makers in the differences between certain household attributes and, in particular, the level of welfare, according to the degree of urbanisation (rural and urban areas). This is usually defined administratively by the size of the community, municipality or city to which the household belongs. The regional factor could, therefore, be considered as a household characteristic. According to the definition followed in the sample design, the households were grouped into three categories: urban areas, semi-urban and rural areas.¹⁰ As Table 5 shows, there are, indeed, significant differences in the average household income according to the degree of urbanisation. The households in urban areas had an average income well above the relevant figure for all households. The lowest disposable income appeared in rural households.

¹⁰ Urban areas: cities of 10000 inhabitants and over. Semi-urban areas: municipalities and communes of 2000-10000 inhabitants. Rural areas: municipalities and communes of less than 2000 inhabitants.

Table 5: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by locality.

Area	SOURCES OF INCOME											N
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.	Average Disposable Equiv. Income	
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
Urban	375	191	41	10	174	3	177	46	839	97	742	1817
Semi-urban	233	147	21	105	102	3	106	26	638	66	572	285
Rural	94	78	12	249	90	2	92	14	539	27	512	838
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
Urban	44.7	22.7	4.9	1.2	20.7	0.3	21.0	5.5	100	11.5	88.5	1817
Semi-urban	36.6	23.0	3.3	16.4	16.0	0.5	16.6	4.2	100	10.3	89.7	285
Rural	17.4	14.5	2.2	46.2	16.8	0.4	17.1	2.5	100	5.0	95.0	838
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

Significant differences are also observed in the synthesis of household income among these categories. Those living in urban areas have the highest share of wages and salaries in total household income. Overall, the primary income for this group represents more than 67% of the total income. By contrast, the share of rural income is only 1.2%. The main source of income for households in semi-urban areas is also wages and salaries, followed by entrepreneurial income. Rural income in this group also represents a relatively small proportion of total equivalent household income, although this share is above the average for all households. The households in rural areas are those with rural income as the main source of income. It is important to note that rural residences get much more rural income than wages. Indeed, in rural households, rural income appeared to represent more than 46% of the total average equivalent income, while the relevant

figure for wages and salaries found was only 17.4%.¹¹ One comment that should be made is that the households in semi-urban areas have an average income similar to that of households in rural areas, and a synthesis of income which is closer to that of households in urban areas. Therefore, the grouping favoured by some researchers according to which the households in semi-urban areas are classified as rural (based mainly on information about the average income), could obscure the analysis of inequality and could mislead policy interventions.

4 DISTRIBUTION OF INCOME BY ATTRIBUTES OF THE HEAD OF HOUSEHOLD

A number of social and demographic characteristics that are often used in investigating the distribution of household income are related to certain attributes of the head of household. The main reason for this is that the head of household is generally considered to be the main breadwinner. Given also the lack of sufficient information on other members, certain attributes of the head of household may serve as a fair proxy of the general social characteristics, as well the status of a whole household. Similarly, certain household characteristics (i.e. household income) may be also used as a proxy of individual characteristics (individual income) in investigating associations between particular individual attributes, when the data do not provide detailed information at an individual level. Thus despite the fact that these elements provide only a proxy of the attributes in question, they could prove to be helpful in analysing particular aspects of

¹¹ This could be explained by the high population share of farmers in Greece, who live mainly in rural areas (see Table 8)

inequality when there is insufficiency of detailed data. Those individual characteristics that are found to be associated with the distribution of income, and which have been used extensively in relevant studies are age, education, and occupational status of the head of household.

Table 6 presents the distribution of household income by the age of the head of household. The relationship between household income and age of the head of household has the shape of an inverted U. The average household income increases in the age group 25-34, remains high for the age groups 35-54 and then declines. This is similar to the results for the distribution of income by age of head of household in other countries (Atkinson 1983). The lowest incomes are observed at the age groups “under 25” and “65+”.

In the first age group (“under 25”) the adult is often unemployed or recently introduced into the labour market, with no experience and, therefore, with a salary or wages which are relatively low. This age group comprises also the full time students who do not live with their parents, but are financially dependent on them. Thus the income from “other sources” is the main income source in this group. It represents 43% of total gross income while the relevant figure for all households is only 4.7%. (Table 6b).

In those households where the head of household is older than 24, the head’s age is associated negatively with the share of wages and salaries. When the person is young, his/her main asset is his/her labour and thus the main sources of income are wages and salaries. As the head of household becomes older, the property (savings, investments) of

the household usually increases and thus the share of property income rises as well. Entrepreneurial income is an important contributor to the households in Greece with head in the age brackets “35-54”. It seems that in this age group adults are more competent in entrepreneurial activities and/or at this age they manage to maximise rewards from these activities.

Table 6: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by age of head of household.

Age of Head of Household	SOURCES OF INCOME										N	
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.		Average Disposable Equiv. Income
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
Under 25	283	53	20	24	28	2	29	308	718	50	668	102
25-34	493	167	18	56	28	6	34	53	821	108	713	417
35-44	424	225	18	73	28	2	30	25	795	93	701	570
45-54	320	214	36	135	73	4	76	16	798	79	720	659
55-64	185	138	40	123	203	1	204	16	707	63	644	606
65+	45	44	39	44	374	1	375	25	571	40	532	586
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
Under 25	39.5	7.4	2.8	3.3	3.9	0.2	4.1	43.0	100	7.0	93.0	102
25-34	60.0	20.3	2.2	6.8	3.5	0.7	4.2	6.4	100	13.1	86.9	417
35-44	53.4	28.3	2.2	9.2	3.5	0.3	3.8	3.1	100	11.8	88.2	570
45-54	40.1	26.9	4.5	16.9	9.1	0.5	9.5	2.0	100	9.8	90.2	659
55-64	26.2	19.5	5.6	17.4	28.7	0.2	28.9	2.3	100	9.0	91.0	606
65+	7.8	7.6	6.8	7.8	65.5	0.2	65.7	4.3	100	6.9	93.1	586
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

