

THE SOCIOECONOMIC DETERMINANTS OF ECONOMIC INEQUALITY Evidence from Portugal

LOS DETERMINANTES SOCIOECONÓMICOS DE LA DESIGUALDAD ECONÓMICA Datos de Portugal

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ABSTRACT

This article uses data from the 1994-2001 waves of the European Community Household Panel to investigate the socioeconomic determinants of economic inequality. The paper focuses on Portugal, a country with the largest inequality levels among EU countries, to report relevant facts on the distributions of income, labour earnings, and capital income. The paper shows how these distributions are related to family characteristics such as age, education, marital status and employment status. A Generalized Ordered Probit model is used to investigate how and to what extent the households' socioeconomic attributes determine their economic status and their mobility along the distributions. The article concludes that education is by and large the dimension more closely related to inequality.

KEYWORDS

Capital Income Distribution, Generalized Ordered Probit Model, Inequality, Income Distribution, Labour Earnings Distribution.

RESUMEN

Este artículo utiliza el Panel de Hogares de la Unión Europea (1994-2001) para investigar cuáles son los determinantes socioeconómicos de la desigualdad. El artículo se centra en Portugal, el país de la Unión Europea con mayores niveles de desigualdad, para documentar hechos relevantes sobre las distribuciones de la renta, salarios y rentas de capital. Se muestra cómo estas distribuciones están relacionadas con características familiares tales como edad, educación, estado civil y estado laboral. Por último, se emplea un modelo Probit Ordenado Generalizado para investigar cómo y en qué medida las diferentes características socioeconómicas de las familias determinan su estatus económico y su movilidad a lo largo de las distribuciones. El artículo concluye que la educación es, con diferencia, la dimensión socioeconómica más determinante en relación con la desigualdad.

PALABRAS CLAVE

Desigualdad, Distribución de la renta, Distribución salarial, Distribución de las rentas de capital, Modelo Probit Ordenado Generalizado.

INTRODUCTION

Economic inequality is a major concern for governments. Citizens are aware of the distributional aspects of relevant economic variables and use this information to evaluate how the economy fares in terms of equality when confronted with other economies and with previous periods. According to several studies, mass policy preferences on inequality importantly influence the policy output of welfare states in developed democracies (Brooks and Manza, 2006a, 2006b). Moreover, inequality indicators are an important tool for policy makers, researchers and institutions in the task of evaluating the inequality-reducing scope attributed to certain policies and improving the design of inequality programs.

This paper provides an anatomy of the extent and dimensions of economic inequality. The paper focuses on Portugal, the country with highest inequality levels among EU members, and on three relevant economic variables: income, labour earnings and, a proxy of wealth, capital income. Given the multidimensional nature of inequality, the paper reports, in a first stage, inequality facts along a variety of dimensions, including age, employment status, education, marital status and economic mobility. These dimensions were found to be closely related to economic inequality in previous research for the US and Spain (Budría, Díaz-Giménez, Ríos-Rull and Quadrini, 2002, Budría and Díaz-Giménez, 2007). In a second stage, the paper uses multivariate regression analysis to examine what is the relative contribution of the different household attributes (age, employment, education, and marital status) to economic inequality. A feature of the analysis is that we investigate how the effect of a given household attribute on economic status differs across segments of the distributions.

The data are taken from the European Community Household Panel dataset (ECHP, henceforth). This dataset presents two appealing features. The first one is comparability. The ECHP is a standardized survey that was carried out in the European Union on a yearly basis from 1994 to 2001. It is based on a common questionnaire and the harmonisation of concepts across countries, including definitions of relevant variables and the validation, imputation and weighting of the data. These characteristics allow for straightforward comparisons between the surveyed countries, reducing the number of conceptual and measurement problems that typically arise when conducting cross-country comparisons with household income data¹. As a second advantage, the ECHP allows for the possibility of continuously monitoring the same group of families and individuals over the years. This feature allows us to examine the dynamics of economic mobility in Portugal.

The paper contributes to the literature along three dimensions. First, the study of the distributions of relevant economic variables is a key ingredient for models desig-

¹ See Gottschalk and Smeeding (2000) for a discussion of these problems.

ned to evaluate the inequality and welfare implications of public policies. The accuracy and reliability of such models crucially depend on their capacity to reproduce stylized facts of the economy, such as the distribution of income and earnings, the households' income structure, and the socioeconomic characteristics of specific income groups. This paper attempts to highlight some of these facts in a coherent and summarized fashion. Moreover, this is done for Portugal, a country for which an exhaustive set of inequality indicators is mostly lacking.

Second, in the last few years, economists have begun to develop theories that quantitatively account for the observed distributions of earnings, income and wealth. Up to date, however, the resemblance between the models' and the data's distributions is not satisfactory (Castañeda *et al.*, 2002). The statistical analysis presented in the paper provides important hints about what factors and to what extent should be at the core of any successful theory of inequality. As will become apparent, heterogeneous human capital stands out as a key modelling strategy.

Third, we take advantage of the ECHP to explore how Portugal fares in terms of inequality relative to other European countries. For completeness sake we also report some inequality data for the US economy which we have constructed from the US Survey of Consumer Finances. Most of the data suggest that economic inequality in Portugal is high by international standards. Due to space reasons, these comparisons are confined to an appendix.

The rest of the paper is organized as follows. Section 1 reviews the literature on economic inequality in Portugal. Section 2 briefly describes the dataset and the longitudinal structure of the data. Section 3 reports basic facts regarding the range, shape, concentration and skewness of the income, earnings and capital income distributions. Section 4 examines the socioeconomic characteristics of households located in different segments of these three distributions. In Sections 5, 6, 7 and 8 households are partitioned by, respectively, age, employment status, education and marital status groups, and then relevant statistics for the resulting categories are reported. Section 9 computes income mobility matrices for different population groups. Section 10 switches from the statistical analysis to multivariate regression analysis to explicitly test how and to what extent the different household characteristics contribute to income inequality and income mobility. The paper includes three Appendices. Appendix A contains the definition of the income, labour earnings and capital income variables used in the paper. Appendix B reports the income, earnings and capital income distributions when these variables are equalized to account for heterogeneous household size. Finally, Appendix C reports inequality facts for France, Germany, Italy, Spain, Sweden, UK, Germany and the US, and compares them to those of Portugal.

PREVIOUS RESEARCH ON PORTUGUESE INEQUALITY

The study of economic inequality has a long tradition among economists². Still, the available evidence for Portugal is scarce, probably due to data limitations. One of the first attempts to describe the extent of inequality in Portugal is due to Gouveia and Tavares (1995). These authors use data from the Survey of Family Budgets to describe the Portuguese income distribution. They also examine changes over the 1980-1990 period and find that over these years income inequality tended to decrease. In a work related to the present paper, Rodrigues (1999) uses data from the 1994 ECHP and the Household Budget Survey 1994/1995 to explore the connection between household income and several socioeconomic factors, such as the household's composition, region and the employment status of the household head. In a policy-oriented paper, Gouveia and Rodrigues (2002) evaluate the impact of the Portuguese Guaranteed Minimum Income Programme on the income distribution in Portugal. According to their results, this program reduces the Gini index by 0.5%.

Cardoso (1998), in turn, focuses in earnings inequality rather than income inequality. She reports that during the eighties and the first half of the nineties wage dispersion increased sharply in Portugal. The results in Machado and Mata (2001) and Hartog *et al.* (2001) suggest that a substantial part of this increase was motivated by higher dispersion in the returns to education. Martins and Pereira (2004) find that in Portugal wage levels and wage dispersion are highly increasing in education levels. This results in an earnings distribution that is more unequally distributed than in most European countries. Consistent with this view, Carneiro (2008) reports that most part of the earnings variation in the Portuguese labour market is due to educational disparities. Vieira *et al.* (2005) focus on wage differentials between Portuguese regions and find that differences in educational attainment as well as in the returns to schooling are an important determinant of the large inter-regional inequalities found in the data. Finally, Cardoso (2006) compares the degree of wage mobility in Portugal and the UK and finds that, despite different labour market settings, the patterns of mobility are very similar in the two countries.

An important lesson from the literature is that, up to date, studies on the wealth distribution are mostly lacking in Portugal. This is due to the lack of statistical data on financial and, particularly, non-financial wealth. Cardoso and Cunha (2005) attempt to estimate the amount of wealth owned by Portuguese households using temporal series of capital formation from 1980-2004. Even though the paper does not deal with distributional aspects, it contains rich information about the different sources of household wealth in Portugal.

² For a broad coverage of the subject, including inequality measures, cross-country evidence and international trends, see Silber (1999) and Atkinson and Bourguignon (2000). Kaplow (2005) contains an interesting discussion on the convenience of measuring inequality.

THE DATASET

The European Community Household Panel (ECHP) is a standardized survey that is carried out in the European Union. Its period is yearly and its purpose is to obtain “comparable information across the member states on income, work and employment, poverty and social exclusion, housing, health, and many other diverse social indicators concerning the living conditions of households and persons” (Eurostat, 1996).

The ECHP defines a household as a group of people that share the same dwelling and have common living arrangements. The ECHP questionnaire is sent to a “reference person” in each household. This person is usually the household head but it could be another member of the household. To avoid this imprecision, we follow a more pragmatic view and assume that the household head is the person with the highest total income among family members. If two household members share this condition, or no member of the household has income, then we use the reference person indicated by the ECHP. The first year in which the Portuguese data was collected was 1994. The original Portuguese sample was made up of 4,881 households. The survey then follows the sample people, and it includes the children born to the initial sample women and the new households formed by members of the original ones. In this and in other aspects the ECHP resembles the University of Michigan’s Panel Study of Income Dynamics (PSID). In 2001, the last wave of the ECHP, the Portuguese sample contained 4,614 households.

In panel data analysis the reduction of observations between waves raises the typical problem of the loss of representativity of the sample. Peracchi (2002) analyzes attrition rates in the first three waves of the ECHP as well as in other popular household surveys, including the German Socio-Economic Panel (GSOEP), the Luxembourg’s Socio-Economic Panel (PSELL), the British Household Panel Survey (BHPS), and the Panel Study of Income Dynamics (PSID). He reports estimates that range between 9% and 38%. Luckily to us, the overall attrition rate in the Portuguese ECHP (i.e., the percentage decrease in the number of observations between waves 1994 and 2001) is as low as 5.8%, suggesting that the loss of representativity of the Portuguese sample due to attrition has been small. This feature will be particularly valuable in Sections 9 and 10, where we exploit the longitudinal structure of the survey.

INCOME, EARNINGS, AND CAPITAL INCOME INEQUALITY

The dimensions of inequality that are most frequently studied in the literature are income, wages and wealth. Portugal, however, lacks an adequate data source reporting information on households’ wealth. Given this limitation, this paper reports facts on income, labour earnings and, a proxy of wealth, capital income. These variables are measured on a yearly basis and constructed as described in Appendix A. The analysis that follows uses the 2001 wave of the ECHP to describe the main inequality facts regarding these distributions.

Ranges and shapes of the distributions

figure 1 illustrates the main differences in the range and shape of the distributions. Panel 4 contains the distribution of earnings when the households headed by a retiree are excluded from the sample. In these figures, the levels have been normalized by the mean, and the last intervals of the distributions represent the frequencies of households with more than 10 times the corresponding averages.

There are substantial differences in the ranges of the distributions. Income ranges from zero to 12.3 times average income, earnings range from zero to 8.5 times average earnings, and capital income ranges from zero to a startling 506.5 times average capital income. The sample averages of income, earnings and capital income are, respectively, 15,512 euros, 11,782 euros and 345 euros. The extremely large normalized range of the capital income distribution is due to the fact that 85.6% of the households report zero capital income and that maximum capital income is fairly large (174,463 euros). The top-coding used to draw these figures hides the large dispersion of capital income: while 94% of the sample households report less than average capital income (345 euros), 2.4% of the households report more than ten times that value. As regards the shape of the distributions, income, earnings and, particularly, capital income are significantly skewed to the right, with very short and fat lower tails and very thin and long upper tails.

