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Inequality and Poverty in retirement age groups: an analysis for Portugal

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Abstract

In recent years, political agenda in the European Union has been concerned with problems related to population ageing, namely the long-term sustainability of public finances in addressing social issues.

This study addresses social issues among the elderly in Portugal, namely income distribution, inequality, poverty and the adequacy of social assistance policies. It concludes that households in the "older" age group have relatively less income and consume relatively less than households in "younger" age groups. The main source of income for this age group is social transfers.

Inequality indicators show that inequality is higher among the elderly and geographical differences seem to weight more on total inequality than other factors. Likewise, there are also relatively more poor among the elderly and this is more significant for non-working households and households living in rural areas. Social assistance policies contribute to poverty reduction.

Sumário

Nos últimos anos, o programa político na União Europeia tem revelado particular preocupação com os problemas relacionados com o envelhecimento da população, designadamente a sustentabilidade de longo prazo das finanças públicas na resolução de problemas sociais.

Este estudo aborda questões sociais relativas aos mais idosos, em Portugal, nomeadamente a distribuição do rendimento, a desigualdade, a pobreza e a adequabilidade das políticas de assistência social. Assim, conclui que agregados familiares no grupo etário mais elevado têm relativamente menos rendimento e consomem relativamente menos do que agregados familiares nos grupos etários inferiores. A principal fonte de rendimento deste grupo etário são as transferencias sociais.

Os indicadores de desigualdade mostram que a desigualdade é mais elevada para os mais idosos e as diferenças geográficas parecem pesar mais na desigualdade total do que outros factores. Do mesmo modo, existem relativamente mais pobres entre os mais idosos, resultado que é mais significativo nas zonas rurais e para os agregados familiares ausentes do mercado de trabalho. As políticas de assistência social contribuem para a redução da pobreza.

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1. Introduction

In recent years, political agenda in the European Union has been concerned with problems related to population ageing and priority has been given to the reform of the Member States' Social Security Systems. In this context, the main issues addressed are the long-term sustainability of public finances, namely public expenditure with pensions, health care and support to the elderly, along with the prosecution of social goals. This was particularly outlined in the Barcelona Council, held in March 2002, where, in order to address the challenge of the ageing population, the European Council asked for " the reform of pension systems to be accelerated to ensure that they are both financial sustainable and meet their social objectives".

This study is mainly concerned with social issues among the elderly, namely the adequacy of income, the analysis of inequality and poverty and the adequacy of social assistance policies. In section 2 a brief description of data used is made; section 3 is divided in three sub-sections: first subsection addresses income and consumption distribution, second subsection analyses inequality and third subsection concerns poverty issues; section 4 analyses the adequacy of social assistance policies. In section 5 concluding remarks on the study are presented.

2. Household income survey

Data used in this analysis is taken from the Household Income Survey[1], which is conducted by INE every five years. In this sample, each household is inquired during a fortnight on expenditure, income, taxes and other socio-economic elements such as dwelling conditions, place of residence, professional status, etc. The resulting values are adjusted to one year. All variables concern the Survey year (2000) except for income, which concerns the previous year (1999). The Survey includes a probabilistic sample of 10020 households.

3. Income distribution, Inequality and poverty

This section is divided in three sub-sections: income and consumption expenditures distribution, inequality and poverty.

In the first sub-section the analysis of income and expenditure distribution is concerned with relative income and consumption expenditures (averages of households in "older" age groups as percentage of averages of households in "younger" age groups), income sources,

[1] To estimate the values in tables 24 and 25 the National Centre for Pensions database was used.

expenditures by goods and services. Some specific issues are also considered, such as household types and regional asymmetries.

In the following sub-section, concerning inequality, the main inequality indices are presented. The Theil indices are decomposed by subgroups, in order to conclude on the importance of age, family type, regional location and working status on inequality. The Gini index is decomposed by factor components considering both income and consumption expenditures.

The decomposition of inequality by subgroups expresses an inequality measure as the sum of within-group inequality and between-group inequality. Indices that can be expressed this way are additively decomposable. The additive decomposability assumption imposes a severe restriction on the form of inequality measures: Shorrocks (1980) shows that the only admissible indices belong to the single parameter Generalised Entropy (GE) measures:

$$G(\alpha) = \frac{1}{n}\frac{1}{\alpha(\alpha-1)}\sum_i\left[\left(\frac{Y_i}{\mu}\right)^{\alpha} - 1\right] \qquad \textbf{(1)}$$

n - Total population

μ - Income average

Y_i - Income of individual I

The Gini index is only decomposable if the subgroups of the population do not overlap in the vector of incomes. The Atkinson inequality measures are decomposable (Cowell (1995) shows that the Atkinson class of measures are equivalent to the GE class of measures), but the two components do not sum to total inequality. Thus the measures used are the particular cases for GE class measures, $\alpha=0$ and $\alpha=1$ (Theil indices).

Weights of GE class measures used in decomposition by subgroups have the general form

$$\frac{n_g}{n}\left(\frac{\mu_g}{\mu}\right)^{\alpha} \qquad \textbf{(2)}$$

μ_g - Average income of group g

n_g - Population in group g

In the particular case presented, when $\alpha=0$ the weight is population share, while when $\alpha=1$ the weight is income share. In the first case the index is strictly additive, since making hypothesis on income does not affect between-group inequality; for $\alpha=1$ the index is weakly additive, since hypothesis on income affects between group inequality.

Decomposition by income factor is independent of the index chosen, as proved by Shorrocks (1982). The results presented in this work are for the Gini index.

In the third sub-section, poverty of households in "older" age groups are analysed. The poverty measures used are the Foster-Greer-Thorbecke (FGT) measures, which are used to compare age groups, family types, regional location and working status.

To analyse these three aspects (income and expenditures by goods and services, inequality and poverty), households will be mainly divided by age groups, age referring to the age of the household representative. The following age groups are considered: 16 to 24 years old, which includes mostly individuals searching for a first job; 25 to 39 years old and 40 to 54 years old; 55 to 64 years old, which represents individuals in pre-retirement; 65 to 74 years old and over 75 years old, which includes mostly retired individuals.

The "older" age groups are in turn divided to analyse particular issues: household type (single vs. couple), regional location and working status. Again, most of these features refer to the household representative.

3.1. Income and consumption expenditures distribution

One of the issues arising from the study of inequality is which variable to use in order to analyse well-being. Wealth, representing all resources available to an individual, would be the best variable to use. However, insufficient information makes it very difficult to quantify wealth.