Rural income is associated positively with the age of the head of household (with the exception of course of the “65+” age group where the adult is usually retired). This is mainly attributed to three factors. First, older people usually own the larger and thus richer farms. This is because the young farmers usually inherit their farms from their parents and thus quite frequently they have to share them with other relatives (mainly brothers and sisters). Second, during the last three decades, there has been a rapid decrease of people occupied in rural activities. This reflects partly the changes in the structure of Greek production, and partly the substitution of labour by machines in agricultural production. In addition, due to low incomes - traditionally associated with rural activities - a large part of people moved to other activities. It is obvious that in both cases the younger are more flexible in moving out of rural activities and seeking a job in another sector. Third, also due to the low income in the agricultural sector, adult children - as already noted - often live with their parents (forming large families) and, therefore, benefit from pooling their efforts and from economies of scales in consumption.

Education is generally considered an important factor in explaining part of the dispersion in incomes.¹² As Table 7 shows the higher the educational level of the head of household, the higher is the household equivalent income. The income differences among household groups according to the educational level of their head are quite sharp. Thus the average disposable income for households the head of which had a university degree appeared two and a half times higher compared to those households the head of which had a “non-primary education”. Surprisingly, there are substantial differences between the

¹² Of course, human capital theorists have emphasised the role of personal education and training as the main determinant factor in explaining differences in earnings (Mincer 1958, 1974, Becker 1964). As already discussed in Papatheodorou 1997 and Papatheodorou and Piashaud 1998, my position is critical of

households with the head in “lower” and “upper cycle of secondary education”, as well as between those in “university” and “non-university higher education”. In particular, when the head of household had a “non-university higher education” the household income appeared significantly lower compared to that of those with a “university education” (72% as much). This is despite the fact that “non-university higher education” in Greece lasts only one year less (3 to 4 years) than “university education (4 to 5 years).¹³ These two groups of households have also significant differences in income profiles.

The households in which the head has a “non-university higher education” have also the highest share of wages and salaries (63%) in gross income (followed by those with “university education”). This is also the group that pays the higher percentage for taxes and social security contributions. However, the average wages and salaries are higher in the households in category “university education”. We may assume, therefore, that - as a group - those with university education spend fewer working hours on average, but earn more compared to what those with a “non-university higher education” earn.¹⁴ Therefore, it seems that “non-university higher education” has either failed to provide individuals with the right qualification, or that the structure of the Greek market (and society) does not value their degree in a way that would allow these individuals to gain rewards that would differentiate them from those who have only completed their secondary education. Indeed, there are no such sharp differences in total incomes between the households with

these theories because they fail to consider other important elements that affect one’s income (see also Atkinson 1983).

¹³ The difference in years (3 to 4 or 4 to 5) is related to choice of subject. Only studies in the medical school last up to 6 years.

¹⁴ Since the contribution of income from entrepreneurial activities in total income is considerably higher for those with “university education”, we could assume that on average, they spend less working hours as employees than those with “non-university higher education”.

the head in category “non-university higher education” and those in “upper cycle secondary school”, as well as between those in category “lower cycle school education” and those in “primary education”.

Table 7: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by the educational level of the head of household.

Education of Head of Household	SOURCES OF INCOME										N	
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.		Average Disposable Equiv. Income
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
University	710	374	79	16	140	2	142	44	1365	179	1186	241
Non University Higher Education	637	114	53	20	148	2	150	25	999	143	856	145
Upper Cycle Secondary School	370	174	46	35	175	3	178	80	884	109	775	613
Lower Cycle Secondary School	237	182	31	105	108	2	111	20	685	62	624	260
Primary Education	180	132	18	128	124	3	126	21	606	46	560	1147
No Primary Education	127	78	12	102	164	3	167	18	504	32	472	534
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940
b. As percentage of gross household income (%)												
University	52.0	27.4	5.8	1.2	10.2	0.2	10.4	3.3	100	13.1	86.9	241
Non University Higher Education	63.7	11.4	5.3	2.0	14.8	0.2	15.0	2.5	100	14.3	85.7	145
Upper Cycle Secondary School	41.9	19.7	5.2	3.9	19.8	0.4	20.2	9.1	100	12.3	87.7	613
Lower Cycle Secondary School	34.6	26.5	4.6	15.3	15.8	0.3	16.1	2.9	100	9.0	91.0	260
Primary Education	29.7	21.7	3.0	21.2	20.4	0.4	20.9	3.5	100	7.6	92.4	1147
No Primary Education	25.2	15.5	2.3	20.2	32.6	0.6	33.2	3.5	100	6.4	93.6	534
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940

Overall, there is a positive relationship between educational level and the average wages and salaries, as well as the property income. By contrast, the shares of rural and social security incomes are generally associated negatively with the educational level. It is obvious that the better-educated people are those who have better chances of abandoning rural activities, which are generally associated with low incomes. As also emphasised by a number of researchers, education in Greece has been seen as crucial in Greek society for upward social mobility (Tsoukalas 1986, Tsoukalas and Panagiotopoulou 1992).¹⁵ Finally, we have to note that the highest percentage of taxes and social security contributions appeared in those households with their head in the category “non-university higher education”. This category has also the highest share of wages and salaries in gross income.

Finally, the occupation of the head of household is often used as an important factor in analysing inequality of household income. It has also been used by a number of researchers as the main indicator in defining the social status of the households. Four occupational categories were used in the present analysis:

I : Professionals and Administrative Executives.