Concentration

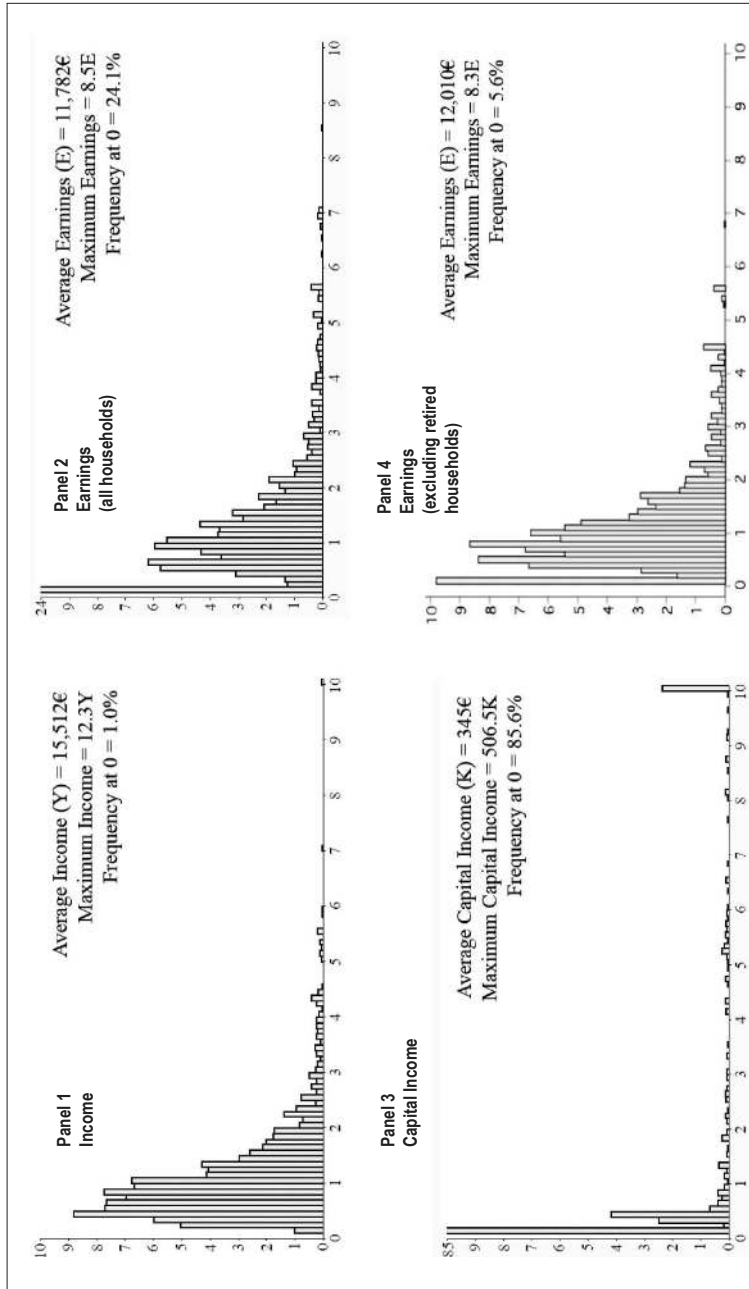
The concentration of a distribution is well described by its Lorenz curve. As figure 2 shows, capital income is by far the most unequally distributed of the three variables, since its Lorenz curve lies significantly below the Lorenz curves of both earnings and income in their entire domains. Earnings are more unequally distributed than income for a similar reason. The fact that income is more equally distributed than earnings is partly due to the equalizing effect of transfers, such as, for example, unemployment benefits and retirement pensions. The diagonal line represents a perfectly equal distribution.

To complement the picture, in table 1 we report the Gini indexes, the coefficients of variation and the ratios of the average income, earnings and capital income earned by the top 10% and the bottom 90% of each distribution. These statistics unambiguously show that income is the most equally distributed of the three variables, and that capital income is the most unequally distributed of the three.

Skewness

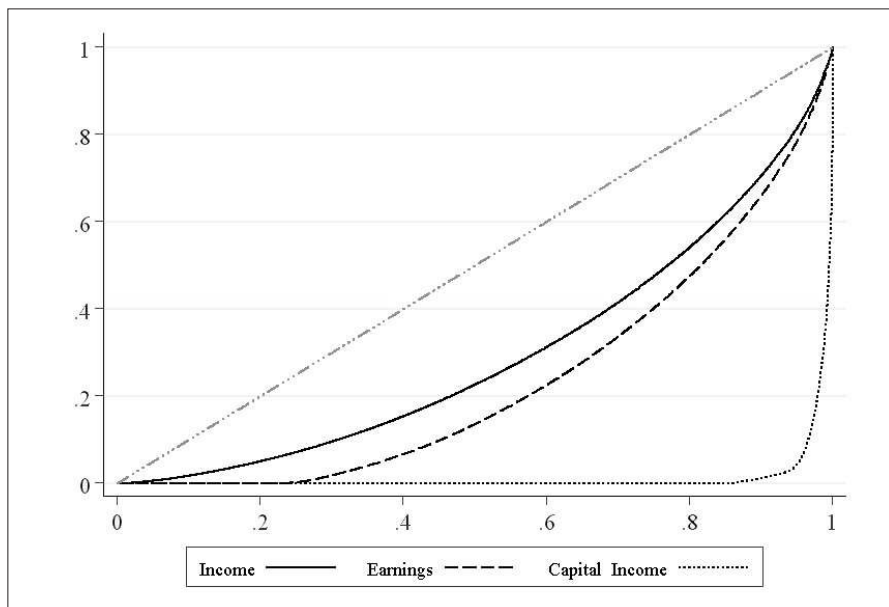
In table 2, we report three measures of the skewness of the income, earnings, and capital income distributions. In symmetric distributions, the mean is located in the 50th percentile, so that the mean-to-median ratio is one. As the skewness to the right of a variable increases, the location of its mean moves to a higher percentile, and its mean-to-median ratio also increases. The first two rows of table 2 report the percentiles in which the

Figure 1. *The Portuguese distributions of income, earnings and capital income. Levels displayed in the horizontal axes have been normalized dividing by the mean. The last observations represent the frequencies of households with more than 10 times the corresponding averages.*



Source: Portuguese Survey of the 2001 European Community Household Panel

Figure 2.
The Lorenz curves of income, earnings, and capital income



Source: Portuguese Survey of the 2001 European Community Household Panel.

means are located and the mean-to-median ratios. According to these two statistics, capital income is by far the most skewed to the right of the three variables³.

The last row of table 2 reports the skewness coefficient proposed by Fisher. This statistic is defined as

$$\gamma = \sum_i f_i (x_i - \bar{x})^3 / \sigma^3$$

where f_i is the relative frequency of realization i , and \bar{x} and σ are, respectively, the mean and the standard deviation of the distribution. This coefficient is zero for symmetric unimodal distributions, it is positive for unimodal distributions that are skewed to the right, and it increases as right-hand skewness of the distributions increases. This statistic confirms that all three distributions are significantly skewed to the right, that capital income is, by far, the most skewed, and that income is somewhat more skewed than earnings.

³As the median capital income is zero (85.6% of the sample households report zero capital income), the mean-to-median ratio of this variable rockets to infinity.

Table 1.
The concentration of income, earnings, and capital income distributions

| | Income | Earnings | Capital Income |
|--------------------------|--------|----------|----------------|
| Gini index | 0.40 | 0.53 | 0.97 |
| Coefficient of variation | 0.85 | 1.06 | 11.98 |
| Top 10% Bottom 90% | 3.76 | 4.64 | 706.52 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

Table 2.
The skewness of the income, earnings and capital income distributions

| | Income | Earnings | Capital Income |
|-------------------|--------|----------|----------------|
| Location of Mean% | 64.4 | 61.0 | 94.2 |
| Mean/Median | 1.26 | 1.23 | |
| Skewness | 3.00 | 2.07 | 35.2 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

Correlation

table 3 reports the correlation coefficients between income, earnings, capital income, and transfers. The data shows that all four variables are positively correlated, albeit to varying degrees. Earnings and income are loosely correlated with capital income (0.37 and 0.36 respectively). The large positive correlation between income and earnings (0.87) is not surprising since earnings account for the lion share of income (75.9% on average). The negative correlation between earnings and transfers (-0.22) can have various interpretations. First, it is further evidence of the large role played by unemployment benefits and particularly retirement pensions. If retirement pensions are excluded, this correlation drops to (-0.04). The remaining negative correlation could be evidence that transfers are indeed going to the most needy, or that the many of the transfer recipients choose not to work.

Table 3.
The correlation between income and its components

| | Income | Earnings | Capital Income | Transfers |
|----------------|--------|----------|----------------|-----------|
| Income | 1 | 0.87 | 0.36 | 0.19 |
| Earnings | 0.87 | 1 | 0.37 | -0.22 |
| Capital Income | 0.36 | 0.37 | 1 | 0.02 |
| Transfers | 0.19 | -0.22 | 0.02 | 1 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

THE POOR AND THE RICH

In tables 4, 5 and 6 we describe the main inequality facts of the income, earnings and capital income distributions along several dimensions. We distinguish between the poor and the rich in terms of income, earnings, and capital income. We organize these facts into two groups: those that pertain to the households in the bottom tails of the distributions, which we refer to generically as the poor, and those that pertain to the households in the top tails of the distributions, which we refer to generically as the rich. We characterize these groups along several socioeconomic dimensions using the characteristics of the household head.

Before presenting the results, it is convenient to note that in the paper we mostly use non-scaled variables⁴. However, equivalized scales are very popular, as they make the income of families with different sizes more comparable. In Appendix B we report the Gini index and selected points of the Lorenz curves of earnings, income and capital income when these variables are transformed using the OECD equivalence scale⁵.

As an additional remark, in table 5 the poorest group is the bottom 30% of the distribution because 24.1% of the sample households report zero earnings. Likewise, the poorest group in table 6 is the bottom 90%. We discuss the main inequality facts that arise from these partitions in the subsections below.

THE INCOME-POOR

In the first four columns of table 4 we report some of the economic characteristics of the bottom percentiles and the bottom quintile of the income distribution. We find that almost every household in the 2001 Portuguese survey of the ECHP reports a strictly positive income. This fact contrasts sharply with the 24.1% of the sample households who report zero earnings, and the 85.6% of the households who report zero capital income. If the households headed by retirees are excluded from the sample, the proportion of households reporting a positive income and zero earnings falls to 5.6%. Naturally, the income of these households is either capital income or transfers. These facts suggest that in Portugal a significant number of working-age households has some form of a safety net, either public or private, that allows them to live without working.

⁴ This choice is based on two considerations. First, most models of economic inequality do not control for heterogeneous household size. Thus, at the stage of calibration, they require statistics based on untransformed variables. Second, the paper reports the household size for all the socioeconomic groups considered. This is a working compromise to show the original variables and, at the same time, take into account differences in household dimension.

⁵ The OECD-equivalized household size, E , is defined as follows: let A be the number of household members who are older than 14, and let S be the household size, then $E = 1 + 0.7 \times (A - 1) + 0.5(S - A)$.

Table 4.
Portuguese households ranked by income

| | The poor | | | Quintiles | | | | | The Rich | | | All |
|---|----------|-------|-------|-----------|-------|-------|-------|--------|----------|-------|--------|--------|
| | 1 | 1-5 | 5-10 | 1st | 2nd | 3rd | 4th | 5th | 10-5 | 5-1 | 1 | |
| Minimum and maximum income (x10 ³ euros) | | | | | | | | | | | | |
| Min income | 0.00 | 1.54 | 2.83 | 0.00 | 6.00 | 10.08 | 14.43 | 21.93 | 29.53 | 39.36 | 65.49 | 0.00 |
| Max income | 1.52 | 2.82 | 4.16 | 6.00 | 10.07 | 14.42 | 21.92 | 190.83 | 39.29 | 65.23 | 190.83 | 190.83 |
| Average income, earnings, capital income and transfers (x10 ³ euros) | | | | | | | | | | | | |
| Avg. income | 0.75 | 2.35 | 3.52 | 3.97 | 8.01 | 12.29 | 17.71 | 35.53 | 33.79 | 50.57 | 79.18 | 15.52 |
| Avg. earnings | 0.33 | 0.21 | 0.38 | 0.95 | 4.88 | 9.58 | 14.28 | 29.17 | 27.74 | 42.07 | 60.82 | 11.78 |
| Avg. cap inc | 0.02 | 0.03 | 0.03 | 0.06 | 0.05 | 0.11 | 0.17 | 1.32 | 0.48 | 2.33 | 8.49 | 0.34 |
| Avg. transfers | 0.40 | 2.10 | 3.11 | 2.96 | 3.08 | 2.60 | 3.27 | 5.05 | 5.56 | 6.17 | 9.87 | 3.39 |
| Shares of the sample totals (%) | | | | | | | | | | | | |
| Income | 0.05 | 0.60 | 1.12 | 5.09 | 10.32 | 15.86 | 22.68 | 45.88 | 10.88 | 12.45 | 6.20 | 100 |
| Earnings | 0.03 | 0.07 | 0.16 | 1.60 | 8.28 | 16.31 | 24.12 | 49.69 | 11.79 | 13.66 | 6.28 | 100 |
| Cap. inc | 0.07 | 0.34 | 0.45 | 3.68 | 3.13 | 6.68 | 9.65 | 76.86 | 7.06 | 25.91 | 30.11 | 100 |
| Transfers | 0.11 | 2.49 | 4.54 | 17.39 | 18.20 | 15.36 | 19.18 | 29.86 | 8.21 | 6.97 | 3.54 | 100 |
| Income sources (%) | | | | | | | | | | | | |
| Labor | 43.45 | 9.05 | 10.72 | 23.85 | 60.86 | 77.94 | 80.61 | 82.10 | 82.11 | 83.19 | 76.81 | 75.94 |
| Capital | 3.18 | 1.24 | 0.89 | 1.60 | 0.67 | 0.93 | 0.94 | 3.70 | 1.43 | 4.60 | 10.73 | 2.21 |
| Transfers | 53.38 | 89.71 | 88.39 | 74.54 | 38.47 | 21.13 | 18.45 | 14.20 | 16.45 | 12.21 | 12.46 | 21.85 |
| Age (%) | | | | | | | | | | | | |
| ≤ 30 | 3.56 | 2.15 | 1.45 | 3.83 | 10.01 | 9.96 | 10.24 | 3.84 | 2.96 | 1.08 | 0.00 | 7.58 |
| 31-45 | 36.05 | 2.23 | 4.34 | 11.47 | 24.32 | 31.32 | 30.42 | 27.30 | 23.80 | 23.85 | 43.33 | 24.97 |
| 46-65 | 43.75 | 24.02 | 21.33 | 24.24 | 36.10 | 38.87 | 41.02 | 57.03 | 63.59 | 63.53 | 46.49 | 39.47 |
| >65 | 16.64 | 71.60 | 72.89 | 60.46 | 29.57 | 19.85 | 18.32 | 11.83 | 9.65 | 11.54 | 10.18 | 27.98 |
| Average age | 51.06 | 70.66 | 70.68 | 65.14 | 53.84 | 50.30 | 49.72 | 51.78 | 53.23 | 52.73 | 49.41 | 54.15 |
| Education (%) | | | | | | | | | | | | |
| ≤ Lower Secondary | 99.65 | 97.77 | 99.38 | 98.37 | 93.42 | 90.30 | 79.19 | 51.30 | 49.37 | 15.54 | 15.48 | 82.49 |
| Secondary | 0.35 | 1.76 | 0.21 | 1.18 | 4.61 | 7.52 | 11.79 | 14.24 | 18.45 | 10.03 | 9.07 | 7.87 |
| Tertiary | 0.00 | 0.47 | 0.42 | 0.46 | 1.97 | 2.18 | 9.02 | 34.46 | 32.17 | 74.42 | 75.44 | 9.64 |
| Employment Status (%) | | | | | | | | | | | | |
| Worker | 11.39 | 2.39 | 5.72 | 11.45 | 39.49 | 52.76 | 49.08 | 55.62 | 44.21 | 70.25 | 59.52 | 41.70 |
| Self-employed | 51.29 | 18.83 | 12.56 | 18.38 | 20.35 | 18.15 | 23.43 | 17.50 | 20.66 | 11.91 | 19.83 | 19.56 |
| Retired | 3.95 | 64.16 | 65.33 | 54.85 | 28.28 | 21.75 | 18.57 | 19.76 | 22.44 | 15.76 | 20.65 | 28.63 |
| Non-worker | 33.36 | 14.62 | 16.40 | 15.32 | 11.88 | 7.34 | 8.92 | 7.12 | 12.69 | 2.08 | 0.00 | 10.11 |
| Marital Status (%) | | | | | | | | | | | | |
| Married | 52.26 | 23.98 | 35.96 | 46.44 | 65.92 | 78.76 | 85.27 | 82.35 | 87.53 | 80.53 | 88.46 | 71.77 |
| Single man | 9.35 | 12.40 | 10.51 | 11.97 | 10.46 | 4.14 | 2.15 | 5.95 | 6.22 | 7.44 | 0.00 | 6.93 |
| Single woman | 38.39 | 63.62 | 53.53 | 41.59 | 23.62 | 17.10 | 12.58 | 11.70 | 6.25 | 12.03 | 11.54 | 21.30 |
| Household size | | | | | | | | | | | | |
| Avg. size | 2.34 | 1.60 | 1.69 | 2.03 | 3.01 | 3.64 | 3.80 | 3.86 | 4.33 | 3.45 | 3.84 | 3.27 |