The other options, considered in most studies, are income and consumption expenditures, which can be interpreted as changes in resources- available, in the first case, and used, in the second. Two main arguments favour the use of consumption expenditures: first, data collection problems in surveys suggest that both variables are under-estimated but income is relatively more under-estimated; second, it is through consumption that individuals gain utility and thus consumption is a measure of actual utility. Most studies, however, consider it more interesting

to analyse income, the choice of this variable being supported by the fact that it is a measure of all resources available to individuals and not only those they chose to use.

This work uses both income and consumption expenditures as measure of well-being.

Income

In this section the well-being of individuals will be measured considering monetary income. Monetary income corresponds to household income (dependent employment, self employment, rents, capital income, pensions, periodical and non-periodical benefits) net of taxes (on labour, on real estate and social transfers) and other payments (housing interests, mortgages, payments, penalties and fines). This analysis also considers equivalence scales. Indeed, the comparison of income should consider both the household dimension as well as the existence of scale economies. Thus income will be divided by a factor, which takes into account both these elements, designated equivalence scale. The equivalence scale used is the modified equivalence scale defined by OECD (Organization for Economic Co-operation and Development), which weights the first adult by one, the remaining adults by 0.5 and children under 16 years old by 0.3.

In **table 1**, households were divided by the age groups mentioned above and the ratio between the mean income[2] of age groups 65-74 and >75 and the mean income of other age groups is presented. Furthermore, each age group was also divided by income quintiles, which were calculated for each age group separately. Ratios for each income quintile are also presented in **table 1**.

Table 1. Mean disposable income of people aged 65 and over, as percentage of mean disposable income of people aged 16-64

	65-74				**>75**			
	16-24	***25-39***	***40-54***	***55-64***	***16-24***	***25-39***	***40-54***	***55-64***
1	66.60	80.72	76.38	85.74	59.17	71.72	67.86	76.17
2	79.84	74.39	69.97	73.22	67.27	62.68	58.96	61.70
3	82.63	76.78	71.95	73.01	66.41	61.71	57.83	58.68
4	83.07	78.18	72.18	72.74	70.56	66.41	61.31	61.78
5	135.90	83.97	76.78	73.44	117.02	72.31	66.11	63.24
Total	100.61	80.25	74.16	74.10	85.21	67.96	62.81	62.76

Overall, relative income of age group 65-74 is higher than relative income of age group >75. Relative income of both age groups decreases, when compared to "older" working age groups.

[2] Disposable (monetary) income by equivalent adult. To keep the text simple this will just be referred as income.

In general, households in age groups 65-74 and >75, in higher income quintiles, are relatively better off than households in lower income quintiles.

Table 2 shows ratios for selected OECD countries. Direct comparison is limited as these results, taken from Yamada (2002), refer to the mid 90's and the equivalence scale used is different.

Table 2. Disposable income of older age groups as percentage of disposable income of total population (international comparison)

	65-74	>75
Canada	98	94
Finland	85	78
Germany	93	78
Italy	86	82
Japan	89	87
Netherlands	90	79
Portugal	***83***	***70***
Sweden	95	78
United Kingdom	80	74
United States	98	82

Source: Yamada (2002) and DGEP.

Data for Portugal refers to 1999; data for other countries refers to mid 90's.

Next the analysis is restricted to "retired" households, which means that the household representative is retired and over 65 years old and that the household has no income from the labour market (dependent employment, self-employment and unemployment benefits[3]). "Retired" households account for about 74% of total households whose representative is over 65 years old. Additionally "retired" households were divided in three subgroups: single women, single men and couples. Single adult implies that the household representative is single, divorced, separated or widow. Couples imply that the household representative is married (with or without register). Single adult households are mostly individuals living alone. Couples are mostly two adults living together. The average income of "retired" households was compared to the average income of working age households. The results are presented in **table 3**.

[3] Albeit being income from the labour market, sickness subsidies were left out, since they come together with disability subsidies.

Table 3. Mean disposable income of "retired" households as percentage of mean disposable income of people aged 16-64

	Single adult				Couples	
	Women		Men			
	65-74	***>75***	***65-74***	***>75***	***65-74***	***>75***
1	74.16	67.08	67.96	75.55	72.81	73.10
2	58.97	54.05	54.20	62.39	64.66	56.64
3	54.03	50.43	51.02	58.14	61.87	52.10
4	54.57	44.46	54.60	78.95	68.86	54.66
5	71.56	44.20	53.12	94.30	71.97	61.42
Total	63.19	47.49	53.03	80.08	68.71	58.45

In age group 65-74 couples are relatively better off than single adults and single women are relatively better off than single men. In age group >75 couples are relatively better off than single women but are relatively worse off than single men. Overall, single women in age group 65-74 in higher income quintiles are relatively better off than single women in lower income quintiles while single women in age group >75 in higher income quintiles are relatively worse off than single women in lower income quintiles. Single men in age group 65-74 in higher income quintiles are relatively worse off than single men in lower income quintiles while single man in age group>75 in higher income quintiles are relatively better off than single men in lower income quintiles. Couples in higher income quintiles are better off than couples in lower income quintiles no matter what their age group is.

Results for international comparisons were once again taken from Yamada (2002). The limitations to comparison are the same as before: different equivalence scales were used and OECD countries (excluding Portugal) data refers to the mid 90's while data for Portugal refers to 1999.

Table 4. Ratio of disposable income of "retired" households to disposable income of working age households (international comparison)

	Single adult	Two or more adults
Canada	69	89
Finland	61	83
Germany	70	85
Italy	54	71
Japan	44	64
Netherlands	71	82
Portugal	***57***	***64***
Sweden	68	91
United Kingdom	58	70
United States	58	77

Source: Yamada (2002) and DGEP.

Data for Portugal refers to 1999; data for other countries refers to mid 90's.

Since geographical asymmetries in Portugal are significant, households over 65 years old were divided according to their geographical location: rural, semi-urban and urban.

Table 5. Mean disposable income of people aged 65 and over as percentage of mean disposable income of people aged 16-64, by geographical distribution

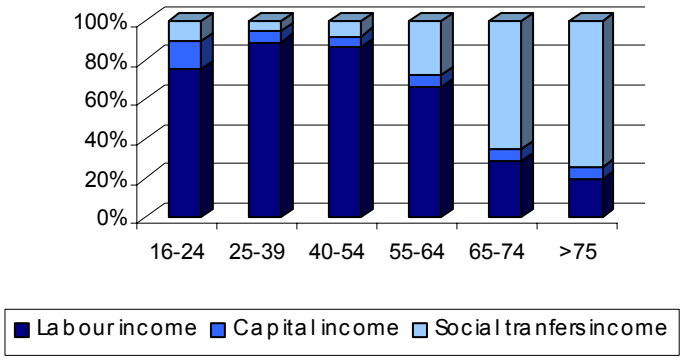
	Rural		Semi-urban		Urban	
	65-74	***>75***	***65-74***	***>75***	***65-74***	***>75***
1	70.34	64.07	77.06	68.51	94.46	85.94
2	60.79	50.45	67.66	56.69	87.30	74.76
3	57.47	45.48	67.07	54.76	86.58	73.61
4	58.56	41.81	66.65	59.49	91.05	78.28
5	50.39	35.96	60.37	50.79	97.86	86.00
Total	55.71	42.33	64.59	55.02	93.02	80.82

Households in rural areas are relatively worse off than households in urban areas. As **table 5** shows, households in rural and semi-urban areas, in higher income quintiles are relatively worse off than households in lower income quintiles, while households in urban areas, in higher income quintiles are relatively better off than households in lower income quintiles.