II : Clerical, Tradesmen and Salesmen.

III: Craftsmen, Labourers and Service Workers.

IV: Farmers

¹⁵ These issues were examined in more detail in Papatheodoru (1997) and Papatheodorou and Piachaud (1998).

Table 8 shows that household income varies significantly between these different occupational groups in Greece. Households with a head who was professional or administrative executive have by far the highest average household income followed by those in category “clerical, tradesmen and salesmen”. These are also the only groups with income above the relevant average figure for all households. The households with the head in categories “craftsmen, labourers and service workers” and “farmers” were those with the lowest average disposable income. The income differences between these groups are quite sharp. Thus the income of those households with the head in category I is two times higher than the income of households with a farmer head.

Also significant are the differences in the structure of household income among these groups. Those households with the head in category I have wages and salaries as the main source of income. The share of entrepreneurial income in this category, although it is above the relevant figure for all households, is lower than that in households in categories II and III. The other important element is that property income is higher in this group than in any other household group according to this classification.

The households with the head in category II are those with the highest proportion of entrepreneurial income to total income. This is mainly attributed to the fact that this group includes tradesmen (whose income is considered entrepreneurial). Despite that, wages and salaries are still the main source of income in this group, contributing by more than 50% to total household income. Those households in category III had also wages and salaries as their main income source. Entrepreneurial income is also a significant source of income for these households; despite the fact that it represents more than 31%

of total household income, its absolute amount is significantly lower than the relevant figures for those households in categories I and II. This, of course, is indicative of the different type of entrepreneurial activities in which the members of the families of these groups were involved. Members of households in category III are more likely to be involved in small enterprises (small shops etc) or self-employment occupations with low rewards.

Table 8: Equivalent gross household income from various sources, disposable income and taxes and social security contributions by occupational status of head of household.

Occupational Status of Head of Household	SOURCES OF INCOME										N	
	Wages & Salaries	Entrepr. Income	Proper. Income	Rural Income	Social Security			Other Sources	Average Gross Equiv. Income	Taxes & Social Secur. Contrib.		Average Disposable Equiv. Income
					Pensions	Other Trans.	Total					
a. Total average incomes (.000 dr.).												
I	746	352	59	15	23	3	27	35	1232	166	1066	297
II	514	377	34	18	46	1	47	23	1013	140	873	356
III	396	218	15	24	32	5	37	9	699	86	613	824
IV	53	38	11	366	62	2	63	7	539	12	527	567
TOTAL	281	154	31	87	143	3	146	35	734	74	660	2940*
b. As percentage of gross household income (%)												
I	60.5	28.6	4.8	1.2	1.9	0.3	2.2	2.8	100	13.5	86.5	297
II	50.8	37.2	3.4	1.7	4.6	0.1	4.6	2.3	100	13.9	86.1	356
III	56.6	31.2	2.2	3.4	4.6	0.7	5.2	1.4	100	12.3	87.7	824
IV	9.8	7.1	2.0	68.0	11.4	0.3	11.8	1.3	100	2.2	97.8	567
TOTAL	38.3	21.0	4.2	11.9	19.5	0.4	19.8	4.7	100	10.0	90.0	2940*

*It refers to total households of the survey and not to total households the head of which had an occupation. There are 896 households the head of which was found to have no occupation. These are mainly households headed by pensioners, unemployed, unoccupied, students etc.

I: Professionals and Administrative Executives.

II: Clerical, Tradesmen and Salesmen.

III: Craftsmen, Labourers and Service Workers.

IV: Farmers

Finally, the main source of income (68%) for those households the head of which is a farmer is rural income, as anticipated. It is also the only group in which none of the other sources was found to contribute in any significant way to household income. It seems, therefore, that the members of the households with a farmer head do not have the same chances to gain earnings from activities others than those in the rural sector, as we see happening in other groups. It appears that the majority of the members of these households are occupied in farming (family's farm), while occasionally some might work in a temporary or other relatively low paid occupation.

5. DECOMPOSING INEQUALITY BY POPULATION SUBGROUPS

We have investigated so far the differences in household incomes between certain population subgroups. It was found that particular social, demographic and regional characteristics could explain part of the differences in average levels of income, as well as in the structure of household income. These estimates, of course, do not tell us anything about how incomes are distributed within these population subgroups. Thus one question that is important concerns inequality within these household groups. Furthermore, from a policy perspective, it is important to know the extent to which the overall inequality is attributable to inequality between population subgroups, and the extent to which it is attributable to the inequality within them. Inequality within each group can simply be measured by one (or more) of the relevant indices. Although this allows us to compare the inequality among different population subgroups, it does not directly say much about the extent to which this inequality contributes to the overall

inequality. In order to investigate these issues, we need to be able to decompose inequality into within-group and between-group components. The between-group component is the inequality that would result if all units of each population subgroup had an income equal to the average income of the subgroup. The within-group component is the inequality that would remain if the average income in all groups were equalised but the inequality within each group remained unchanged. The within-group component is, therefore, the sum of the inequalities within each group, weighted by a coefficient that depends on certain aggregate characteristics. As Cowell (1995) has pointed out, an inequality index is decomposable if the total inequality can be expressed as an aggregate function of the inequality in each subgroup, of the mean income and of the population of each group (see also Cowell 1984). Thus the total inequality for any income distribution can be written as:

$$I_T = F(I_1, I_2, \dots, I_k; \mu_1, \mu_2, \dots, \mu_k; n_1, n_2, \dots, n_k)$$

where I_T is the overall inequality of the population, while I_k is the inequality in group k , μ_k is the mean income in group k , and n_k the population in group k .