Source: Portuguese Survey of the 2001 European Community Household Panel

Table 5.
Portuguese households ranked by earnings

| | The poor | | Quintiles | | | The Rich | | | All |
|---|----------|-------|-----------|-------|-------|----------|-------|--------|-------|
| | 0-30 | 30-40 | 3rd | 4th | 5th | 10-5 | 5-1 | 1 | |
| Minimum and maximum income (x10 ³ euros) | | | | | | | | | |
| Min earnings | 0.00 | 4.75 | 6.70 | 11.63 | 18.45 | 25.60 | 35.41 | 63.02 | 0.00 |
| Max earnings | 4.75 | 6.70 | 11.63 | 18.45 | 99.76 | 34.97 | 62.84 | 99.76 | 99.76 |
| Average income, earnings, capital income and transfers (X10 ³ euros) | | | | | | | | | |
| Avg. income | 6.79 | 8.63 | 12.10 | 17.53 | 33.43 | 31.40 | 45.58 | 72.54 | 15.52 |
| Avg. earnings | 0.73 | 5.73 | 9.33 | 14.68 | 30.91 | 29.37 | 45.59 | 71.10 | 11.78 |
| Avg. cap inc | 0.30 | 0.02 | 0.15 | 0.63 | 0.47 | 0.57 | 1.12 | 0.15 | 0.34 |
| Avg. transfers | 5.76 | 2.88 | 2.62 | 2.22 | 2.05 | 1.46 | 1.87 | 1.29 | 3.39 |
| Shares of the sample totals (%) | | | | | | | | | |
| Income | 13.11 | 5.56 | 15.60 | 22.63 | 43.10 | 10.13 | 12.48 | 4.76 | 100 |
| Earnings | 1.84 | 4.87 | 15.84 | 24.96 | 52.48 | 12.47 | 15.43 | 6.15 | 100 |
| Cap. inc | 26.55 | 0.63 | 0.25 | 1.08 | 0.79 | 8.31 | 13.03 | 0.45 | 100 |
| Transfers | 50.88 | 8.48 | 15.43 | 13.09 | 12.11 | 2.15 | 2.19 | 0.39 | 100 |
| Income sources (%) | | | | | | | | | |
| Labor | 10.69 | 66.43 | 77.15 | 83.75 | 92.46 | 93.54 | 93.85 | 98.02 | 75.94 |
| Capital | 4.48 | 0.25 | 1.24 | 3.61 | 1.40 | 1.82 | 2.31 | 0.21 | 2.21 |
| Transfers | 84.83 | 33.32 | 21.62 | 12.64 | 6.14 | 4.64 | 3.84 | 1.77 | 21.85 |
| Age (%) | | | | | | | | | |
| ≤ 30 | 1.38 | 8.74 | 13.26 | 12.63 | 5.54 | 4.92 | 0.96 | 0.00 | 7.58 |
| 31-45 | 7.23 | 27.09 | 31.79 | 33.99 | 34.65 | 35.12 | 26.72 | 51.79 | 24.97 |
| 46-65 | 24.66 | 43.98 | 39.91 | 43.81 | 54.61 | 53.55 | 67.49 | 46.32 | 39.47 |
| >65 | 66.73 | 20.19 | 15.05 | 9.57 | 5.21 | 6.40 | 4.83 | 1.90 | 27.98 |
| Average age | 67.65 | 51.54 | 48.70 | 46.46 | 48.38 | 49.36 | 50.59 | 45.14 | 54.15 |
| Education (%) | | | | | | | | | |
| ≤ Lower Secondary | 94.45 | 93.19 | 88.94 | 83.92 | 51.37 | 50.62 | 18.16 | 4.34 | 82.49 |
| Secondary | 3.35 | 5.30 | 6.98 | 10.28 | 14.41 | 20.70 | 9.98 | 14.85 | 7.87 |
| Tertiary | 2.21 | 1.51 | 4.08 | 5.79 | 34.22 | 28.68 | 71.87 | 80.81 | 9.64 |
| Employment Status (%) | | | | | | | | | |
| Worker | 7.57 | 40.98 | 54.47 | 58.77 | 63.33 | 57.12 | 79.12 | 85.04 | 41.70 |
| Self-employed | 13.45 | 25.66 | 20.21 | 22.78 | 21.77 | 25.22 | 13.30 | 12.52 | 19.56 |
| Retired | 64.22 | 21.61 | 16.98 | 10.03 | 9.09 | 11.39 | 7.33 | 2.45 | 28.53 |
| Non-worker | 14.76 | 11.75 | 8.33 | 8.42 | 5.81 | 6.27 | 0.25 | 0.00 | 10.11 |
| Marital Status (%) | | | | | | | | | |
| Married | 53.97 | 66.07 | 72.69 | 85.90 | 86.16 | 85.43 | 82.45 | 100.00 | 71.77 |
| Single man | 10.27 | 11.53 | 6.23 | 2.54 | 4.74 | 6.19 | 6.73 | 0.00 | 6.93 |
| Single woman | 35.76 | 22.39 | 21.09 | 11.56 | 9.09 | 8.38 | 10.82 | 0.00 | 21.30 |
| Household size | | | | | | | | | |
| Avg. size | 2.13 | 3.64 | 3.50 | 3.91 | 3.92 | 4.03 | 3.64 | 4.05 | 3.27 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

Tabla 6.
Portuguese households ranked by capital income

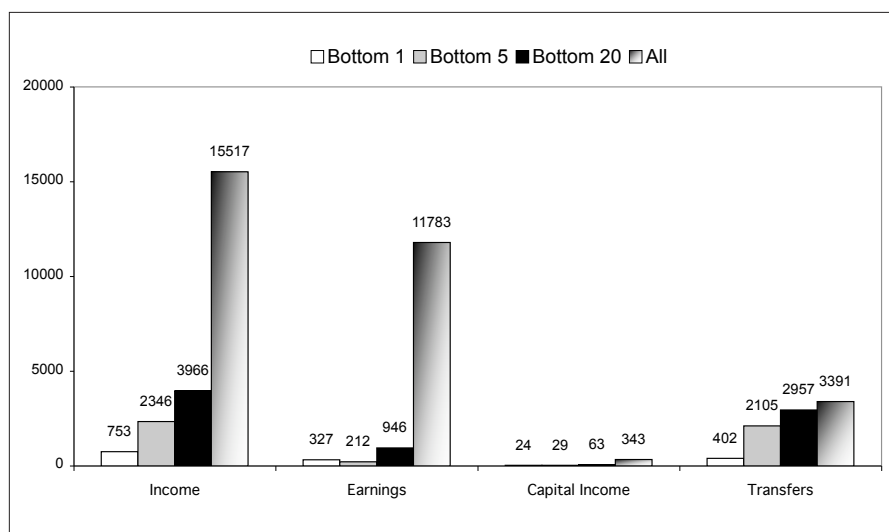
| | The poor | Quintiles | | | The Rich | All |
|---|----------|-----------|-------|-------|----------|-------|
| | 0-80 | 5th | 10-5 | 5-1 | 1 | |
| Minimum and maximum income (x10 ³ euros) | | | | | | |
| Min capital inc | 0.00 | 0.00 | 0.11 | 0.62 | 7.10 | 0.00 |
| Max capital inc | 0.00 | 17.46 | 0.61 | 6.82 | 17.46 | 17.46 |
| Average income, earnings, capital income and transfers (X10 ³ euros) | | | | | | |
| Avg. income | 14.32 | 20.31 | 23.02 | 23.77 | 48.36 | 15.52 |
| Avg. earnings | 11.22 | 14.05 | 18.61 | 13.86 | 21.72 | 11.78 |
| Avg. cap inc | 0.00 | 1.72 | 0.20 | 2.60 | 22.11 | 0.34 |
| Avg. transfers | 3.10 | 4.54 | 4.22 | 7.31 | 4.53 | 3.39 |
| Shares of the sample totals (%) | | | | | | |
| Income | 73.79 | 26.21 | 7.27 | 6.29 | 3.14 | 100 |
| Earnings | 76.12 | 23.88 | 7.73 | 4.83 | 1.86 | 100 |
| Cap. inc | 0.00 | 100.00 | 2.84 | 31.08 | 64.83 | 100 |
| Transfers | 73.18 | 26.82 | 6.09 | 8.84 | 1.35 | 100 |
| Income sources (%) | | | | | | |
| Labor | 78.33 | 69.19 | 80.82 | 58.31 | 44.91 | 75.94 |
| Capital | 0.00 | 8.45 | 0.87 | 10.94 | 45.72 | 2.21 |
| Transfers | 21.67 | 22.36 | 18.32 | 30.75 | 9.37 | 21.85 |
| Age (%) | | | | | | |
| ≤ 30 | 8.43 | 4.16 | 2.85 | 2.05 | 0.73 | 7.58 |
| 31-45 | 25.95 | 21.08 | 20.62 | 14.72 | 10.93 | 24.97 |
| 46-65 | 38.80 | 42.14 | 50.06 | 41.90 | 46.89 | 39.47 |
| >65 | 26.82 | 32.62 | 26.48 | 41.33 | 41.45 | 27.98 |
| Average age | 53.43 | 57.00 | 56.69 | 60.00 | 63.34 | 54.15 |
| Education (%) | | | | | | |
| ≤ Lower Secondary | 84.69 | 73.74 | 62.31 | 67.45 | 67.32 | 82.49 |
| Secondary | 7.80 | 8.14 | 6.47 | 6.72 | 13.18 | 7.87 |
| Tertiary | 7.51 | 18.13 | 31.22 | 25.83 | 19.50 | 9.64 |
| Employment Status (%) | | | | | | |
| Worker | 42.92 | 36.87 | 45.41 | 19.19 | 17.21 | 41.70 |
| Self-employed | 18.91 | 22.14 | 14.28 | 30.33 | 28.84 | 19.56 |
| Retired | 27.73 | 32.20 | 32.54 | 42.53 | 35.83 | 28.53 |
| Non-worker | 10.44 | 8.79 | 7.77 | 7.95 | 18.12 | 10.11 |
| Marital Status (%) | | | | | | |
| Married | 71.09 | 74.47 | 76.55 | 78.52 | 82.13 | 71.77 |
| Single man | 6.87 | 7.20 | 5.81 | 7.38 | 0.59 | 6.93 |
| Single woman | 22.05 | 18.32 | 17.65 | 14.09 | 17.28 | 21.30 |
| Household size | | | | | | |
| Avg. size | 3.29 | 3.20 | 3.26 | 3.31 | 3.50 | 3.27 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

We find that the households in the bottom percentile of the income distribution (the income-poorest) are extremely poor, that they are mostly self-employed, middle-aged, have a low educational attainment, and tend to be single. Moreover, we find that the Portuguese income-poorest receive more than 50% of their income from transfers. We discuss each of these features in the paragraphs immediately below.