Finally, monetary income by sources was analysed. Three income components were identified: labour income, which corresponds to income from dependent employment and self-employment; capital income, which corresponds to interests, rents, periodical and non-periodical transfers from abroad and from other households, periodical and non-periodical insurance instalments and other non-government transfers; social transfers, which correspond to pensions, housing benefits, family benefits, unemployment benefits, sickness and disability benefits, education and training benefits, income for social insertion and other subsidies.

First, all households were divided by age groups. The results are presented in **chart 1**.

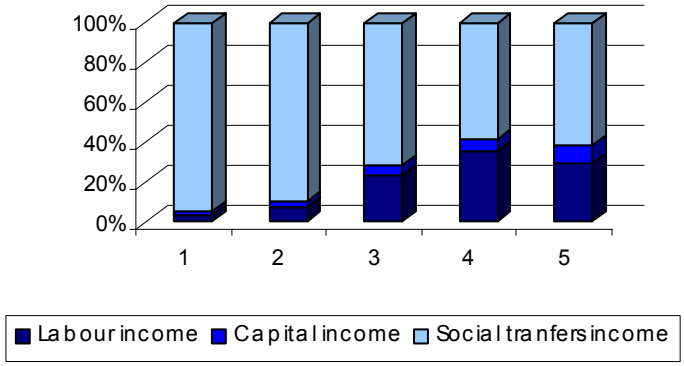
Chart 1. Disposable income by source of income and age category



Overall, "older" age groups have relatively more income from social transfers and relatively less income from labour than other age groups. Apart from age group 16-24, the proportion of capital income is almost the same in every age group.

Next, households over 65 years old were analysed by income quintiles. Once again income quintiles were calculated separately. Results are presented in **chart 2**.

Chart 2. Disposable income by source of income and income quintiles, age 65 and over



Overall, as income increases, social transfers share on total income declines, while labour income and capital income become relatively more important.

Consumption

Some studies on income distribution consider that consumption might be a better indicator of well-being than income, since it is through consumption that households gain utility- income

is potential utility while consumption is actual utility. Thus, in this section, the analysis, which previously considered income, now considers consumption expenditures. Again, equivalence scales are considered. Consumption expenditures include self-consumption, self-supply, self-renting, wages in goods and non-monetary transfers. Income quintiles are used.

Table 6. Mean consumption expenditures of people aged 65 and over, as percentage of mean consumption expenditures of people aged 16-64

	65-74				>75			
	16-24	***25-39***	***40-54***	***55-64***	***16-24***	***25-39***	***40-54***	***55-64***
1	46.13	72.24	69.48	75.93	39.54	61.91	59.54	65.07
2	52.88	67.23	63.60	72.50	40.21	51.13	48.37	55.14
3	59.14	64.61	65.81	68.15	46.05	50.31	51.24	53.07
4	78.43	65.53	71.69	74.09	65.54	54.76	59.91	61.92
5	112.07	78.17	72.87	81.25	96.66	67.43	62.85	70.08
Total	72.49	70.61	69.56	75.49	59.90	58.34	57.47	62.37

Comparison between the average consumption[4] of age groups 65-74 and >75 and the average consumption of the other four age groups shows that, overall, households in age group >75 consume relatively less than households in age group 65-74. Additionally, households in higher income quintiles consume relatively more, when compared to households in higher income quintiles in "younger" age groups, than households in lower income quintiles.

Comparison between **table 1** and **table 6** shows that the income ratio (average income of households in "older" age groups as percentage of average income of households in "younger " age groups) is higher than the consumption ratio (average consumption of households in "older" age groups as percentage of average consumption of households in "younger" age groups), that is, households in "older" age groups have relatively more income than consumption expenditures. This result might be explained by higher saving rates among the elderly. Indeed, until the 90's Portugal was a country with a relatively high saving rate and elderly people are more reluctant to change their habits. Another possible explanation is that older people benefit from reduced prices in some goods and services (namely transport and communications).

Table 7 shows the results from consumption analysis, considering household type.

[4] Consumption expenditures by equivalent adult. To keep the text simple, these will be referred as consumption.

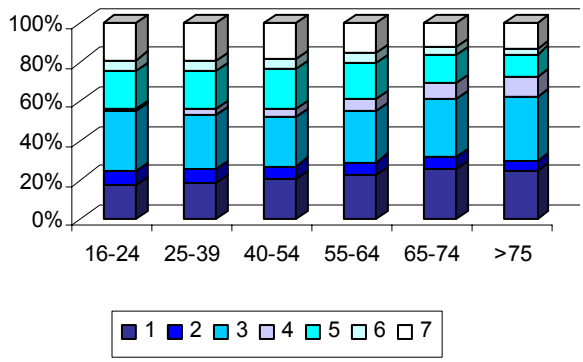
Table 7. Mean consumption expenditures of "retired" households as percentage of mean consumption expenditures of people aged 16-64

	Single adult				Couples	
	Women		Men			
	65-74	*>74*	*65-74*	*>74*	*65-74*	*>74*
1	75.02	56.46	56.17	60.97	66.32	65.16
2	50.45	44.39	64.95	58.65	63.09	49.41
3	54.95	45.99	54.94	56.67	65.10	47.40
4	57.44	39.00	59.20	49.83	64.95	51.27
5	70.43	45.69	60.71	87.06	82.65	57.47
Total	62.19	45.40	58.47	66.42	70.76	53.88

In age group 65-74, couples have a consumption ratio higher than single adults and single women have a consumption ratio higher than single men. However, in age group >75, couples have a consumption ratio higher than single women but lower than single men. This in line with the results presented in **table 3**. Comparison between **table 3** and **table 7** shows that, apart from single women, households in age group 65-74 have consumption ratios higher than the income ratios. For households in age group >75 consumption ratios are lower than income ratios.