Although a large class of inequality indices is decomposable by population subgroup, not all of them are suitable for this purpose.¹⁶ A number of authors have already discussed extensively the indices that are suitable and have the most desirable properties for this type of exercise (Bourguignon 1979, Cowell 1980, 1988, 1995, Shorrocks 1980, Anand

¹⁶ As Cowell (1988, 1995) showed, the relative mean deviation, the variance and the logarithmic variance cannot be decomposed based only on information on group means and populations. He also

1983). All inequality indices that are additively decomposable by population subgroup are members of the family of generalised entropy indices E_θ (Shorrocks 1984, Cowell 1995).¹⁷ This family of indices can be expressed in the form:

$$E_\theta = \frac{1}{\theta(1-\theta)} \left[\frac{1}{n} \sum_i \left[\frac{y_i}{\mu} \right]^\theta - 1 \right]$$

where θ parameter could take any positive, zero or negative value.

Each index of this family can be additively decomposed as:

$$I_T = I_B + I_w$$

where I_w is within-group inequality and I_B is between-group inequality.

The between-group inequality could be written as:

$$I_B = \frac{1}{\theta(1-\theta)} \left[\sum_K \frac{n_k}{n} \left(\frac{\mu_k}{\mu} \right)^\theta - 1 \right]$$

and the inequality within-group as:

showed that the Gini coefficient is decomposable only if the subgroups are not overlapping but are strictly ranked by income.

¹⁷ Cowell (1995) also shows that another class of indices that is decomposable by population subgroup is that of Kolm indices.

$$I_w = \sum_K \left(\frac{n_k \mu_k}{n \mu} \right)^\theta \left(\frac{n_k}{n} \right)^{1-\theta} I_k$$

where $\frac{n_k}{n}$ is the population share of group k and $\left(\frac{n_k \mu_k}{n \mu} \right)$ is, therefore, the share of income of group k in total income of the population.

The same results might not be necessarily derived using alternative inequality indices. Each of these indices has particular properties and is more sensitive to differences at different parts of the distribution. The use of a number of alternative indices could prove particularly helpful in revealing different aspects of the issue. It also helps to see if and how the relative contribution of within-group and between-group components is affected by the inequality index. It could thus serve as a test for the robustness of the estimates in each decomposition exercise.

For measuring inequality within each group only, the Gini (G) index and Atkinson indices $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$ were used. These indices have been extensively used by researchers in the field and therefore would allow the (potential) comparison with the findings of other studies. $A_{(\varepsilon=2)}$ index is relatively more sensitive to differences at the bottom of the distribution than $A_{(\varepsilon=0.5)}$, while G is more sensitive to differences at the middle of the distribution. For the decomposition analysis of the inequality the Theil's Entropy index (T), the Mean Logarithmic Deviation (L), and, following Jenkins (1995), the Half the Squared Coefficient of Variation ($C^2/2$) were used. These are also the

inequality measures with the most desirable properties for the decomposition analysis and have widely been used in relevant studies (Bourguignon 1979, Jenkins 1995). These three indices are part of the family of Generalised Entropy measures $E_{(\theta)}$: T is the $E_{(1)}$, L is the $E_{(0)}$, and $C^2/2$ is the $E_{(2)}$. Among these indices, L is more sensitive to differences at the bottom of the distribution, whereas $C^2/2$ is more sensitive to differences at the top.

6 THE DECOMPOSITION OF INEQUALITY BY POPULATION

SUBGROUPS: MAIN FINDINGS

The analysis in Section 3 showed that the average income of households in rural and semi-urban areas was well below the relevant figures for all households. The differences in household income according to regional factors have been emphasised by a number of researchers and policy-makers. Indeed, one of the national as well as EU policy priorities during the last decades has been the reduction of the differences in certain macroeconomic indicators among the different geographic areas in Greece.

The analysis in Table 9 shows that the degree of urbanisation does not only affect the average amount and the synthesis of household income, but also the way that income is distributed among the households. All the inequality indices suggest that income inequality among the households in rural areas is much higher than the inequality in urban and semi-urban areas. The inequality in rural areas is substantially higher than the overall inequality. The values of G , $A_{(\varepsilon=0.5)}$ and $A_{(\varepsilon=2)}$ show that inequality in urban and

semi-urban areas is almost the same. The Half the Squared Coefficient of Variation ($C^2/2$) is the only index that showed large differences between inequality in urban and semi-urban areas.

Table 9: Decomposition of inequality by the locality of household.

Locality	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
Urban	0.618	742	0.347	0.107	0.341	0.256	0.212	0.587
Semi-Urban	0.097	572	0.344	0.096	0.353	0.199	0.205	0.238
Rural	0.285	512	0.426	0.154	0.511	0.350	0.331	0.608
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.272 (95.3)	0.245 (94.7)	0.580 (97.8)
Between-Group Inequality						0.013 (4.6)	0.014 (5.3)	0.013 (2.2)

(The contributions in percentages are in parenthesis)

These results are in line with those of other studies in the field which have also shown that, generally, inequality in rural areas in Greece is higher than in the urban (and semi-urban) areas (Pashardes 1980, Carantinos 1981, Athanassiou 1984, Tsakloglou 1989). Tsakloglou (1988, 1989), using data from the 1974 and 1982 Family Expenditure Surveys, found that inequality in urban areas does not vary substantially from inequality in rural areas. The estimates provided by him of Gini and $A_{(\varepsilon=2)}$ indices on 1974 data showed that inequality in urban areas is slightly lower than in rural areas. However, his

relevant estimates on 1982 data showed that inequality in urban areas was slightly higher. Part of the differences between Tsakloglou's findings and those of the present study could be attributed to differences in the methodology followed, regarding mainly the data used and the classification of households according to the degree of urbanisation. Tsakloglou used only two groups, incorporating households of the semi-urban areas to the rural areas group.¹⁸