Specifically, the average income of the income-poorest was only 753 euros, which is 4.8% of the sample average household income. This number more than triplicates when we move to the bottom 1-5% of the distribution (2,346 euros), and it increases by more than five times when we move to the bottom quintile (3,966 euros). In figura 3 we report the average income, earnings and capital income of the income-poor. Not surprisingly, the income-poor tend to be among the earnings-poor and the capital income-poor as well. More specifically, the average earnings and capital income of the households in the first quintile of the income distribution are 946 and 63 euros, respectively, i.e., 0.8% and 18.4% of the respective sample averages. In turn, their average transfers are 2,957 euros, a value that represents 87.2% of the sample average. The results for the income-poorest are qualitatively similar.

Figure 3.
Average income, earnings, capital income and transfers of the income poor (in euros)



Source: Portuguese Survey of the 2001 European Community Household Panel.

Regarding the shares of income accounted for by transfers, we find that transfers account for 53.4% of the income of the households in the bottom percentile of the income distribution, while this number jumps to 89.7%, 88.4% and 74.5% when we move to the bottom 1-5%, the bottom 5-10%, and the bottom quintile, respectively. This could mean that the income-poorest benefit to a large extent from social assistance and other non-contributive public transfers.

Amongst the income-poorest, a striking 45.7% of the household heads report self-employment to be their primary occupation. This number is 30 percentage points above the sample average (15.9%), and it decreases rapidly as we move to the bottom 1-5% and the bottom 5-10% of the income distribution (12.1% and 9.5%, respectively). In contrast, amongst the 2001 income-poorest less than 5% of the households were headed by retirees. Surprisingly, this number jumps to 58.0% when we consider the bottom quintile of the income distribution. This share is well above the sample average (23.2%), suggesting that the Portuguese pension system makes it possible for the elderly to escape from extreme income poverty but not from severe income deprivation.

Interestingly, an overwhelming 96.4% of the heads of the income-poorest households belong to the lowest education category. This number, which is similar to the corresponding one for the bottom quintile of the distribution, steadily declines as we move to higher quantiles of the distribution.

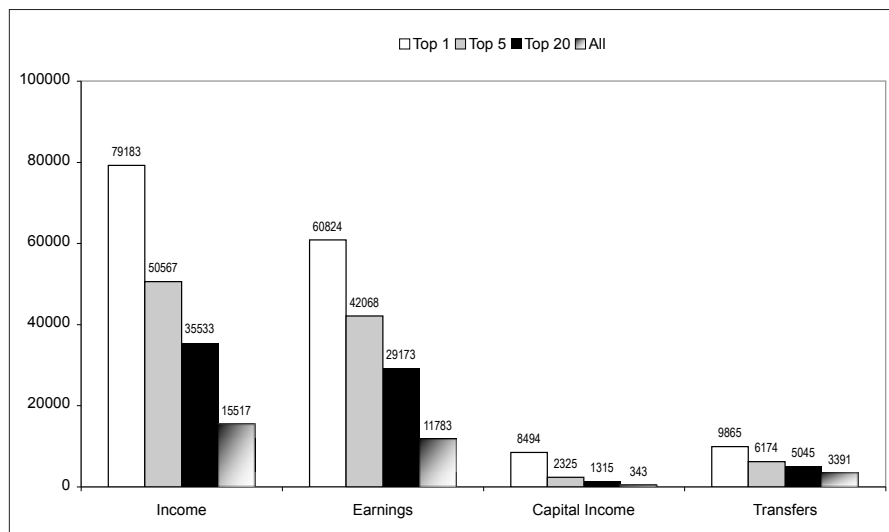
Many income-poor households were headed by single females: 39.5% of those in the bottom percentile, and 43.8% of those in the bottom quintile. These numbers contrast sharply with the 20.4% figure obtained for the total sample.

The earnings-poor

As mentioned above, 24.1% of the Portuguese ECHP households report zero labour earnings. In spite of this fact, the average income of households in the bottom 30% of the earnings distribution is relatively large (6,790 euros), and it would put these households in the second quintile of the income distribution. This group of households receives the lion share of total transfers (50.9%), and transfers account for almost all (84.8%) of this group's income.

As could be expected, the heads of the earnings-poor households tend to be old (66.6% are over 65), uneducated (93.1% have not completed upper secondary education), and are retired (64.4%). Many of the households in this group are headed by single women (37.1%), and the average household size of this group (2.1 people) is rather small. This is partly because this group of households includes a significant number of widows who live alone. Specifically, 8.3% of the sample households were headed by widows who lived alone.

Figure 4.
Average income, earnings, capital income and transfers of the income rich (in euros)



Source: Portuguese Survey of the 2001 European Community Household Panel.

The capital income-poor

An overwhelming majority of Portuguese households (85.6%) report zero capital income. This is partly because the ECHP does not impute any rent to owner-occupied houses, and over 89.0% of the sample households report that they own the houses in which they live. Given its large size, the group of households with zero capital income is very close to the sample averages in every dimension of inequality.

The income-rich

In the last columns of table 4 we report some of the economic characteristics of the top quintile and the top percentiles of the income distribution. We find that the households in the top income percentile earn on average 5.1 times the sample's average income, and that this number drops to 2.3 times when we consider the households in the top quintile of the income distribution. As figure 4 shows, the income-rich tend to be also among the earnings-rich as well as the capital income-rich. In particular, the average earnings and capital income of the households in the top quintile of the income distribution (29,173 and 1,315 euros, respectively) situates them in the top 10% of the earnings distribution

and the top 5% of the capital income distribution. Similarly, the average earnings and capital income of the households in the top percentile of the income distribution (60,824 and 8,494 euros, respectively) situates them in the top 5% of the earnings distribution and in the top 1% of the capital income distribution.

We also find that capital income is extremely concentrated in the hands of the income-rich. Specifically, the households in the top percentile of the income distribution receive 30.1% of the total sample capital income, and this number increases to 76.9% when we consider the top quintile. These facts notwithstanding, the income-richest receive a share of total transfers (3.5%) that is significantly larger than the share received by the bottom percentile (0.1%).

Among the income-richest, only 7.5% were over 65. A very large number household heads in the top 1% of the income distribution (89.3%) report that they have completed college. This number decreases for the top 1-5% of the income distribution and drops dramatically for the top 10-5% and the top quintile of the distribution (75.2% and 48.2%, respectively). Most household heads in the top percentile of the income distribution (73.1%) are wage earners, no one is a non-worker, and a significant fraction is retired (15.9%).

Finally, the income-rich are mostly married, and they tend to live in large households. Specifically, 80.2% household heads in the top 1% of the income distribution are married, and the average size of these households is 3.8 people. These numbers are very similar to the corresponding numbers in the top quintile (74.5% and 3.9 people, respectively) and remarkably larger than the sample averages (65.6% and 3.3 people, respectively).

The earnings-rich

As table 5 shows, the average earnings of the households in the top quintile (the earnings-rich) are almost 2.6 times the sample's average, and the average earnings of those in the top 1% of the earnings distribution (the earnings-richest) are 6.0 times the sample's average earnings.

We find that the shares of income accounted for by capital income and transfers are rather small for these two groups of households. Specifically, capital income accounts for 0.8% of the income of the earnings-rich, and transfers account for 12.1%. In the case of the earnings-richest these numbers are 0.5% and 0.4%, respectively.

Probably, the most remarkable feature is the connection between education and earnings. The proportion of household heads with tertiary education in the top quintile of the earnings distribution is 44.0% and this number increases up to 94.1% when we consider the top 1% of the distribution. These figures are, respectively, 3.5 and 7.5 times above the corresponding figure for the total sample. Overall, this pattern is consistent with Martins and Pereira' (2004) finding that in Portugal the returns to education are particularly large, probably due to the low proportion of high-educated workers.

Finally, we find that among the earnings-richest, most household heads are married (86.9%) and tend to live in large households (4.1). In fact, both the average share of married households and the average household size of the quintiles of the earnings partition are increasing in earnings.

The capital income-rich

The total capital income is in the hands of a small fraction of households (14.4%). The households who belong to the top 1% of the capital income distribution (the capital income-richest) earn 64.8% of the total sample capital income. When compared with the rest of the households in the sample, the average capital income of these households is also very large. Specifically, the capital income-richest earn 65 times the sample average. These two facts notwithstanding, capital income accounts for a relatively small share of total income for the households in the top tail of the capital income distribution (45.7% in the case of the top percentile).

Another outstanding feature of the capital income partition is that it is mostly the old who are capital income rich. Specifically, the share of households in the top capital income percentile who are older than 45 is 73.3%. Finally, among the capital income-richest the proportion of married people (78.0%), university graduates (31.1%), and self-employed individuals (35.7%) is well above the sample averages (65.6%, 12.6% and 15.9%, respectively).

Age and inequality

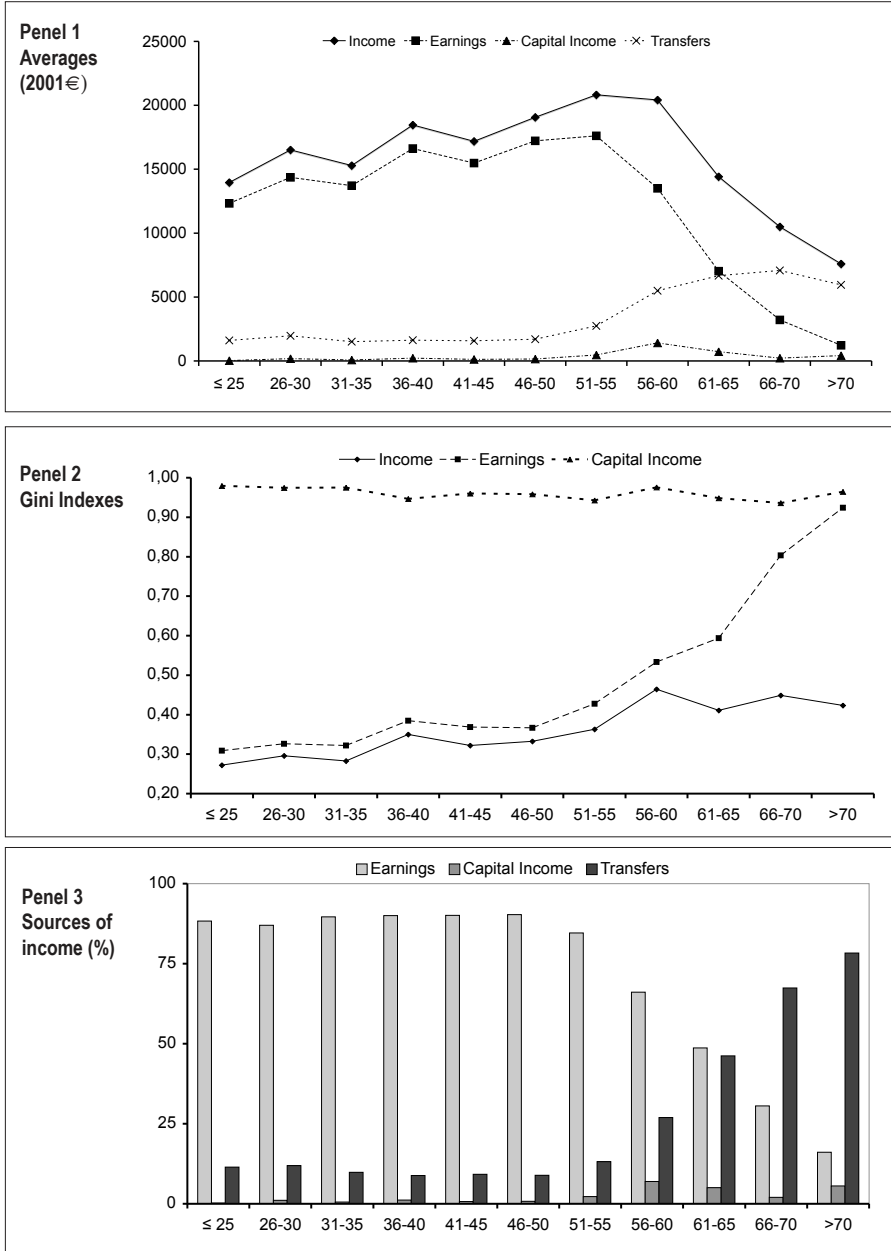
Some of the income differences across households can be attributed to age. Ideally, we would like to follow a sample of households through their entire lifecycles to compare the lifetime inequality statistics with their yearly counterparts. Unfortunately, the ECHP is not long enough for this purpose, and this forces us to use cross-sectional data to quantify the age-related differences in inequality.

Specifically, we do the following: we partition the 2001 Portuguese ECHP sample into 11 cohorts according to the age of the household heads, we compute the relevant statistics for each cohort, and we compare them with the corresponding statistics for the entire sample. These statistics are the cohort average income, earnings, capital income, and transfers and their respective Gini indexes; the average shares of income earned by each cohort from various income sources; the number of people per household in each cohort and the relative cohort size.

These statistics are shown in figure 5. In Panel 1 we represent the average income, earnings, capital income, and transfers of each cohort. As this figure illustrates, earnings displays the typical hump-shape conventionally attributed to the life-cycle. Perhaps more interestingly, the life-cycle patterns of capital income and transfers differ significantly. More specifically, average cohort capital income is moderately increasing until age 60, and it drops again thereafter. On the other hand, average cohort transfers are clearly increasing with age. The sharpest increase occurs after age 55, when households' heads retire and start receiving their pension plans. Altogether, the life-cycle behavior of these variables implies that income also displays the familiar life-cycle hump-shape, with the highest level in the 51-55 cohort.

In Panel 2 of figure 5 we represent the Gini indexes of income, earnings, and capital income of the age cohorts. The Gini index of capital income is very similar across cohorts.

Figure 5.
Portuguese households partitioned by age



Source: Portuguese Survey of the 2001 European Community Household Panel.