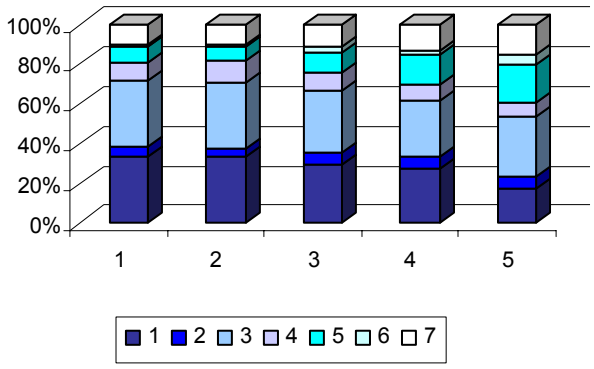
Next, consumption was divided, by goods and services. The consumption groups considered were: food and beverages (1), clothing and footwear (2), dwelling (3), health (4), transport and communications (5), recreation and culture (6) and others (7). Once again total households were divided per age groups (**chart 3**) and households in age group >65 were divided by income quintiles (**chart 4**).

Chart 3. Consumption expenditures by goods and services and age category



Households in "older" age groups spend relatively more on food and beverages, dwelling and health, that is, essential goods, than in "younger" age groups.

Chart 4. Consumption expenditures by goods and services and income quintiles, age 65 and over



Households, headed by an individual aged 65 and over, in lower income quintiles spend relatively more on food and beverages, dwelling and health than households in higher income quintiles.

A possible distortion relatively to consumption expenditures is the exclusion of housing acquisition expenditures, which in the Household Income Survey concern housing interests, mortgages and payments.

Table 8. Mean housing acquisition expenditures of "retired" households as percentage of mean housing acquisition expenditures of people aged 16-64

	Single Adult	Couple
1	1.19	30.27
2	0.00	0.14
3	0.17	10.63
4	2.84	3.30
5	9.57	0.97
Total	4.46	4.79

Expenditures on housing acquisition by "retired" households are significantly less than expenditures of households in working age groups. Single adults in "retired" households spend about 4.5% on housing acquisition relatively to households in the working age group while couples spend about 4.8%. This results not only from the fact that older people usually live in houses totally paid for but also from the fact that in Portugal, due to legislation, older rents are kept very low and thus the older generation had a lifelong incentive to stay in a rented house instead of buying one. Indeed, 32.4 per cent of households in age group >65 live in a rented house.

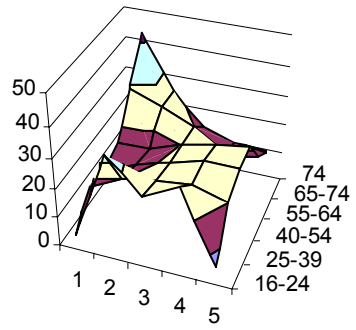
3.2. Inequality

Analysis of inequality will be two folded: first, inequality will be decomposed by sub-groups, in order to show the contribution of age category, geographical distribution and working status to total inequality. The last two issues will only be analysed for age group >65. The measures used in this decomposition will be the Theil indices, described ahead. Next, inequality will be decomposed by factor component, considering both income and consumption, in order to show which income source and consumption expenditure most contributes to inequality. This analysis is also restricted to age group >65. The inequality measure used is the Gini index, also described ahead.

Decomposition by sub-groups

Chart 5 shows the percentage of households, by age group, in each income quintile. Income quintiles were calculated for the entire population and then households in each age group were distributed by the income quintiles thus calculated.

Chart 5. Households in income quintiles as percentage of total households, by age category



Households in "older" age groups are more likely to be in lower income quintiles than households in "younger" age groups, which in turn are more likely to be in higher income quintiles. The chart also suggests that there might be more inequality in "older" age groups, since it is steeper for these age groups.

Chart 5 compares[5] to chart 3.1 in Yamada (2002). The results in **Chart 5** are in line with those presented in the mentioned study. However the chart for Portugal is steeper for "older"

[5] As said before all comparisons have to take into account that the period considered is slightly different and that equivalence scales used are not the same. This is also true for comparisons made ahead.

age groups, which means that households in "older" age groups are more likely to be in lower income quintiles in Portugal than in other selected OECD countries.

The main inequality measures considered in this subsection are:

- The Gini index

$$G(Y) = \frac{2}{n^2 \mu} \sum_i \left(i - \frac{n+1}{2} \right) Y_i \qquad \textbf{(3)}$$

$Y_1 \geq Y_2 \geq \ldots Y_n$

Y - The variable whose inequality is being analysed, usually income;

i - Individual

- Theil indices

$$G(0) = \frac{1}{n} \sum_i \log\left(\frac{\mu}{Y_i} \right) \qquad \textbf{(4)}$$

$$G(1) = \frac{1}{n} \sum_i \frac{Y_i}{\mu} \log\left(\frac{Y_i}{\mu} \right) \qquad \textbf{(5)}$$

- Atkinson indices

$$A(\varepsilon) = 1 - \left(\frac{1}{\mu} \right) \left[\frac{1}{n} \sum_i Y_i^{1-\varepsilon} \right]^{\frac{1}{1-\varepsilon}} \qquad \textbf{(6)}$$

ε - Inequality aversion parameter

Inequality increases with the values of the indices.

Table 9 presents a summary of inequality measures, considering all population distributed by age category. Population[6] distribution is given by:

[6] Equivalence scales are used to estimate inequality indices.

$$\frac{n_g}{n} \qquad (7)$$

Income share is given by:

$$\frac{\mu_g n_g}{\mu n} \qquad (8)$$

Table 9. Inequality measures, by age category

	Pop. Dist.	Income share	Gini	G(0)	G(1)	A(0.5)	A(1)	A(2)
16-24	0.01	0.01	0.21	0.07	0.07	0.04	0.07	0.13
25-39	0.16	0.16	0.35	0.20	0.22	0.10	0.18	0.32
40-54	0.34	0.38	0.35	0.21	0.22	0.10	0.19	0.34
55-64	0.21	0.23	0.38	0.24	0.25	0.12	0.21	0.38
65-74	0.17	0.14	0.36	0.22	0.24	0.11	0.19	0.33
>75	0.12	0.08	0.37	0.22	0.25	0.11	0.19	0.31
Total	1.00	1.00	0.37	0.23	0.24	0.11	0.20	0.35

Results in **table 9** show that inequality is highest in age group 55-64 followed by the two "older" age groups. Furthermore, age group>75 exhibits higher inequality indices values than age group 65-74. The 0.37 value for the Gini index, relative to total population, compares[7] to the 0.36 value presented in [3]. Furthermore, the value of the Gini index in Farinha (1996), using 1990 data, was 0.32 both for age group 65-74 and for age group >75.