The indices used in the decomposition of inequality between and within groups show that the between-group inequality accounts for only a small part of the overall inequality. None of the indices shows that more than 5.3% of the overall inequality is attributable to the between-group inequality. The highest contribution (97.3%) that the between-group component has to overall inequality was given by the $C^2/2$ and the lowest (94.7%) by the L . These results agree, in general, with those of Tsakloglou (1988, 1989), although his estimates of the contribution of the between-group inequality were found to be higher. Using Theil's T and N indices and the Variance of Logs, Tsakloglou estimated the contribution of between-group inequality to be between 9.6% and 10.7% for 1974 and between 9.0% and 9.3% for 1982. Two non-mutually exclusive explanations could serve to clarify these differences. First, these differences could be attributed to the differences in methodology between Tsakloglou's studies and this present analysis. Tsakloglou's analysis is based on household equivalent expenditure, he used different equivalence scales and - as we have already discussed - a slightly different classification of

¹⁸ Overall, the estimates showing that inequality in rural areas is higher than that in urban areas of Greece seem to be different to what studies in other countries show (Jain 1975). Pashardes (1980) and Tsakloglou (1989) argued that this could be partly explained by the fact that in this grouping the high income population living in suburban areas around big cities is usually included in the "rural areas" group. Since in the present study rural and semi-urban areas are distinguished, and yet inequality in rural areas still

households according to the degree of urbanisation. Second, these differences may be attributed to a possible narrowing of the differences in average household income between the rural and urban areas that took place during the years between the surveys used by Tsakloglou and by the present study. Tsakloglou's estimates for 1974 and 1982 also indicated a similar trend. Unfortunately, the lack of comparable data on household income for the past does not allow the verification of the two suggested explanations.

Surprisingly, the results of the decomposition analysis presented here are quite different from those of Carantinos 1981 who -like Tsakloglou (1989) - used data from the 1974 Household Expenditure Survey. Carantinos's estimates on Theil's T index showed that the between-group inequality accounts for 30% of the overall inequality. Part of these differences could be attributed to the fact that Carantinos used grouped data on consumption expenditure. As Tsakloglou (1989) has pointed out, using a limited number of expenditure classes, Carantinos's estimates on within-group inequality were "downwards biased", since the extreme high and low incomes had only a marginal effect on the means of expenditure classes. This, of course, also resulted in the estimated contribution of the between-group inequality being analogously high.

As already noted, over the last decades, national and EU policies placed an emphasis in reducing inequality between different regions in Greece. Table 10 shows that, indeed, there are substantial differences in average household income between the regions of the country. The inequality between these regions varies significantly. The estimates of all indices suggest that the highest inequality appeared in the regions of "Epirus" and

appears to be higher, the offered explanation does not seem convincing. Further investigation is needed in order to explain the high income inequality within rural areas in Greece.

“Central and West Macedonia” while the lowest in “Greater Thessaloniki” and in “Greater Athens”. These variations in inequality among the different regions are higher than the estimates provided by Tsakloglou (1988, 1989). This could be partly explained by the fact that Tsakloglou used household expenditure that usually appears more equally distributed than household income.

Table 10: Decomposition of inequality by the region of household.

Region	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
Greater Athens	0.369	751	0.317	0.083	0.316	0.176	0.174	0.227
East Mainland and Aegean Islands	0.115	626	0.389	0.125	0.486	0.258	0.279	0.318
West Mainland, Peloponnese and Ionean Islands	0.120	485	0.384	0.121	0.478	0.248	0.271	0.300
Greater Thessaloniki	0.087	572	0.256	0.053	0.217	0.105	0.113	0.109
Central and West Macedonia	0.089	646	0.485	0.215	0.545	0.590	0.425	2.105
East Macedonia and Thrace	0.059	595	0.402	0.137	0.422	0.312	0.284	0.523
Epirus	0.033	687	0.509	0.226	0.510	0.585	0.446	1.263
Thessaly	0.069	765	0.454	0.195	0.517	0.524	0.381	1.591
Crete	0.059	596	0.361	0.113	0.379	0.250	0.233	0.376
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.275 (96.4)	0.248 (95.8)	0.583 (98.3)
Between-Group Inequality						0.010 (3.6)	0.011 (4.2)	0.010 (1.7)

(The contributions in percentages are in parenthesis)

The decomposition analysis shows that only a small part of the overall inequality could be attributed to the inequality between regions. In particular, the relevant estimates, as far as the contribution of the between-group inequality to overall inequality is concerned, were 3.6% (T), 4.2% (L) and 1.7% ($C^2/2$). Therefore, more than 95% of the overall inequality is attributable to the inequality within these regions. The policy implication of these results is apparent. If the inequality between these regions were eliminated (as far as the average household income is concerned) but the inequality within each region remained the same, the overall inequality would not be reduced by more than 4.2%. Any policy not targeted at reducing income inequality within each region would only have a limited impact on reducing aggregate inequality.

These findings contradict the conventional belief of other researchers and policy-makers concerning the impact that income differences between regions have on the overall inequality in Greece (see Geronimakis 1970, Prodromidis 1975). The decomposition analysis by regions by Tsakloglou (1988), also stressed the small impact that the between-regions inequality has on aggregate inequality (see also Tsakloglou 1989). Despite that, his estimates for the contribution of between-regions inequality were 11.3%-13.3% for 1974 and 8.6%-8.9% for 1982, which are considerably higher than the estimates of the present analysis. Apart from other factors that we have already mentioned, this could also be partly attributed to a narrowing of the inequalities between these regions that took place during the period between these surveys. This trend is also suggested by Tsakloglou's results. The narrowing of these differences could be seen as an effect of the structural changes in the Greek economy and as an effect of the relevant

policies during this period.¹⁹ Finally, the results of this decomposition analysis are more or less in line with what similar studies in other countries show. Jenkins' (1995) estimates showed that, during the period 1971 to 1986, the between region inequality in the United Kingdom did not account for more than 4% of the overall inequality.