As opposite, the Gini indexes of income and, particularly, earnings are highly increasing with age. For earnings, it is as low as 0.31 for the under-25 cohort and, after age 55, it increases sharply up to 0.80 in the 66-70 cohort and 0.92 in the above-70 cohort. This finding is not surprising since the number of households whose earnings are zero increases very significantly around the retirement age and thereafter.

Finally, in Panel 3 of figure 5 we represent the income sources of the age cohorts. Their shapes are also very characteristic. The share of income accounted for by earnings shows low variation until age 56 while, thereafter, it declines sharply, from 84.6% in the 51-55 cohort to 16.1% in the above-70 cohort. As opposite, the share of transfers is remarkably low until the 51-55 cohort, and it rises steadily thereafter, from 13.2% to 78.3% in the above-70 cohort. Finally, the share of income accounted for by capital income is less than 2% until age 51, and between 2% and 6% thereafter.

Employment status and inequality

In this subsection the Portuguese ECHP sample is partitioned into workers, the self-employed, retirees and non-workers, according to the occupation declared by the heads of the households. In figure 6 we report the average income, earnings, capital income, and transfers; the Gini indexes for income, earnings, and capital income; the shares of income obtained from various sources; the number of people per household; and the relative size of each employment status group.

In Panel 1 we represent the average income, earnings, capital income, and transfers of the employment status groups. It turns out that the differences across these groups are substantial. Workers make up 54.5% of the sample and they are by far the largest group. Their income is 17.6% higher than the sample average, and their earnings are 37.7% higher, but their average capital income and transfers are significantly smaller than the sample average. The self-employed households make up 15.9% of the sample, their average income and their average capital income are close to the sample averages, but their average transfers are 34.2% lower than the sample average. The retirees account for 23.2% of the sample. Relative to workers and self-employed households, their average income is 40.8% and 30.0% lower, respectively, but their average transfers are 4.5 and 3.5 times larger. Finally, households headed by a non-worker account for 6.4% of the sample. Their average income is very close to the average income earned by the retirees, but their earnings and capital income are larger and their transfers smaller.

In Panel 2 of figure 6 we depict the Gini indexes of income, earnings, and capital income for the employment status groups. Income and earnings are most equally distributed amongst workers and most unequally distributed amongst the retired. The Gini indexes of capital income are very similar for all the employment status groups.

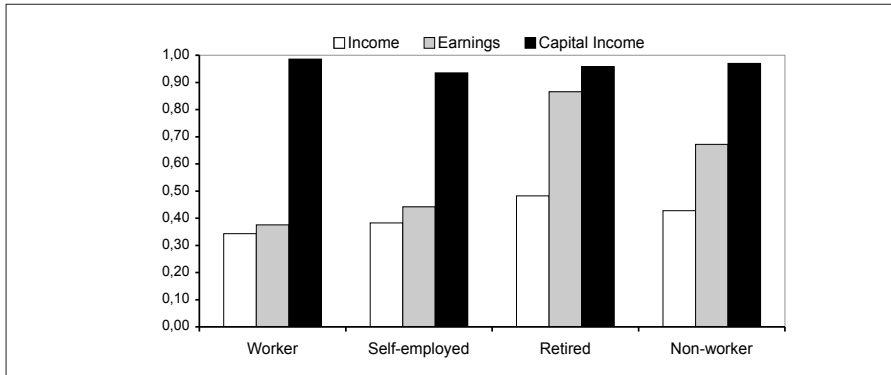
In Panel 3 of figure 6 we focus on the different income source. The shares of income accounted for by labour, capital, and transfers differ significantly with the primary occupation of the household heads. The most noteworthy feature of this figure is the significant

Figure 6.
Portuguese households partitioned by employment status

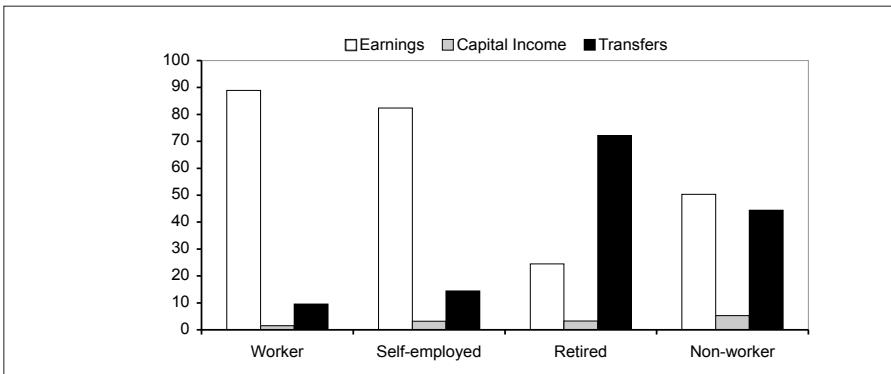
Panel 1: Averages (in euros)



Panel 2: Gini indexes

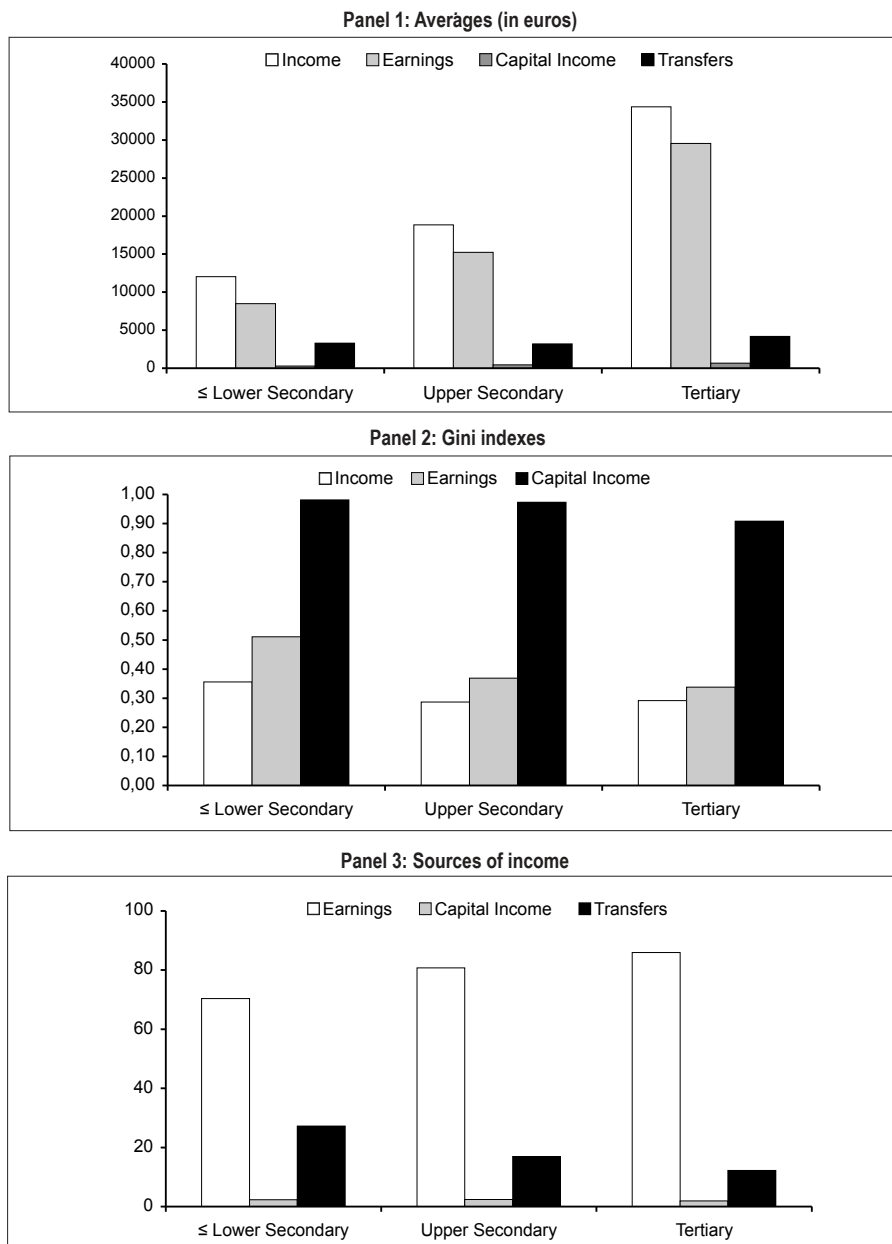


Panel 3: Sources of income (%)



Source: Portuguese Survey of the 2001 European Community Household Panel.

Figure 7.
Portuguese households partitioned by education (%)



Source: Portuguese Survey of the 2001 European Community Household Panel.

share of transfers obtained by the retirees (72.2%), and the fact that labour income, presumably earned by other household members, accounts for 50.3% of the income of the households headed by a non-worker. It is also remarkable that this group is also the second largest recipient of transfers (44.4%). Finally, we find that the retired tend to belong to households that are smaller than average.

EDUCATION AND INEQUALITY

To document the relationship between education and inequality, the 2001 Portuguese ECHP sample is partitioned into three education groups based on the level of education attained by the head of the household.

In Portugal, the fraction of household heads with less than upper secondary education is remarkably large (77.6%). The remaining groups, upper secondary and tertiary education, account for 9.9 and 12.6 of the sample, respectively. The average income, earnings, capital income, and transfers of the education groups are depicted in panel 1 of figure 7. There is a close association between the education level and the economic performance of households. Specifically, the average income of tertiary and upper secondary education households are, respectively, 2.9 and 1.6 larger than the income of the less than upper secondary group. Earnings, capital income and transfers display a similar pattern, suggesting that as far as economic performance is concerned, the high educated are the king of the hill in Portugal.

As panel 2 of figure 7 illustrates, the concentrations of income and capital income are similar across education levels. This is not the case with earnings, which are most unequally distributed amongst the less educated households.

In panel 3 of figure 7, we represent the income sources of the education groups. The shares of income accounted for by earnings are clearly increasing in the education level, while the opposite occurs with transfers. The share of income accounted for capital income is very small in all education groups (about 2%), and it is slightly lower in the tertiary group. Finally, the differences in household size across the three education groups are relatively small.

MARITAL STATUS AND INEQUALITY

The household's composition can be closely related to its economic performance. To investigate this, we split the Portuguese households into different marital status groups. We differentiate between married, single with dependents and single without dependents. We also subdivide these last two groups according to the sex of the household heads. In figure 8 we report the averages for income, earnings, capital income, and transfers; the Gini indexes for income, earnings, and capital income; the shares of income obtained

from various sources; the number of people per household; and the relative group sizes for these marital status groups.

As it is apparent, married households make substantially higher income, earnings, and capital income than their single counterparts. However, this is not the case if we divide the income of married households by two to account for double-income households⁶. When we compare singles with and without dependents, we find that singles with dependents are somewhat better off than singles without dependents, due to higher earnings and despite the latter receive a larger amount of capital income and transfers.

We also find that income and earnings are most unequally distributed amongst single households without dependents, particularly among those headed by women. In contrast, the concentrations of capital income are fairly similar across all the marital status groups.

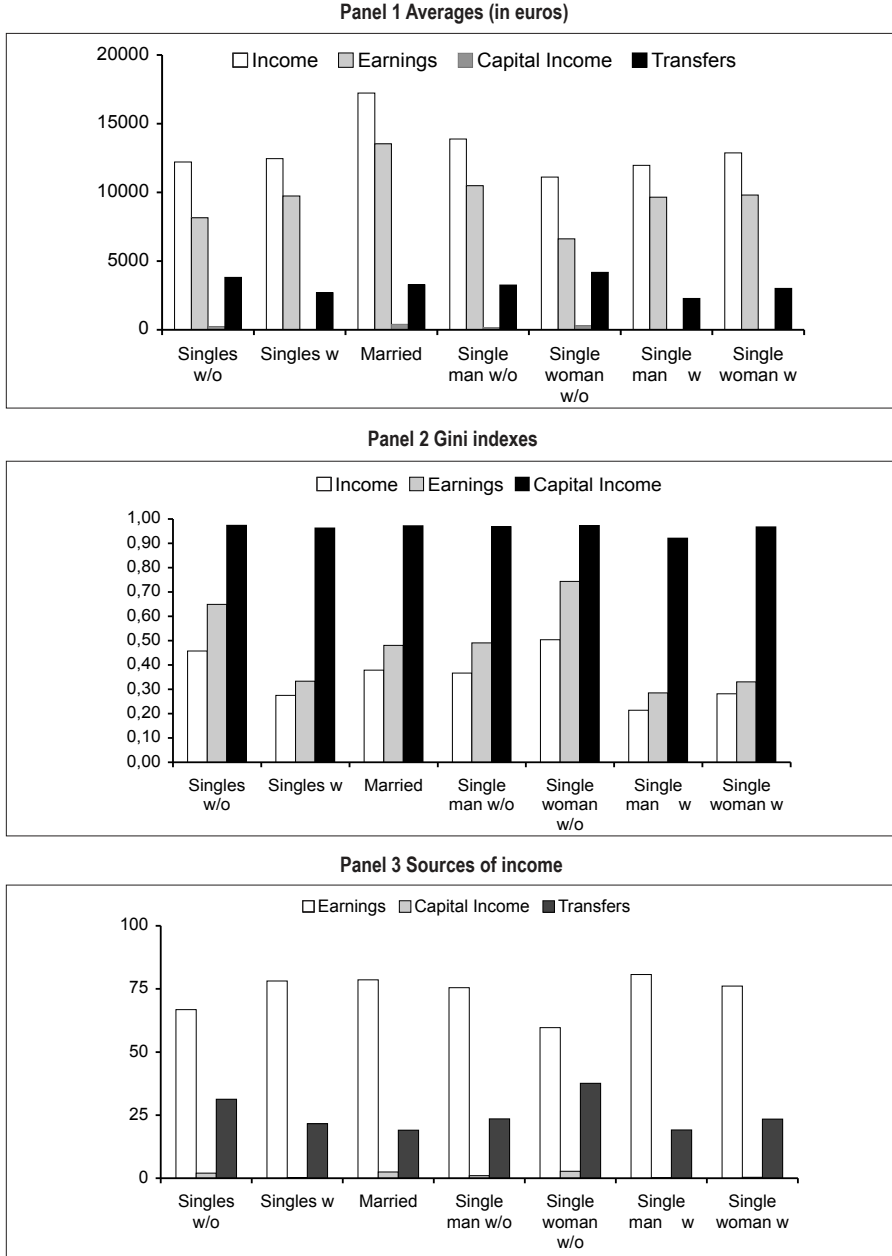
As far as the sources of income are concerned, we find that the share of income accounted for by earnings is very similar for married households and for those headed by singles with dependents. On the other hand, this share is significantly smaller for households headed by singles without dependents. The opposite happens in the case of transfers. Specifically, we find that transfers account for 31.3% of the income of singles without dependents, and only for 21.6% of the income of singles with dependents. This is not surprising since retired widows are mostly singles without dependents, in general they do not work, and they receive a significant share of retirement pensions and other social security transfers.