Inequality of age group >65 was also analysed, considering geographical distribution, household type and working status. **Table 10** presents the results concerning geographical distribution.

Table 10. Inequality measures, by geographical distribution, age 65 and over

	Pop. Dist.	Income share	Gini	G(0)	G(1)	A(0.5)	A(1)	A(2)
Rural	0.24	0.17	0.30	0.14	0.16	0.07	0.13	0.23
Semi-urban	0.29	0.25	0.32	0.16	0.17	0.08	0.15	0.26
Urban	0.47	0.58	0.38	0.23	0.26	0.12	0.21	0.35
Total	1.00	1.00	0.37	0.22	0.25	0.11	0.20	0.33

All inequality indices show that inequality is more significant in urban areas.

Table 11 analyses the household type.

[7] Survey year is different.

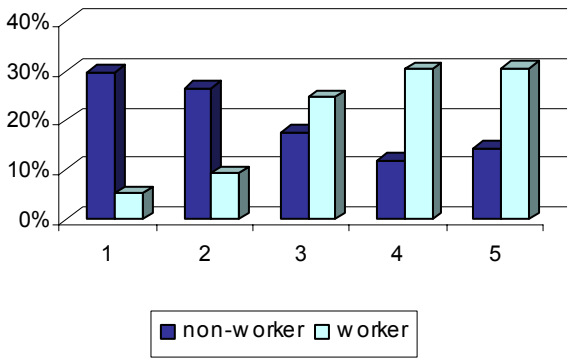
Table 11. Inequality measures, by household type, age 65 and over

	Pop. Dist.	Income share	Gini	G(0)	G(1)	A(0.5)	A(1)	A(2)
Single woman	0.30	0.26	0.36	0.21	0.23	0.10	0.19	0.31
Single man	0.07	0.07	0.38	0.23	0.24	0.11	0.20	0.34
Couple	0.63	0.67	0.37	0.22	0.25	0.11	0.20	0.33
Total	1.00	1.00	0.37	0.22	0.25	0.11	0.20	0.33

Most inequality indices show that inequality is more significant for single man (G(1) being the exception). All inequality indices show that inequality is less significant for single women.

In **chart 6**, age group >65 is distributed between working and non-working households. Non-working households are households that have no income from labour market (dependent employment, self-employment and unemployment subsidies, as described before). Income quintiles are calculated on the basis of the entire population age 65 and over.

Chart 6. Percentage of "working" and "non-working" households in each income quintile, age 65 and over



The proportion of working households in each income quintile increases with income while the proportion of non-working households in each income quintile decreases for higher income quintiles.

Table 12 presents the inequality measures concerning the working status.

Table 12. Inequality measures, by working status, age 65 and over

	Pop. Dist.	Income share	Gini	G(0)	G(1)	A(0.5)	A(1)	A(2)
Non-worker	0.63	0.54	0.37	0.22	0.26	0.11	0.20	0.32
Worker	0.37	0.46	0.32	0.17	0.19	0.09	0.02	0.26
Total	1.00	1.00	0.37	0.22	0.25	0.11	0.20	0.33

Inequality indices show that inequality is higher among non-working households.

Next, the Theil indices were decomposed per age group in order to analyse the contribution of age to total inequality. This decomposition is given by:

$$G(0) = \sum_g \frac{n_g}{n} G(0)_g + \sum_g \frac{n_g}{n} \log\left(\frac{\mu}{\mu_g}\right) \qquad \textbf{(9)}$$

$$G(1) = \sum_g \frac{\mu_g n_g}{n_g n} G(1)_g + \sum_g \frac{\mu_g n_g}{\mu n} \log\left(\frac{\mu_g}{\mu}\right) \qquad \textbf{(10)}$$

The first part of both equations represents the within-group component of inequality, while the second part represents the between-group component. Inequality decomposition, as described, is presented in **table 13**.

The Theil indices were also decomposed by geographical distribution, household type and working status, considering just age group >65, in order to analyse the contribution of these elements to total inequality. The results are also presented in **table 13**.

Table 13. Decomposition of inequality

	Within-group		**Between-group**	
	G(0)	***G(1)***	***G(0)***	***G(1)***
All age groups				
Age category	94.27	94.95	5.73	5.05
Age group>65				
Geographical distribution	87.32	89.01	12.68	10.99
Household Type	98.42	98.63	1.58	1.37
Working Status	92.43	92.28	7.57	7.72

Results in **table 13** show that the between-group component of inequality is significantly less important than the within-group component, that is, differences between groups contribute little to total inequality. Age category decomposition shows that age differences are responsible for little more than 5% of total inequality. In Farinha (1996), which used 1990 data, the proportion of inequality due to age differences was 3.3% (G(0)) and 3.0% (G(1)). The analysis of specific issues for age group >65 shows that differences in geographical distribution, followed by differences in working status contribute more to total inequality than differences in household type.

Decomposition by factors

In this analysis the Gini index will be decomposed by factor components, considering both income and consumption.

Shorrocks (1982) proved that there is only one decomposition rule and that this rule can be applied to any inequality index. This rule is as follows:

$$s_k = \frac{S_k}{I} = \frac{\text{cov}(Y_k, Y)}{\text{var}(Y)} \qquad \textbf{(11)}$$

s_k relative contribution of factor k;

S_k absolute contribution of factor k;

Y_k total income from source k;

Y total income, $Y = \sum_k Y_k$;

I inequality index.

Income and consumption of age group >65 were distributed by source and by goods and services, respectively. The income sources and the expenditures by goods and services are the same as before. **Table 14** presents the results concerning the decomposition of income inequality.

Table 14. Decomposition of income inequality by income component, population aged 65 and over

	Gini index	Absolute contribution	Relative contribution	Weight on total income
Total	0.37	0.37	100.00	100.00
Labour income	0.79	0.14	37.72	25.30
Capital income	0.91	0.04	10.17	6.38
Social transfers income	0.40	0.19	52.11	68.32

Social transfers represent over two thirds of age group >65 total income; however their contribution to inequality is just 52% and therefore transfers reduce income inequality. The other two income sources represent relatively less on total income than on total inequality.

Table 15 presents results for the same analysis, but considering decomposition of consumption inequality.

Table 15. Decomposition of consumption inequality by consumption expenditures component, population aged 65 and over

	Gini index	Absolute contribution	Relative contribution	Weight on total expenditures
Total	0.38	0.38	1.00	1.00
Food and beverages	0.34	0.03	0.08	0.26
Clothing and footwear	0.69	0.02	0.05	0.05
Dwelling	0.50	0.12	0.35	0.31
Health	0.66	0.02	0.06	0.09
Transport and communications	0.72	0.10	0.29	0.13
Recreation and culture	0.77	0.02	0.05	0.03
Others	0.64	0.05	0.13	0.13

Dwelling expenditures, followed by expenditures on food and beverages and on transport and communications are those that weight more on total expenditures. Dwelling expenditures are also the main contributor to total inequality of age group >65. Spending on clothing and footwear, dwelling, transport and communications and recreation and culture contribute relatively more to total inequality than to total expenditures.