The analysis in Section 4 has already emphasised the differences in average amount, as well as in the synthesis of income between households according to certain attributes of the head of household. Table 11 provides estimates on the differences in inequality between and within households according to the age of the head of household. Inequality was found to vary substantially according to the age of household head. The estimates of all indices show that the households the head of which falls within the age bracket "45-54" constitute the group with the highest income inequality. This is also the group with the highest average income. The lowest inequality was estimated in those households the head of which is up to age 24.

The estimates of the indices used for the decomposition of inequality show that the within-group inequality accounted for more than 97.5% of the overall inequality. Therefore, even if the inequality on average household income between these groups were eliminated, the overall inequality would not be reduced by more than 2.5%. Tsakloglou (1988) also provides similar estimates for 1974 and 1982. The results of this analysis are also in line with Jenkins' (1995) estimates for the UK; his estimates showed that in 1986 the contribution of between-group inequality (according to the age of the

¹⁹ This, of course, does not mean that the inequality within each region has also been reduced. This inequality may well have increased.

head of household), accounted for not more than 4.5% of overall inequality in that country.

Table 11: Decomposition of inequality by the age of head of household.

Age of the head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\epsilon=0.5)}$	$A_{(\epsilon=2)}$	T	L	$C^2/2$
Under 25	0.035	668	0.272	0.065	0.309	0.125	0.145	0.129
25-34	0.142	713	0.327	0.091	0.412	0.185	0.204	0.219
35-44	0.194	701	0.355	0.105	0.361	0.228	0.219	0.326
45-54	0.224	720	0.425	0.168	0.490	0.440	0.333	1.319
55-64	0.206	644	0.374	0.122	0.456	0.271	0.258	0.439
65+	0.199	532	0.375	0.113	0.392	0.237	0.244	0.293
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.280 (98.0)	0.253 (97.7)	0.587 (99.0)
Between-Group Inequality						0.006 (2.0)	0.006 (2.3)	0.006 (0.9)

(The contributions in percentages are in parenthesis)

Differences in inequality were also found among the group of households according to the educational level of the head (Table 12). The estimates of all indices show that the highest inequality was observed in the group of households the head of which had no primary education. The lowest inequality was in the groups of households with the head in categories “non university higher education” and “upper cycle secondary education”. Only the estimate of $A_{(\epsilon=2)}$ index suggested that the group of households with the lower inequality was this in “university” category. This could provide us with additional

information about the different way that incomes are distributed within these groups. As already noted, $A_{(\varepsilon=2)}$ is more sensitive to income differences at the bottom of the distribution.

Table 12: Decomposition of inequality by educational level of head of household.

Education of the head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
University	0.082	1186	0.331	0.105	0.283	0.264	0.195	0.574
Non University Higher Education	0.049	856	0.293	0.077	0.313	0.165	0.161	0.235
Upper Cycle Sec. School	0.209	775	0.298	0.075	0.311	0.157	0.158	0.194
Lower Cycle Sec. School	0.088	624	0.332	0.093	0.372	0.192	0.200	0.236
Primary Education	0.390	560	0.367	0.117	0.391	0.268	0.240	0.491
Non Primary Education	0.182	472	0.399	0.153	0.466	0.416	0.301	1.792
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.247 (86.4)	0.223 (86.0)	0.550 (92.7)
Between-Group Inequality						0.039 (13.6)	0.036 (14.0)	0.043 (7.3)

(The contributions in percentages are in parenthesis)

Overall, the contribution of the between-group component to aggregate inequality in those groups that were formed according to the educational level of the head of household, was estimated to be 13.4% (T), 14.0% (L) and 7.3% ($C^2/2$). These were also the highest relevant estimates on the between-group component that have been found so

far. This signifies the role of education in income differences. Despite that, the elimination of income differences between these household groups would only have a limited effect on reducing the aggregate inequality. In other words, a policy that would eliminate differences in the average incomes among education categories, but would leave the income inequality among the households in each group unchanged, would reduce the overall inequality by no more than 14%.²⁰ These results do not, of course, support certain versions of human capital theories that emphasise the role of education as the main determinant factor of personal income.

Finally, differences in inequality were also observed according to the occupational status of the head of household (Table 13). Among the households with an occupied head, the highest inequality was found in those households the head of which was a farmer. These are also the households with the lower average income. We can assume that the inequality is higher mainly because of the differences among the farmers in Greece, as far as the quantity and quality of the land they own is concerned. This, of course, could also be added to the explanations provided in reference to the findings that inequality in Greece is higher in rural than in urban or semi-urban areas (see analysis of Table 5). The lowest inequality among those households with occupied heads was found in the group of “craftsmen, labourers and service workers”. The lowest inequality in all groups was found in the group of “students and unoccupied”. This group consists mainly of students and few small rentiers (who were too few to form a separate group).

²⁰ The relevant estimates provided by Tsakloglou (1988) are relatively larger. His estimates, concerning the between-group contribution, were 21.5-25.5% for 1974 and 17.4 -19.1% for 1982. He also found that the type of grouping and the number of categories also affect the between-group and within-group contributions. Lazaridis et al's (1989) estimates for 1982 on the within-group contribution to aggregate inequality in the groups formed according to educational level of the head of household were between 13-15%.

Table 13: Decomposition of inequality by occupational status of head of household.