Next, we consider the partition of single households according to the sex of the household heads. Not surprisingly, the households headed by single females outnumber those headed by single males (20.4% against 14.0%). The average earnings of single females without dependents are 368% lower than the average earnings of single males, but their average capital income and transfers are 110.3% and 21.1% larger, respectively. Altogether, single females without dependents end up earning 20.0% less income than their male counterparts. This is not the case of single households with dependents. In this group, the average income earned by women is 7.6% higher than the average income earned by men. This is mostly due to the fact that women with dependents receive an amount of transfers that is 31.9% higher than the amount of transfers obtained by their male counterparts.

Furthermore, the data show that income and earnings are more unequally distributed amongst households without dependents, and that differences between men and women are small for both the group with dependents and the group without dependents. Finally, as figure 8 illustrates, households headed by single females, both with and without dependents, earn smaller shares of their income from earnings and larger shares from transfers than the corresponding groups headed by single males.

⁶ But it is still the case if we use either equalized income or per-capita income to account for the above-average size of married households.

Figure 8.
Portuguese households partitioned by marital status (%)



Income mobility

People move up and down the economic scale; they do not stay in the same income, earnings, and capital income groups forever. Aging is perhaps the main cause for this type of economic mobility, but it is certainly not the only one. Mobility is also affected by the results of business projects and other ventures that can bring about significant changes in earnings to lucky or unlucky entrepreneurs. There can also be some other radical expressions of good luck (such as gambling), or bad luck (such as accidents). Furthermore, other changes in economic groups are a consequence of the conscious effort of households to smooth their consumption over time. Whatever its cause, economic mobility makes inequality an essentially dynamic phenomenon.

The ECHP allows for the possibility of continuously monitoring the same group of families and individuals over the years. In this section, we take advantage of this feature to compute the 1994-2001 income mobility matrix of the Portuguese households⁷. It must be noted, however, that changes in total income without any control for changes in household dimension may be rather misleading at this stage. Changes in living arrangements may result into large household income variation while maintaining the economic possibilities of household members practically unchanged (due to the variation of the household size). To control for this apparent mobility, we use equalized income rather than total income when computing the mobility statistics.

The first entry in the mobility matrix reported in table 7 shows that 63.1% of the households in the bottom income quintile in 1994 were also in the bottom income quintile in 2001. The table also shows that none of the households that were in the first quintile in 1994 were in the top quintile in 2001. Reversely, 1.8% of the households that were in the highest quintile in 1994 fell to the lowest quintile in 2001⁸.

For some purposes, the mobility statistics reported in table 7 might still contain too much information, and it might be useful to have a simpler, one-dimensional summary statistic for each variable. One such statistic is a simple arithmetic transformation of the second-highest eigenvalue of the mobility matrix⁹. The closer this eigenvalue is to 1, the more persistent is the variable under study (Shorrocks, 1978). Consequently, the closer one minus the second-highest eigenvalue is to 1, the more mobile is the variable under study. We report this statistic in the first column of table 8. In the remaining columns, we report the fractions of the households of the quintiles of the income distribution that have moved to a different quintile during the seven years lapsed between 1994 and 2001. We call these fractions the mobility statistics. To evaluate the roles played by age and

⁷ The mobility statistics reported in this section are based on the 4,265 households that were present in both the 1994 and the 2001 waves.

⁸ In the 1994 wave income is given in the Portuguese national currency, the *escudo*. We have transformed this variable into euros using the entry exchange rate 200.482 escudos = 1 euro.

⁹ Note that the highest eigenvalue of probability transition matrices is always 1.

Table 7.
Income Mobility of Portuguese households (1994 - 2001)

| From 1994 | To 2001 | | | | |
|-----------|---------|-------|-------|-------|--------|
| | 0-20 | 20-40 | 40-60 | 60-80 | 80-100 |
| 0-20 | 63.1 | 30.9 | 5.4 | 0.5 | 0.0 |
| 20-40 | 21.8 | 41.1 | 29.6 | 7.5 | 0.0 |
| 40-60 | 10.6 | 19.7 | 34.0 | 34.0 | 1.8 |
| 60-80 | 4.5 | 12.9 | 16.6 | 39.1 | 26.9 |
| 80-100 | 1.8 | 0.8 | 9.9 | 16.6 | 70.9 |

Source: 1994 and 2001 Portuguese Surveys of the European Community Household Panel.

Table 8.
Mobility statistics of Portuguese households (1994 - 2001)

| | <i>fa</i> | 1st Q | 2nd Q | 3rd Q | 4th Q | 5th Q |
|--------------|-----------|-------|-------|-------|-------|-------|
| Allb | 0.23 | 36.9 | 58.9 | 66.0 | 60.9 | 29.1 |
| Non-retiredc | 0.21 | 42.4 | 62.6 | 62.2 | 56.9 | 16.6 |
| Age 25-45d | 0.28 | 47.7 | 61.6 | 53.6 | 49.5 | 8.6 |

a.- This column reports one minus the second highest eigenvalue of the corresponding mobility matrices.

b.- The last five columns of this table report the fraction of the households of each quintile that moved to a different quintile from 1994 to 2001.

c.- This row reports the mobility statistics of income for households whose head had not retired in 2001

d.- This row reports the mobility statistic of income for households whose heads were between 25 and 45 years old in 1994.

Source: 1994 and 2001 Portuguese Surveys of the European Community Household Panel.

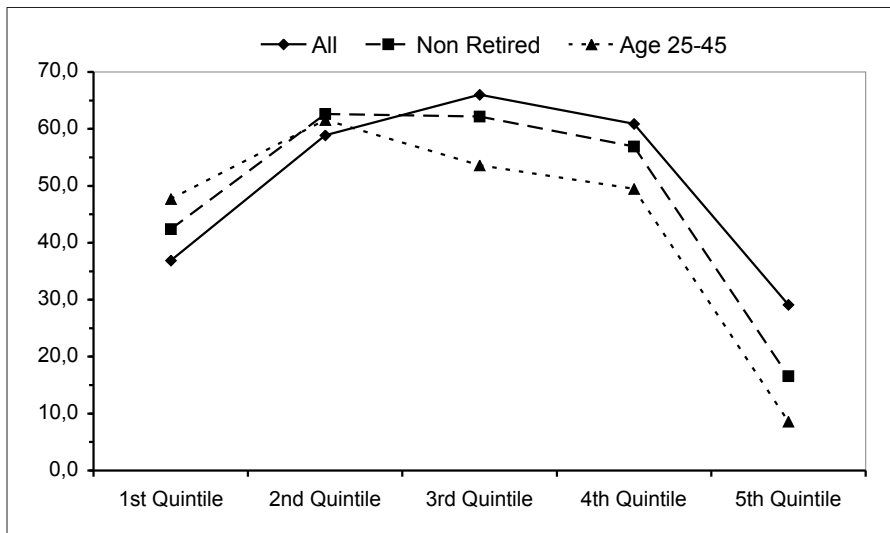
employment status in shaping economic mobility, in the second row of that same table we report the mobility statistics for the sample households whose head had not retired in 2001, and in the third row those for the sample households whose head was between 25 and 45 years old in 1994.

To facilitate the analysis, in figure 9 we represent the mobility statistics by income quintiles. In all three cases, the profiles are clearly hump-shaped. This is due to the fact that households in the extreme quintiles can only move either up or down the economic scale, while the households in the middle quintiles can move both up and down.

Three conclusions can be inferred from the results. First, mobility among the 25-45 age group and the non-retired tends to be upward, while mobility among the retired tends

to be downward. Thus, for example, we find that while only 36.9% of the households that were in the first quintile moved to a different quintile in 2001, among the households whose head was non-retired or in the 25-45 age group this rate rises to 42.4% and 47.7%, respectively. Reversely, we find that while 29.1% of the households moved out from the top quintile, among the households in the non-retired or the 25-45 age group this rate falls to 16.6% and 8.6%. Second, the extent of upward mobility among the non-retired is lower than the extent of downward mobility among the retired. Accordingly, the statistic of average mobility reported in table 8 is lower among the non-retired (0.21) than in the total sample (0.23). In turn, households in the 25-45 age cohort are more mobile than average (0.28). This might be due to the fact that labour earnings growth among individuals in the 25-45 age group is relatively high as compared to younger and older individuals. The third conclusion is that income-rich families (and, particularly, those headed by younger individuals) are very likely to maintain their rank in the distribution. This finding warns that economic mobility is a phenomenon that generally takes place in the mid and bottom part of the distribution.

Figure 9.
Mobility by income quintiles (1994–2001). Source: Portuguese Surveys of the 1994-2001 European Community Household Panel.



THE DETERMINANTS OF ECONOMIC STATUS AND ECONOMIC MOBILITY

In this section, we turn to regression analysis to investigate how and to what extent the different socioeconomic factors considered in the paper contribute to i) economic status and ii) economic mobility. We concentrate on household income, as it stands as the most representative variable.

The analysis is based on a Generalized Ordered Probit (GOP) model where the household position in the distribution is explained in terms of the attributes of the household head. The estimates show how closely each independent variable is related to the household rank holding all other influences constant. Even though we are tempted to refer to the estimates as “impacts”, they should not be interpreted as causal effects. This would require controlling for the potential endogeneity of the right hand side variables, which is beyond the scope of the present paper. Rather, our results are aimed to obtain a quantitative assessment on the relative contribution of each factor to income status and income mobility.

Income status

Our analysis is similar to that of the household income regression model developed by Bourguignon *et al.* (2005), in which household income is explained in terms of the household characteristics. However, as we are more interested in distributions than in levels, we will concentrate on the household rank in the distribution rather than on the total household income.

We denote the household position in the income distribution by Q_i , a categorical variable ranking from 1 (first quintile) to 5 (fifth quintile). This variable is modelled as a function of the demographic attributes of the household head,

$$Q_i = \hat{a}_0 + \hat{a}_1 Age_i + \hat{a}_2 Age_i^2 + \hat{a}_3 Secondary_i + \hat{a}_4 Tertiary_i + \hat{a}_5 Single_Man_i + \hat{a}_6 Single_Woman_i + \hat{a}_7 Selfemployed_i + \hat{a}_8 Retired_i + \hat{a}_9 Nonworker_i + e_i \quad (1)$$

where $Secondary_i$ and $Tertiary_i$ are dummies to account for the educational status of the household head, $Single_Man_i$ and $Single_Woman_i$ are dummies activated when the household head is respectively, a single man or a single woman, and $Selfemployed_i$, $Retired_i$ and $Nonworker_i$ are dummies to account for the employment status of the household head. Admittedly, there are other factors that may be correlated with household income and that do not enter in our regression. However, we stick to a parsimonious specification in order to concentrate only in the dimensions discussed in the present paper, and to highlight the main relationships contained in the data.

A first empirical strategy to estimate this model would consist on an Ordered Probit (OP) model. However, the marginal probabilities given by this model have two restrictive properties that do not extract all potential information contained in the data (Stewart, 2003, Boes and Winkelman, 2006). First, the relative impact of two given covariates on the dependent variable is constant across the outcome distribution. In our setting, this assumption corresponds to assuming that the ratio of marginal probability effects of two distinct variables (secondary and tertiary education, for instance) is the same across quintiles. This may be inappropriate, insofar as there is no presumption that the relative contribution of each variable holds constant across segments of the distribution. The second restriction is the so-called “single crossing property”. In the OP model, marginal probability effects change their signs exactly once when moving from the smallest to the largest outcome. This means that if, for instance, retirement increases the probability of being among the income-poor, then it must decrease the probability of being among the income-rich. Obviously, this may be not the case if a large fraction of low-income retirees coexists with some retirees being among the income-richest.

To avoid these restrictions, we use a Generalized Ordered Probit (GOP)¹⁰ rather than the standard OP model. In our model, therefore, all the parameters are outcome-specific, allowing for a more flexible characterization of the marginal probability effects across the income distribution.