3.3. Poverty

In this third sub-section poverty among the elderly is analysed. Poverty analysis poses two questions: the definition of a poverty cut-off threshold and poverty measures to be used.

The main problem in establishing a poverty line is that most households tend to cluster around the poverty line and small changes in this line can lead to significant changes in results. It is of general agreement that the poverty line should be a percentage of median income. In this analysis the poverty lines considered are 40%, 50% and 60% of median income.

The poverty measures used are the Foster-Greer-Thorbecke (FGT) measures, given by:

$$P(\alpha) = \sum_{i}^{q} \frac{\left(1 - \frac{Y_i}{Z}\right)^{\alpha}}{n} \qquad \textbf{(12)}$$

Z - Poverty cut-off threshold

q - Poor households

α - Poverty aversion parameter

Depending on the value of α, the following indices can be estimated:

- α=0- headcount ratio, which is to say, the percentage of poor individuals in total population;
- α=1- poverty gap, which corresponds to the difference between income and the poverty line, as percentage of poverty line, for poor individuals, divided by total population;
- α=2- squared poverty gap.

Poverty increases with the values of the indices.

The percentage contribution of sub-group g to total poverty is given by the expression:

$$\frac{n_g}{n}\frac{P(\alpha)_g}{P(\alpha)} \qquad \textbf{(13)}$$

Before presenting the poverty measures, income distribution of the poorest will be analysed. In **chart 7** the average income of the lowest income quintile of working age group (<65) and retirement age group (>65) is compared to the average income of working age group.

Chart 7. Mean disposable income of the lowest income quintile as percentage of mean disposable income of people aged 16 to 64

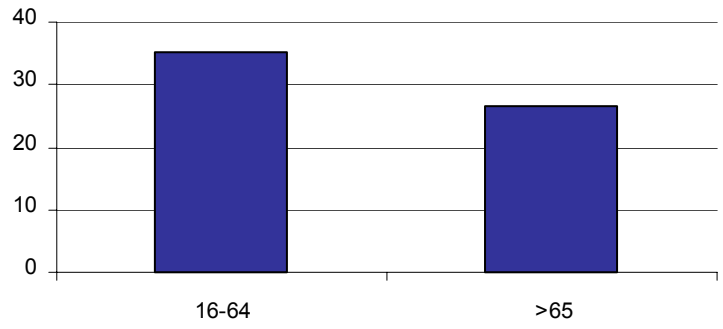
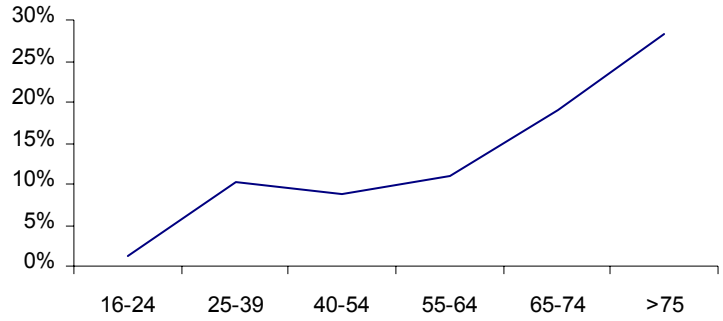


Chart 7 shows that households in the lowest income quintile of age group >65 have relatively less income than households in the lowest income quintile of the working age group.

Chart 7 can be compared to chart 2.2 in Yamada (2002). This shows that in Finland, Germany, Japan, United Kingdom and United States "older" households are also worse off than "younger" households. However, only Japan has a ratio as low as Portugal for "older" households.

Additionally, **chart 8** shows the percentage of households below the 50% cut-off line[8].

Chart 8. Percentage of population below the income cut-off threshold



The two "older" age groups have relatively more households under the 50% cut-off threshold than the remaining four age groups. Thus, apparently age is a determinant of poverty and poverty is more significant among the elderly.

Chart 8 compares to chart 2.5 in Yamada (2002). Unlike Portugal, other selected OECD countries either exhibit lines with negative inclination or u-shaped. In age group 65-74 Italy, Japan and United States have about the same proportion of households below the poverty line as Portugal; in age group >75 only Japan and the United States have about the same proportion of households below the poverty line.

Table 16 presents poverty measures considering two main age groups: working age and >65.

Table 16. Poverty measures

	40%		50%		60%	
	16-54	*>65*	*16-54*	*>65*	*16-54*	*>65*
Headcount ratio	0.050	0.123	0.097	0.227	0.148	0.354
Share	49.7	50.3	51.1	48.9	50.7	49.3
Poverty gap	0.012	0.022	0.024	0.053	0.040	0.092
Share	57.6	42.4	52.8	47.1	51.9	48.1
Squared poverty gap	0.005	0.007	0.010	0.018	0.017	0.034
Share	65.1	34.9	57.5	42.5	54.3	45.7
Average income of poor (as % of Z)	75.1	81.9	75.2	76.8	94.4	73.9
Proportion of total population	71.1	28.9	71.1	28.9	71.1	28.9

[8] Percentage of total households below the cut-off threshold is 15.42

The 40% poverty line is 485 092 PTE (2419.63 euros), the 50% line is 606 366 PTE (3024.54 euros) and the 60% line is 727638 PTE (3629.44 euros). For all cut-off lines, there are relatively more poor households[9] in age group >65 than in the working age group. When the poverty line considered is 60% of median income, poor households in age group >65 are above one third of total households in this age group. Only when the first cut-off line is considered does the contribution to poverty come mainly from age group >65. As poverty aversion (α) increases, that is, as income of poor households counts relatively more, the contribution to poverty of age group >65 decreases. The headcount ratio for households in age group >65, considering the 60% poverty threshold, presented in [3], is 39.1%, which compares[10] to 35.4% in this study.

Next, only age group >65 was considered, in order to analyse the main contributors to poverty in this age group. Thus, three main issues were analysed: family type, geographical distribution and working status.

Table 17 presents results, considering family type (single or couple).