Occupational status of head of household	$\frac{n_k}{n}$	μ_i	G	$A_{(\varepsilon=0.5)}$	$A_{(\varepsilon=2)}$	T	L	$C^2/2$
In occupation								
I	0.101	1066	0.346	0.118	0.352	0.300	0.225	0.757
II	0.121	873	0.376	0.124	0.366	0.303	0.244	0.693
III	0.280	613	0.323	0.091	0.319	0.205	0.184	0.351
IV	0.193	527	0.428	0.157	0.532	0.356	0.339	0.639
Not in occupation								
V	0.235	570	0.343	0.096	0.355	0.199	0.208	0.240
VI	0.023	625	0.226	0.041	0.157	0.084	0.085	0.091
VII	0.047	539	0.355	0.104	0.456	0.204	0.242	0.213
Total			0.377	0.124	0.431	0.286	0.259	0.593
Within-Group Inequality						0.256 (89.5)	0.231 (89.4)	0.560 (94.4)
Between-Group Inequality						0.030 (10.5)	0.028 (10.6)	0.033 (5.6)

(The contributions in percentages are in parenthesis)

- I : Professionals and Administrative Executives.
- II : Clerical, Tradesmen and Salesmen.
- III : Craftsmen, Labourers and Service Workers.
- IV : Farmers
- V : Retired
- VI : Students and unoccupied
- VII: Unemployed

Thus the within-group inequality component also dominates the between-group component in the groups formed according to the occupational status of the head of household. Despite that, the contribution of the between-group inequality is the largest found, except for that between the educational categories. However, more than 89% of the aggregate inequality is found to be attributable to within-group inequality. Any

attempt, therefore, to eliminate the between-group inequality, but leave the within- group inequality unchanged, would only reduce the overall inequality by no more than 10.6%.

7 CONCLUSIONS

The main aim of this paper was to test the hypothesis that an analysis based solely on differences in household income between (frequently used) population subgroups in Greece is rather restrictive for assessing the overall inequality. Analysis of inequality by population subgroups is considered a valuable tool for understanding and explaining income differences among persons, and as such it has often been used by researchers. This type of analysis has its merits when policy making is considered. It can help evaluate, formulate and implement efficient policy interventions in dealing with issues related to inequality and poverty.

The income differences between certain population subgroups were investigated first. Those groups were formed according to particular general characteristics of the household such as size, composition and degree of urbanisation, and according to certain attributes of the head of household such as education, age and occupation. Emphasis was put not only on the average total household income, but also on the differences in the synthesis of household income as far the contribution of each individual source is concerned.

Certain characteristics of the unit of analysis appear to significantly affect the average household income. The analysis by income source showed that there are also disparities in the structure of household income between different subgroups. This analysis helped to shed more light on income differences, and provided additional valuable information on household characteristics and profile. This information often proved quite important in understanding and explaining certain differences between population subgroups. Therefore, policy makers could be greatly helped in identifying priorities and in designing and implementing interventions.

Still, the previous analysis provides no information about the way in which the income is distributed within these population subgroups. From a policy perspective, it is crucial to know the extent to which the overall inequality is attributable to inequality between these subgroups and the extent to which it is attributable to inequality within them. In order to investigate this issue, inequality was decomposed into within-group and between-group components. A number of alternative indices were used in order to capture the different aspects of the inequality and to serve as a test for the robustness of the estimates in the decomposition exercise.

The results show that income inequality varies significantly among different population subgroups. When decomposition analysis was employed, it was found that in all groups used the between-group inequality accounts only for a very small part of the overall inequality. Reducing inequality between the household groups would have only limited effect on reducing the overall inequality. In particular, the analysis according to the degree of urbanisation showed that no more than 5.3% of the overall inequality is

attributable to the between-group component. The relevant figure for the inequality between regions is 4.2%. This estimate is even lower for the group formed according to the age of the head of household. By contrast, the highest estimate on the between-group component, with 7.3-13.4%, were found in those groups formed according to the educational level of the head of household. Household groups that were formed based on the occupational status of the head of household also showed a relatively high contribution of the between-group components to overall inequality. Still, of course, any attempt to eliminate the between-group inequality, but leave the within-group inequality unchanged, would not have any significant effect on the aggregate inequality. It is apparent what the policy implications of these findings are. Any policy which is not targeted at reducing inequality within each of the above household groups would have a limited impact on reducing overall inequality.

References

- Anand, S. (1983). *Inequality and Poverty in Malaysia: Measurement and Decomposition*. Oxford: Oxford University Press.
- Athanassiou, L. (1984). *The Distribution of Income in Greece*. Scientific Studies 6. Athens: Centre for Planning and Economic Research (in Greek).
- Atkinson, A. B. (1983). *The Economics of Inequality*, 2nd edn. Oxford: Clarendon Press.
- Atkinson, A. B., and Micklewright, J. (1983). On the reliability of income data in the Family Expenditure Survey 1970-1977. *Journal of the Royal Statistical Society*, **146**, 33-61.
- Becker, G. S. (1964). *Human Capital*. New York: Columbia University Press. (3rd edn. 1993. Chicago: The University of Chicago Press).
- Bourguignon, F. (1979). Decomposable income inequality measures. *Econometrica*, **47**, 901-920.
- Carantinos, D. T. (1981). Aspects of income and wealth distribution in Greece. Unpublished PhD thesis, Department of Economics, University of Strathclyde.
- Cowell, F. A. (1980). On the structure of additive inequality measures. *Review of Economic and Statistics*, **47**, 521-531.
- Cowell, F. A. (1984). On the structure of American inequality. *Review of Income and Wealth*, **30**, 351-375.
- Cowell, F. A. (1988). Inequality decomposition: Three bad measures. *Bulletin of Economic Research*, **40**, 309-312.
- Cowell, F. A. (1995). *Measuring Inequality*, 2nd edn. London: Prentice Hall/Harvester Wheatsheaf