In table 9 we report the marginal probability effects of the different covariates. These effects are relative to a (reference) household whose head has average age, less than secondary education, is married and works as a wage earner. The first line, for example, shows that households headed by older individuals are more prone to be in the upper quintiles of the income distribution. Specifically, being one year older decreases the probability of being in the first and second quintiles by 1.7 and 1.4 percentage points (pp), respectively, and raises the probability of being in the fourth and fifth quintiles by 1.3 and 1.9 pp, respectively. The last column is a summary statistic that captures the average effect of a given covariate on the dependent variable, Q_r . It shows that, *ceteris paribus*, a ten-year increase in age results in a one-quintile increase. The coefficient on age squared shows that this effect is decreasing in age.

But, probably, the most important result is the close association between education and income. Having secondary and, particularly, tertiary education decreases the probability of being in the bottom 20% of the income distribution by more than 15 pp. Reversely, the probability of being in the top quintile of the distribution rises by as much as 57 pp when the household head has tertiary education, an by 19.2 pp when it comes to secondary education. The last column shows that, *ceteris paribus*, an individual with primary education will be almost one quintile below an individual with secondary edu-

¹⁰ For a description of this model, see Stewart (2003) and Boes and Winkelman (2006).

Table 9.
Marginal probability effects on income quintile

| | 1st | 2nd | 3rd | 4th | 5th | E[Q] |
|------------------------|-----------------------|-----------------------|-----------------------|----------------------|-----------------------|----------------------|
| Age | -0.017*** (-7.25) | -0.014*** (-4.87) | 0.000 (0.02) | 0.013*** (4.97) | 0.019*** (11.29) | 0.10*** (14.21) |
| Age squared (x1000) | 0.020*** (8.81) | 0.016*** (5.55) | -0.003*** (1.21) | -0.015*** (-5.97) | -0.018*** (-10.79) | -1.09*** (-15.55) |
| Secondary | -0.157*** (-9.82) | -0.154*** (-7.33) | 0.016 (0.66) | 0.103*** (4.08) | 0.192*** (7.99) | 0.89*** (13.93) |
| Tertiary | -0.233*** (-23.75) | -0.279*** (-23.43) | -0.154*** (-11.16) | 0.096*** (3.86) | 0.570*** (21.9) | 1.92*** (38.34) |
| Single man | 0.083*** (3.71) | 0.037 (1.56) | -0.080*** (-3.98) | -0.057*** (-3.24) | 0.017 (1.20) | -0.22*** (-3.99) |
| Single woman | 0.264*** (12.8) | 0.063*** (3.06) | -0.132*** (-8.34) | -0.133*** (-9.54) | -0.062*** (-7.05) | -0.82*** (-17.97) |
| Self-employed | -0.190*** (-9.74) | 0.055*** (2.62) | 0.114*** (5.84) | 0.031* (1.71) | -0.009 (-0.77) | 0.29*** (5.14) |
| Retired | 0.046** (1.95) | -0.033 (-1.23) | 0.008 (0.33) | -0.010 (-0.44) | 0.011 (0.69) | -0.13** (-1.88) |
| Non-worker | 0.094*** (2.93) | -0.005 (0.15) | 0.004 (0.12) | -0.062** (-2.48) | -0.031** (-1.83) | -0.36*** (-4.25) |
| Log likelihood | -5871.85 | | | | | |
| LR test against OP | 356.69*** | | | | | |
| No. of obs | 4588.00 | | | | | |

Notes: * signals significant at the 10% level, ** signals significant at the 5% level, and *** signals significant at the 1% level.

cation and practically two quintiles below an individual with tertiary education. In other words, an additional level of education is associated with a one-quintile increase.

As regards the remaining variables, we find that households headed by single individuals, retirees and non-workers are more likely to be in the lower segments of the distribution. Though illustrative, the average effects reported in the last column of table 9 obscure some asymmetric effects taking place across the distribution. Thus, for example, retirement raises the probability of being in the lower income quintile but, in turn, does not decrease the probability of being in the upper quintile. This result suggests that even though a substantial fraction of the retirees are among the income-poor, some others benefit from high income levels. Similarly, self-employment reduces the probability of being in the lower quintile but does not raise the probability of being among the income-

rich. We must note that these asymmetric effects would have been obscured by an OP model due to the “single cross property”. In table 9 we report the likelihood ratio test between the GOP model and the standard OP model. The statistic (356.7) is significant at the 1% confidence level, indicating that the OP model is rejected.

Income mobility

Next, we turn to the determinants of income mobility between 1994 and 2001. Our purpose is to know what characteristics differentiate those who manage to improve their economic status from those who remain poor. To control for changes in household dimension we use equivalized income rather than total household income.

Our empirical strategy is closely related to previous work by Zaidi *et al.* (2007) and Zaidi and Gustaffson (2007), who use an ordered response model to tests how different demographic factors affect income mobility in the UK, Netherlands and Germany. Still, our analysis has two distinct features. First, rather than explaining variations in the households' position in the income distribution, we model the position of households in the 2001 income distribution. This choice allows us to explicitly illustrate how the household's position in the end of the sample period (2001) is related to the starting position (1994). Second, we use a GOP model rather than the more standard multinomial logit. As mentioned above, this choice is motivated by the fact that there is no presumption that those attributes that significantly affect the probability of moving into the lower quintiles are precisely those affecting the probability of moving into the upper quintiles.

We model the income quintile of household i in 2001 ($Q_{i,01}$) as a function of the characteristics of the household head in 1994, the changes in those characteristics between 1994 and 2001, and the starting income quintile ($Q_{i,94}$),

$$Q_{i,01} = \hat{a}_0 + \hat{a}_1 Q_{i,94} + \hat{a}_2 Age_{i,94} + \hat{a}_3 Age_{i,94}^2 + \hat{a}_4 Secondary_{i,94} + \hat{a}_5 (\Delta Secondary_{i,01}) + \hat{a}_6 Tertiary_{i,94} + \hat{a}_7 (\Delta Tertiary_{i,01}) + \hat{a}_8 Single_Man_{i,94} + \hat{a}_9 (\Delta Single_Man_{i,01}) + \hat{a}_{10} Single_Woman_{i,94} + \hat{a}_{11} (\Delta Single_Woman_{i,01}) + \hat{a}_{12} Selfemployed_{i,94} + \hat{a}_{13} (\Delta Self_employed_{i,01}) + \hat{a}_{14} Retired_{i,94} + \hat{a}_{15} (\Delta Retired_{i,01}) + \hat{a}_{16} Nonworker_{i,94} + \hat{a}_{17} (\Delta Nonworker_{i,01}) + ei \quad (2)'$$

Here, the symbol Δ denotes variation between 1994 and 2001. Thus for example, $\Delta Single_Man_{i,01} = Single_Man_{i,01} - Single_Man_{i,94}$. This variable takes value 1 if the household head entered this group after 1994, 0 if he kept his initial status, and -1 if he left this group after 1994. Thus, we assume that the effects of entering and leaving a specific group between 1994 and 2001 are equal but with opposite sign. Finally, we note that, according to our specification, the reference household was headed in 1994 by a middle-aged, married person, who worked as a wage earner, had less than secondary education and was in the middle part of the income distribution.

In table 10 we report the marginal probability effects. Consistent with the mobility measures reported in Section 9, we detect a strong correlation between the starting ($Q_{i,94}$) and the final position ($Q_{i,01}$) in the distribution. The lower estimates in the top and the bottom quintiles indicate that this relation is looser among households who end up in the extreme tails of the 2001 distribution.

We find that age is negatively (positively) associated with downward (upward) income mobility, though at a decreasing rate. Still, the most remarkable result in table 10 is, again, the close association between education level and income mobility. Families headed by a household head with secondary and, particularly, tertiary education tend to move up in the income distribution. The probability of ending up in either the fourth or the fifth income quintile is $22.6+8.7=31.3$ pp higher among those who had secondary education in 1994, and as high as $12.7+33.2=55.9$ pp higher among those who had a university degree in 1994. According to the last column, two individuals starting in the same quintile in 1994, one with primary education, one with tertiary education, are expected to end up in two different quintiles after the end of the period. Likewise, we find that individuals who completed secondary or tertiary education after 1994 were more likely to end up in a higher quintile. All in all, the results show that in Portugal education is an important engine for boosting upward economic mobility.

Income mobility is also related to the marital status of the household head. Specifically, families headed by a single adult in 1994 show a higher risk of downward mobility, relative to families whose household head was married in 1994. This risk, moreover, is about two times larger among women than among men (5.0 against 2.6 pp in the first quintile and 32.5 against and 13.9 pp in the second quintile). Changes in living arrangements play also their role. Women who became single household heads after 1994 (presumably, due to divorce or widowhood) were more prone to experience downward mobility. This effect was, on average, 5.5 times larger than among men (-0.60 against -0.11), as shown in the last column of table 10.

Finally, our results show that employment status is an additional determinant of downward economic mobility. Specifically, we find that the risk of moving down the income distribution is lower among workers and higher among the retired, the non-workers and the self-employed. It is interesting to note, however, that the effects of employment status tend to vanish when we move up along the distribution.

All in all, these results have social policy relevance since they show that income losses, or downward income mobility, are more probable precisely among those who are already poor. Earlier in the paper we reported that households headed by uneducated, single and young individuals were generally poorer. The results in table 10 show that these characteristics are also associated to a higher probability of downward income mobility. It is important to note that these effects are significant even after controlling for the household starting position in the distribution, i.e., after removing the impact of those unfavourable characteristics (observable and non-observable) that put the household in a low quintile of the 1994 distribution. It seems, therefore, that certain socio-economic characteristics are related not only to income deprivation, but also to lower chances of

Table 10.
Marginal probability effects on the 2001 income quintile.

| | 1st | 2nd | 3rd | 4th | 5th | E[Q] |
|---------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|----------------------|
| Q ₉₄ | -0.014*** (-3.36) | -0.204*** (-9.47) | -0.232*** (-8.44) | 0.376*** (16.95) | 0.074*** (4.60) | 0.92*** (-55.83) |
| Age | -0.000** (-2.38) | -0.003 (-1.12) | -0.014** (-2.12) | 0.012* (1.72) | 0.006*** (2.66) | 0.04*** (-4.39) |
| Age squared (x1000) | 0.008*** (2.90) | 0.075*** (2.80) | 0.149** (2.26) | -0.160** (-2.41) | -0.060*** (-2.94) | -0.52*** (-6.5) |
| Secondary | -0.003** (-2.14) | -0.074*** (-4.60) | -0.236*** (-4.83) | 0.226*** (4.04) | 0.087*** (2.68) | 0.49*** (-6.05) |
| ΔSecondary | -0.008* (-1.80) | -0.062 (-1.60) | -0.121 (-1.63) | 0.161** (2.27) | 0.030*** (2.77) | 0.38*** (-4.35) |
| Tertiary | -0.004*** (-2.77) | -0.063* (-1.73) | -0.392*** (-7.91) | 0.127 (1.46) | 0.332*** (4.15) | 1.10*** (-9.32) |
| ΔTertiary | 0.003 (0.46) | -0.154** (-2.19) | -0.344*** (-2.91) | 0.428*** (3.74) | 0.067*** (3.58) | 0.81*** (-6.83) |
| Single man | 0.026** (2.43) | 0.139*** (3.43) | 0.038 (0.72) | -0.189*** (-4.45) | -0.014** (-2.52) | -0.45*** (-6.93) |
| ΔSingle man | 0.002 (0.99) | 0.012 (0.44) | 0.028 (0.43) | -0.033 (-0.5) | -0.009 (-0.74) | -0.11*** (-1.47) |
| Single woman | 0.050*** (3.58) | 0.325*** (7.96) | -0.035 (-0.77) | -0.319*** (-11.24) | -0.021*** (-3.47) | -0.82*** (-16.51) |
| ΔSingle woman | 0.011** (2.11) | 0.013 (0.28) | 0.352*** (3.19) | -0.316*** (-2.81) | -0.060** (-2.41) | -0.60*** (-3.95) |
| Self-employed | 0.022*** (3.30) | 0.075*** (2.75) | -0.013 (-0.27) | -0.083* (-1.77) | -0.001 (-0.13) | -0.29*** (-4.86) |
| ΔSelf-employed | 0.003** (-2.00) | 0.007 (0.33) | -0.084 (-1.6) | 0.051 (0.93) | 0.023** (2.14) | 0.03 (-0.40) |
| Retired | 0.032*** (3.28) | 0.256*** (5.88) | -0.044 (-0.82) | -0.241*** (-5.26) | -0.002 (-0.27) | -0.49*** (-6.99) |
| ΔRetired | 0.006*** (3.19) | 0.048** (2.43) | 0.071 (1.41) | -0.132*** (-2.6) | 0.008 (1.05) | -0.15*** (-2.47) |
| Non-worker | 0.047*** (2.71) | 0.155*** (2.68) | -0.060 (-0.78) | -0.142** (-1.97) | 0.000 (-0.01) | -0.47*** (-5.18) |
| ΔNon-worker | 0.007*** (2.91) | 0.062** (2.52) | -0.019 (-0.31) | -0.068 (-1.09) | 0.018* (1.75) | -0.18** (-2.36) |
| Log likelihood | -2627.2 | | | | | |
| LR test against OP | 82.168*** | | | | | |
| No. of obs | 4265.00 | | | | | |

Note: * denotes significant at the 10% confidence level, ** significant at the 5% confidence level, *** denotes significant at the 1% confidence level.

improving the economic status or, reversely, to a higher probability of being worse-off over time. This finding warns policy makers that certain population groups with already low income levels present a high risk of severe poverty.

Theoretical implications

Accounting for the earnings, income and wealth distributions observed in modern societies has been a recurrent theme in the literature. To try to understand facts reflected in data, economists create theories, expressed through mathematical models, that are meant to capture the features that best account for those facts. Then they test the theories by having the models generate distributions and comparing the models' distributions with the facts.