Table 17. Poverty measures, by family type, age 65 and over

	40%			**50%**			**60%**		
	Single Woman	***Single Man***	***Couple***	***Single Woman***	***Single Man***	***Couple***	***Single Woman***	***Single Man***	***Couple***
Headcount ratio	0,179	0,133	0,096	0,277	0,243	0,202	0,413	0,354	0,326
Share	21,8	3,8	24,7	17,7	3,7	27,5	17,1	3,5	28,7
Poverty gap	0,032	0,022	0,018	0,072	0,054	0,043	0,117	0,096	0,080
Share	18,3	2,9	21,2	19,1	3,4	24,6	18,2	3,5	26,4
Squared poverty gap	0,010	0,006	0,005	0,025	0,017	0,014	0,046	0,035	0,029
Share	15,0	2,1	17,7	18,0	2,9	21,6	18,3	3,3	24,1
Average income of poor (as % of Z)	82,0	83,5	81,5	74,1	77,7	78,5	71,5	72,9	75,4
Proportion of total population	8,6	2,0	18,3	8,6	2,0	18,3	8,6	2,0	18,3

The three poverty indices show that, no matter what poverty line is considered, poverty is more significant for single individuals than for couples. Furthermore, poverty is more significant among single women than among single men. Overall couples contribute more to poverty but if weight on poverty is compared with weight on total population, then single women contribute relatively more to poverty.

Table 18 presents results, considering geographical distribution.

[9] Equivalence scales are considered in the estimation of poverty measures.
[10] Survey year is different.

Table 18. Poverty measures, by geographical distribution, age 65 and over

	40%			50%			60%		
	Rural	*Semi-urban*	*Urban*	*Rural*	*Semi-urban*	*Urban*	*Rural*	*Semi-urban*	*Urban*
Headcount ratio	0.194	0.145	0.073	0.371	0.271	0.124	0.541	0.413	0.219
Share	19.2	17.3	13.8	19.4	17.0	12.5	18.3	16.8	14.2
Poverty gap	0.037	0.025	0.013	0.086	0.061	0.030	0.148	0.108	0.054
Share	17.0	14.1	11.3	18.6	16.1	12.5	18.7	16.5	13.0
Squared poverty gap	0.012	0.007	0.004	0.029	0.020	0.010	0.056	0.040	0.020
Share	14.7	10.9	9.3	17.1	14.1	11.4	18.1	15.5	12.2
Average income of poor (as % of Z)	81.0	82.5	82.4	76.9	77.4	76.0	72.7	73.8	75.6
Proportion of total population	7.0	8.4	13.4	7.0	8.4	13.4	7.0	8.4	13.4

Poverty measures show that poverty is more significant in rural areas and less significant in urban areas. For the 60% poverty line, over 50% of households in rural areas are considered poor. Furthermore, households in rural areas contribute relatively more to poverty.

Finally, in **table 19** results concerning working status are presented.

Table 19. Poverty measures, by working status, age 65 and over

	40%		50%		60%	
	Worker	*Non-worker*	*Worker*	*Non-worker*	*Worker*	*Non-worker*
Headcount ratio	0.023	0.181	0.052	0.328	0.118	0.490
Share	3.5	46.8	4.1	44.7	6.0	43.3
Poverty gap	0.004	0.033	0.011	0.077	0.024	0.132
Share	3.1	39.3	3.6	43.5	4.6	43.6
Squared poverty gap	0.001	0.010	0.003	0.026	0.008	0.050
Share	2.1	32.8	3.0	39.5	3.7	42.0
Average income of poor (as % of Z)	81.0	82.0	78.8	76.7	79.8	73.1
Proportion of total population	10.6	18.3	10.6	18.3	10.6	18.3

Poverty indices indicate that poverty is more significant among non-working households and that they contribute expressively more to poverty.

4. The adequacy of social assistance policies

In this section the adequacy of social assistance policies for households headed by a person aged 65 and over is analysed. Social assistance policies particularly aim individuals below a certain level of income and, in this way, differ from other transfer policies. An argument in favour of selective benefits is that instead of spreading scarce resources, the government should concentrate them on the poorest; an argument against is that social assistance benefits cause adverse work incentives, since the marginal wage, above which individuals are willing to work,

increases. On what concerns age group >65, this second argument only partially applies: if it is true that people might retire early if wages are low relatively to social assistance benefits, it is also true that people are expected to retire, eventually.

In Portugal, social assistance benefits specifically aimed at the elderly are social pensions[11] and pension complements for individuals, in the pension general regime[12], with very low pensions. The Household Budget Survey database only contains information on total pension income, thus making it impossible to analyse pension complements. Information on these will be presented (**tables 24** and **25**), but it is taken from the National Centre for Pensions database.

Information on social pensions, taken from the Household Budget Survey, considers the following: in 1999 the monthly value of the social pension was 23600 PTE (117.72 euros), which corresponds to an annual value[13] of 330400 PTE (1648.03 euros). Since the social pension is the lowest pension attributed, households comprising single people receiving pension income equal or below 330400 PTE or households comprising a couple receiving pension income equal or below 660800 are likely[14] to be receiving a social pension.

Social pension income, thus calculated, is added to guaranteed minimum income, periodical family benefits, housing benefits, education and training benefits and other subsidies in order to add up total social assistance benefits. Although most of these benefits aim population under 65, they might affect households headed by a person aged 65 years old and over if these households comprise younger people. Hence, the following analyses will be on total social assistance benefits (except for pension complements) affecting households headed by a person aged 65 and over.

Poverty analysis previously made, considering disposable income, is now made considering disposable income before social assistance benefits, in order to determine how much poverty measures would worsen if there were no social assistance policies, or, putting it the other way around, in order to determine the contribution of social assistance policies to poverty reduction. **Table 20** presents results for age group >65.

[11] Social pensions are paid to individuals that haven't contributed to a pension scheme.
[12] Individuals that have contributed to a pension scheme.
[13] 14 payments per year are made.
[14] There can be households that, for one reason or another, didn't receive pension income all year long.

Table 20. Poverty measures, age 65 and over

	40%	50%	60%
Headcount ratio	0.147	0.255	0.381
Poverty gap	0.062	0.089	0.127
Squared poverty gap	0.048	0.058	0.073
Average income of poor (as % of Z)	57.9	65.1	66.7

Overall, poverty measures increase when disposable income before social assistance transfers is considered. However, this increase is relatively more significant for the 40% poverty threshold and relatively less significant for the 60% poverty threshold.

Table 21 presents results, considering family type.