- Deleeck, H., van den Bosch, K. and De Lathouwer, L. (1991). *Indicators of Poverty and Adequacy of Social Security: Methodological Considerations and Comparative Results for Seven Countries. Final Report, Second Specific Community Action to Combat Poverty*. Centre for Social Policy, University of Antwerp.
- Eurostat (1996). *The Household Panel Newsletter*. Theme 3, Series B, Issue 1. Brussels: ECSC-EC-EAEC,
- George, V. (1980). Poverty and inequality in the UK. In V. George and R. Lawson (eds), *Poverty and Inequality in Common Market Countries*. London: Routledge and Kegan Paul.
- Geronimakis, S. (1970). Unequal distribution of income in post-war Greece. *Statistician*, 7, 3-23 (in Greek).
- Hauser, R. and Fisher, I. (1990) Economic well-being among one-parent families. In M. Smeeding, M. O'Higgins, and L. Rainwater (eds), *Poverty, Inequality and Income Distribution in Comparative Perspective*. London: Harvester Wheatsheaf.
- Jain, S. (1975). *Size Distribution of Income: A Compilation of Data*. Baltimore: Johns Hopkins University Press.
- Jenkins, S. P. (1995). Accounting for inequality trends: Decomposition analyses for the UK, 1971-86. *Economica*, **62**, 29-63.
- Joseph Rowntree Foundation (1995). *Joseph Rowntree Foundation Inquiry into Income and Wealth*, vol. 1 (by P. Barclay) and 2 (by J. Hills). York: Joseph Rowntree Foundation.
- Kuznets, S. (1976). Demographic aspects of the size distribution of income: An exploratory essay. *Economic Development and Cultural Change*, **24**, 1-94.

- Layard, D., Piachaud, D. and Stewart, M. (1978). *The Causes of Poverty*. Background Paper 5, Royal Commission on the Distribution of Income and Wealth. London: Her Majesty's Stationery Office.
- Lazaridis, P., Papailias, T. and Sakelis, M. (1989). *Distribution of income in Greece*. Studies on Agricultural Economy 35. Athens: The Agricultural Bank of Greece.
- Mincer, J. (1958). Investment in Human Capital and Personal Income Distribution. *Journal of Political Economy*, **66**, 281-302.
- Mincer, J. (1974). *Schooling, Experience and Earnings*. New York: Columbia University Press.
- O'Higgins, M. and Jenkins, S. (1990). Poverty in the EC: Estimates for 1975, 1980 and 1985. In R. Teekens, and B. M. S. Van Praag (eds), *Analysing Poverty in the European Community*. Luxembourg: Eurostat.
- Papatheodorou, C. (1992). Income distribution in Greece; results of the 1988 sample survey. Unpublished MSc thesis, School of Social Sciences, University of Bath.
- Papatheodorou, C. (1997). *Poverty and Family Background in Greece: The Role of Father's Occupation and Education*. Discussion Paper WSP/133, Welfare State Programme, LSE-STICERD, London School of Economics and Political Science.
- Papatheodorou, C. (1998a). *Inequality in Greece: An Analysis by Income Source*. Discussion Paper DARP 39, Distributional Analysis Research Programme, LSE-STICERD, London School of Economics and Political Science.
- Papatheodorou, C. (1998b). *Income Inequality and Development in Greece: A Decomposition Analysis*. Working Paper 1998/4, Institute of Social Policy. Athens: National Centre for Social Research.

- Papatheodorou, C. (1999). Dimensions of Income Inequality in Greece. Unpublished PhD thesis, London School of Economics and Political Science, University of London.
- Papatheodorou, C. and Piachaud, D. (1998). Family background, education and poverty in Greece. In K. Korayem and M. Petmesidou (eds), *Poverty and Social Exclusion in the Mediterranean Area*. Bergen: CROP.
- Pashardes, P. (1980). Income redistribution as a development policy: The case of Greece. Unpublished PhD thesis, Birkbeck College, University of London.
- Piachaud, D. (1982). *The Distribution and Redistribution of Income*. London: Bedford Square Press.
- Prodromidis, K. (1975). Regional distribution of occupation and income in Greece. *Spoudai*, **25**, 529-550 (in Greek).
- Shorrocks, A. F. (1980). The class of additively decomposable inequality measures. *Econometrica*, **48**, 613-625.
- Shorrocks, A. F. (1984). Inequality decomposition by population subgroups. *Econometrica*, **52**, 1369-1385.
- Tsakloglou, P. (1988). Aspects of inequality and poverty in Greece: 1974, 1982. Unpublished PhD thesis, University of Warwick.
- Tsakloglou, P. (1989). Measurement and decomposition of inequality by population subgroups: A survey and an example. *Spoudai*, **39**, 23-47.
- Tsakloglou, P. (1993). Aspects of inequality in Greece: Measurement, Decomposition and Intertemporal Change: 1974, 1982. *Journal of Development Economics*, **40**, 53-74
- Tsoukalas, C. (1986b). *State, Society and Work in Post-war Greece*. Athens: Themelio (in Greek).

- Tsoukalas, C. and Panagiotopoulou, R. (1992). Education in socialist Greece: Between modernisation and democratisation. In T. C. Kariotis (ed.), *The Greek Socialist Experiment*. New York: Pella.
- Yfantopoulos, J., Balourdos, D., Fagadaki, E., Kappi, C., Kostaki, A., Papaliou, O. and Papatheodorou, C. (1989). *Poverty and Social Indicators in Greece*. Report submitted to EC, DGV. Athens: National Centre for Social Research.