Table 21. Poverty measures, by family type, age 65 and over

	40%			50%			60%		
	Single Woman	*Single Man*	*Couple*	*Single Woman*	*Single Man*	*Couple*	*Single Woman*	*Single Man*	*Couple*
Headcount ratio	0.185	0.133	0.131	0.297	0.243	0.236	0.429	0.356	0.362
Poverty gap	0.052	0.029	0.070	0.090	0.060	0.092	0.135	0.101	0.126
Squared poverty gap	0.033	0.016	0.059	0.047	0.026	0.067	0.067	0.043	0.079
Average income of poor (as % of Z)	72.0	77.8	46.4	69.7	75.3	61.1	68.5	71.6	65.1

Comparing results on **table 21** to results on **table 17** shows that couples benefit relatively more[15] from social assistance policies, in such a way that before the transfers couples present, in some cases, the highest poverty measures and after the transfers present the lowest poverty measures. Furthermore, single women benefit relatively more from social assistance policies than single men, which is consistent with the fact that poverty measures for single women before social transfers are higher than poverty measures for single men.

Table 22 presents results considering geographical distribution and compares to **table 18**.

Table 22. Poverty measures, by geographical distribution, age 65 and over

	40%			50%			60%		
	Rural	*Semi-urban*	*Urban*	*Rural*	*Semi-urban*	*Urban*	*Rural*	*Semi-urban*	*Urban*
Headcount ratio	0.219	0.181	0.088	0.411	0.302	0.143	0.570	0.440	0.246
Poverty gap	0.090	0.071	0.041	0.135	0.104	0.056	0.195	0.148	0.079
Squared poverty gap	0.070	0.052	0.035	0.085	0.065	0.040	0.109	0.083	0.048
Average income of poor (as % of Z)	58.7	60.9	53.1	67.1	65.7	61.1	65.9	66.4	67.9

[15] Measured by the relative change of poverty measures.

Results show that, except for the 40% poverty threshold, urban households benefit relatively more from social assistance policies, even though rural households have the highest poverty measures. Considering average income as percentage of poverty threshold, urban households always show the biggest relative rise in average income.

Table 23 presents results concerning working status and compares to **table 19**.

Table 23. Poverty measures, by working status, age 65 and over

	40%		50%		60%	
	Worker	*Non-worker*	*Worker*	*Non-worker*	*Worker*	*Non-worker*
Headcount ratio	0.064	0.195	0.113	0.337	0.183	0.497
Poverty gap	0.022	0.085	0.035	0.120	0.053	0.170
Squared poverty gap	0.012	0.069	0.018	0.081	0.026	0.100
Average income of poor (as % of Z)	65.1	56.6	69.2	64.3	70.9	65.8

Comparison between results in **table 23** and **table 19** shows that working households benefit relatively more from social assistance policies even though non-working households present the highest poverty measures. However, for the first two poverty thresholds average income as percentage of poverty threshold increases relatively more for non-working households.

Tables 24 and **25** show results concerning pension complements. The National Centre for Pensions database was used in this analysis. This database only includes pension income, disaggregated by components, for each beneficiary. Hence, pension income quintiles were used. **Table 24** shows distribution of social complements.

Table 24. Distribution of Social Complements, by pension income quintiles

	1	2	3	4	5	Total
<65	6.3	5.4	3.9	0.0	0.0	15.7
65-74	44.4	6.0	18.5	5.3	0.1	74.3
>75	9.3	0.5	0.2	0.0	0.0	10
Total	60.1	11.9	22.7	5.3	0.1	100

According to results on **table 24**, about 60% of pension complements are given to people in the first pension income quintile and 53.7% are given to people in age group >65 in the first pension income quintile. However, people in the second pension income quintile receive relatively less pension complements than people in the third pension income quintile.

Table 25 shows pension complements as percentage of total pension income.

Table 25. Social complement as percentage of pension income, by pension income quintiles

	1	2	3	4	5
<65	23.8	24.6	10.9	0.1	0.0
65-74	24.5	15.5	14.7	3.1	0.0
>75	14.7	0	1.4	0.4	0.0

Overall, pension complements weight relatively more on total pension income in lower income quintiles than in higher pension income quintiles. Pension complements are relatively more important for people in age group 65-74 (except for the second pension income quintile) and relatively less important for people in age group >75.

5. Concluding remarks

This study addresses income distribution, inequality and poverty among the elderly (>65). The main results arising from this study are:

Income and consumption expenditures distribution

- Households in the retirement age group have relatively less income than households in the working age group. Households in age group >75 are relatively worse off than households in age group 65-74. When only "retired" households in age group >65 are considered, the results are also worse than when all households in age group >65 are considered. Finally, households in rural areas are relatively worse off than households in urban areas;
- Households in age group >65 consume relatively less than households in the working age group and, within age group >65, households in age group >75 are relatively worse off than households in age group 65-74. When analysis is restricted to "retired" households in age group >65, the consumption ratio is smaller than when all households in age group >65 are considered. Consumption ratios are smaller than income ratios (except for single men >75);
- The main income source for households in age group >65 is social transfers. However they are less important for households in higher income quintiles than for households in lower income quintiles;
- The main consumption expenditures by goods and services for households in age group >65 are food and beverages, dwelling and health. Lower income quintiles households spend relatively more in these three items than higher income quintiles households.

Inequality

- Inequality is higher among households in age group >65 than among households in the working age group. Furthermore, inequality is higher among households in age group >75 than among households in age group 65-74;
- Considering only households in age group >65, inequality is higher in rural areas, among single men and among non-working households;
- Between-group differences have little importance on total inequality. Hence, differences in age account for little more than 5% of total inequality. For households in age group >65, geographical differences are relatively more important for total inequality than family type differences or working status differences;
- Decomposition of income by factor component shows that labour income and capital income weight more on total inequality than on total income and that expenditures on clothing and footwear, dwelling, transport and communications and recreation and culture weight relatively more on total inequality than on total expenditures;

Poverty

- There are relatively more poor households in age group >65 than in the working age group. The main contribution to total poverty comes mainly from households in the working age group (except for the 40% poverty line) but, comparing the weight on poverty to weight on total population then households in age group >65 contribute relatively more to poverty;
- Considering only age group >65, there are relatively more poor households with single people than poor households comprising couples. Nevertheless, couples contribute relatively more to total poverty. Additionally, there are relatively more poor households in rural areas than in urban areas and households in rural areas contribute relatively more to total poverty. Finally non-working households contribute significantly more to total poverty than working households and there are relatively more poor non-working households than working households.

Social assistance policies

- Social assistance policies contribute to reduce poverty and this reduction is more significant for lower poverty thresholds;
- Couples benefit relatively more from social transfers than single households, which is consistent with the fact that these households initially have higher poverty measures.

Likewise, single women benefit relatively more from social transfers than single men and have higher poverty measures initially;

- When households are distributed by geographical location and working status, social assistance policies seem to be misdirected. Hence, households in rural areas show higher poverty measures but households in urban areas benefit relatively more from transfers. Likewise non-working households have higher poverty measures but working households benefit relatively more from transfers.

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