When explaining inequality, some authors have put the focus on living arrangements (Chun and Lee, 2001, Cubbedu and Ríos-Rull, 2003, Antonovics and Town, 2004), entrepreneurship (Quadri, 2000, Gentry and Hubbard, 2004), discrimination (Altonji and Blank, 1999) and, since Atkinson's (1971) seminal work, ageing (Deaton and Paxson, 1994, 2001). Labour market characteristics, such as education, tenure, union membership and occupation have also received a lot of attention as determinants of earnings inequality (Asplund and Barth, 2005).

Up to date, however, the resemblance between the models' and the data's distributions is not satisfactory. Most of this puzzle arises from the long and thin top tail of the earnings, income and, particularly, wealth distribution, and the differences in the mobility patterns of different population groups (Castañeda *et al.*, 2002). This suggests that additional or more refined ingredients must be added to the theories of inequality in order to account for the facts.

The results reported in this paper contribute to the debate by showing that, first, some factors are definitely more closely related to inequality and mobility than others and, second, that the role of a specific characteristic may importantly differ across segments of the distribution.

Education is, at least in Portugal, the most important determinant not only of income status but of income mobility as well. The estimates reported in the last column of table 9 show the size of the tertiary education effect on income quintile determination (1.92) is between 2.4 and 6.6 times larger than the size of the marital status-gender effect (0.82 for single woman and 0.22 for single men), between 5.3 and 14.8 times larger than the employment status effect (0.36, 0.29 and 0.13, respectively), and as large as the effect of a 27-year increase in age ($0.10 \times 27 - 0.00109 \times (27)^2 \approx 1.92$). The results for mobility reported in table 10 are similar, with education and changes in education being the most important factor explaining transitions across quintiles. With this evidence at hand, we conclude that heterogeneous human capital should be at the core of any theory of inequality aiming to explain the Portuguese earnings, income and, presumably, wealth distributions.

The second dimension is living arrangements. Married households earn significantly more and are more prone to improve their position in the income distribution. The avai-

lable evidence, still scarce, suggests that this may be due to more ability and capacity to assume responsibilities in the job as well as to a higher degree of specialization of tasks within the household (Chun and Lee, 2001, Antonovics and Town, 2004). The significantly lower income earned by singles and the remarkably higher risk of downward mobility among this group confirms that differences in family structure across households and over time should be a key ingredient when modelling income inequality. Reinforcing the gender, divorce and widowhood channels would also help in bringing theory closer to the data.

Finally, Quadrini (2000) and Gentry and Hubbard (2004) argue that entrepreneurship plays a major role in generating income and wealth inequality. Using US data, they show that entrepreneurs (the self-employed) have higher savings rates, which allows them to accumulate wealth, raise capital income, and experience greater upward mobility. This is not the case in Portugal, where self-employment is not an important determinant of economic performance.

The second theoretical implication arising from the results is that theories of inequality cannot rely on a single factor to simultaneously account for the upper and the lower tails of the distribution. The role played by the different factors differs across segments of the distribution. In table 9 and 14 we found that the marginal probability effects of education are higher in the upper quintiles than in the lower quintiles. This suggests that educational differences may go a long way towards explaining the long and thin top tail of the income distribution. In turn, differences in living arrangements and, to a lesser extent, differences in employment status are more influential in the lower segments of the distribution than in the upper segments. Indeed, singlehood is more influential than education when explaining income deprivation or downward income mobility among women. Accordingly, modelling employment status and living arrangements should reinforce the capacity of a given theory of inequality to explain income deprivation and the dynamics of poverty spells.

CONCLUSIONS

In this paper we provided an anatomy of the extent and dimensions of economic inequality in Portugal. The data were taken from the European Community Household Panel dataset (ECHP), a standardized survey carried out in the European Union from 1994 to 2001. We gathered detailed and up-to-date information data on the income, earnings and capital income earned by the Portuguese households to describe the range, shape, concentration and skewness of the resulting distributions. We found that capital income is, by far, the most unequally distributed variable, while income is the most equally distributed, partly due to the equalizing effect of transfers.

We characterized the socioeconomic profile of households located in different parts of the distribution. We found that households in the bottom quintile of the income and earnings distribution tend to be headed by old, single individuals, women and low educated

persons. Income- and earnings-rich households, in turn, are mostly headed by middle-aged, married individuals, who work as wage earners and have university education. We found that the capital income-richest receive 64.8% of the total sample capital income and tend to be old, married, self-employed and relatively well educated.

To examine more closely the relation between household attributes and inequality, we partitioned the sample into age, education, marital status and employment groups. Among other findings, we showed that: i) income and earnings are increasing until age 55 and, thereafter, transfers and capital income compensate only partially the earnings loss associated with retirement; ii) individuals working as wage earners fare better than the self-employed who, in turn, make up about 50% more income than the retired and the non-workers; iii) differences across education levels are impressively large, with tertiary educated individuals reporting annual earnings and income between two and three times higher than those reported by individuals with, respectively, secondary and primary education; iv) married households are substantially richer than their single counterparts. Single women without dependents are particularly poor.

Then, we moved to multivariate regression analysis to consider all the socioeconomic factors simultaneously. Specifically, we examined how the different household attributes (age, education, marital status and employment) contribute to inequality. The econometric approach, based on a Generalized Ordered Probit model, allowed us to uncover the differential effect that some attributes have in different parts of the income distribution. The most remarkable finding was that education is by and large the most important factor explaining not only the household position in the income distribution, but the probability of moving up the distribution as well. We concluded that differences in human capital should be the basis of a successful theory of inequality.

We expect that the facts reported in the present paper contribute to a better understanding of economic inequality in Portugal. Examining in detail the causal relation between demographic characteristics, the unequal opportunities that individuals face, the functioning of labour markets, the role of institutions, and the scope of the public system of transfers, on the one hand, and overall inequality and its evolution over time, on the other hand, are directions for further research. Similarly, a theory of inequality that is consistent with most of the facts reported in this paper is still waiting.

APPENDIX A. DEFINITIONS OF VARIABLES

The definitions of income, labour earnings, capital income, and transfers used in this article are the following:

- Income: defined as the sum of labour earnings, capital income and transfers (ECHP variable: HI100).
- Labour earnings: defined as the sum of net labour income from both paid employment and from self-employment (ECHP variable: HI111).

- Capital income: defined as the sum of net capital income and net property income (ECHP variables: HI121+HI122).

- Transfers: defined as the sum of both private and public transfers. Private transfers include both inter-vivos transfers and bequests. Public transfers include retirement pensions and old-age benefits, unemployment compensation and other work-related transfers, survivors benefits, illness and disability benefits, family benefits, education grants, social aid, housing subsidies, and other public transfers (ECHP variables: HI123+HI130+HI132+HI133+HI134+ HI135+HI136+HI137+HI138).

Observations with missing values in one or more of the above variables were dropped from the sample. This reduced the sample size from 4,614 to 4,588 observations. Every statistic reported in this paper has been calculated using the sample weights provided by the ECHP (variable HG004). The weights are designed to compensate for the unequal selection probabilities and response rates of the various household and aim to make the sample representative of the Portuguese population.

APPENDIX B. USING SCALE UNITS TO DESCRIBE THE EARNINGS, INCOME AND CAPITAL INCOME DISTRIBUTIONS

Table B1.

The Portuguese income distribution (Share of the sample totals) - Scaled households

| | Gini | The poor | | | Quintiles | | | | | The Rich | | | All |
|--------|------|----------|------|------|-----------|-------|-------|-------|-------|----------|-------|------|-------|
| | | 1 | 1-5 | 5-10 | 1st | 2nd | 3rd | 4th | 5th | 10-5 | 5-1 | 1 | |
| Income | 0.30 | 0.12 | 1.28 | 1.75 | 9.22 | 13.49 | 16.25 | 21.52 | 39.41 | 10.75 | 10.26 | 3.64 | 100.0 |

Source: Portuguese Survey of the 2001. European Community Household Panel.

Table B2.

The Portuguese earnings distribution (Share of the sample totals) - Scaled households

| | Gini | The poor | | Quintiles | | | The Rich | | | All |
|----------|------|----------|-------|-----------|-------|-------|----------|-------|------|-------|
| | | 0-30 | 30-40 | 3rd | 4th | 5th | 10-5 | 5-1 | 1 | |
| Earnings | 0.51 | 2.20 | 4.35 | 15.70 | 26.02 | 51.72 | 12.81 | 13.89 | 3.62 | 100.0 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

Table B3.
The Portuguese capital income distribution (Share of the sample totals) - Scaled households

| | Gini | The poor | | The Rich | | All |
|----------------|------|----------|------|----------|-------|-------|
| | | 0-80 | 10-5 | 5-1 | 1 | |
| Capital income | 0.98 | 0.00 | 4.42 | 31.10 | 63.95 | 100.0 |

Source: Portuguese Survey of the 2001 European Community Household Panel.

APPENDIX C. INTERNATIONAL COMPARISONS

In table C1 we report the Gini index and selected points of the Lorenz curves of the income distributions of several countries, including France, Germany, Italy, Spain, Sweden, UK, Germany and the US. We also construct the Lorenz curve of income of the eight European countries put together and we call the resulting aggregate EU7.

Before advancing, two remarks are in order. First, it is convenient to stress that the comparisons between the European countries and the US should be taken cautiously. The US data is taken from the 1998 Survey of Consumer Finances (SCF). Unlike the ECHP, the SCF is not a panel. Instead, 70% of the SCF sample is replaced every year. In addition, one of the main concerns of the SCF is to offer an accurate representation of the top tail of the wealth distribution. Consequently, unlike the ECHP, the SCF oversamples the rich and minimizes top coding. This feature of the SCF is bound to result in more measured inequality in the US than in the European countries. For details on the SCF, see Budría *et al.* (2002). Second, in order to make the results more comparable, the statistics reported in this section are taken from the 1998 waves of the ECHP and the SCF. The reason is that this year is the latest common year in the two datasets.

Probably the most striking feature of Table C1 is that income is indeed more unequally distributed in the US than in every European country considered here. The share of income earned by the households in the bottom quintile of the U.S. income distribution (2.4%) is almost half of the 4.4% earned by the poorest of the European poor, who happen to be the Portuguese, and exactly one-third of the 7.2% earned by the income poor Swedes, who are the richest amongst the European poor. When we consider the top tails of the distribution, we find that the rich households in the US sample are significantly richer than their European counterparts. Specifically, the households in the top quintile of the US income distribution earn 58.0% of the total sample income, which is 12.1 percentage points more than the share earned by the richest top quintile amongst the European countries (Portugal again) and 19.8 percentage points more than the poorest European top quintile (Sweden again). The differences in the top percentile are even more striking, but they must be interpreted with care because a large share of these differences is due to the overrepresentation of the US rich in the SCF sample.

Another noticeable feature of Table C1 is that the differences in income inequality

amongst the European countries considered here are not very large. According to the Gini indexes, income is most unequally distributed in Portugal (0.41) and is least unequally distributed in Sweden (0.32). The shares of income earned by the different groups are also quite similar in the various European countries. Specifically, the maximum differences are 2.8 percentage points amongst the bottom quintile and 7.7 percentage points amongst the top quintile.

In Table C2 we report the Gini indexes, the coefficients of variation and the locations of the means of the income, earnings and capital income distributions of the eight countries listed above. In brackets besides each statistic we report the ranking of each country according to the statistic reported in each column.

Both the Gini indexes and the coefficients of variation confirm that, in every single country, capital income is the most unequally distributed of the three variables, that earnings ranks second, and that income is the most equally distributed of the three. Amongst the European countries, the range of the capital income Gini indexes (from 0.80 in France to 0.97 in Portugal) is significantly larger than the ranges of the Gini indexes of either earnings (from 0.53 in Portugal to 0.60 in the UK) or income (from 0.32 in Sweden to 0.41 in Portugal). This same property of the data is confirmed by the coefficients of variation. Notice also the curious case of Portugal: while its labour earnings are the most equally

Table C1.
International comparisons: the income distribution

| | Gini | The Poor | | | Quintiles | | | | | The Rich | | |
|---------------------------------|------|----------|-----|------|-----------|------|------|------|------|----------|------|------|
| | | 1 | 1-5 | 5-10 | 1st | 2nd | 3rd | 4th | 5th | 10-5 | 5-1 | 1 |
| Shares of the sample totals (%) | | | | | | | | | | | | |
| Portugal | 0,41 | 0,0 | 0,5 | 1,0 | 4,4 | 10,4 | 16,2 | 23,2 | 45,9 | 11,3 | 12,2 | 5,6 |
| France | 0,35 | 0,0 | 0,7 | 1,5 | 6,3 | 11,8 | 17,1 | 23,7 | 41,0 | 9,9 | 10,4 | 4,9 |
| Germany | 0,34 | 0,0 | 0,6 | 1,4 | 6,2 | 12,3 | 17,7 | 24,2 | 39,6 | 9,8 | 9,8 | 4,1 |
| Italy | 0,35 | 0,0 | 0,7 | 1,4 | 6,1 | 11,9 | 17,1 | 24,3 | 40,7 | 9,9 | 10,4 | 4,3 |
| Spain | 0,39 | 0,0 | 0,6 | 1,4 | 5,4 | 10,7 | 15,9 | 23,3 | 44,6 | 10,7 | 11,1 | 6,4 |
| Sweden | 0,32 | 0,5 | 0,8 | 1,8 | 7,2 | 12,3 | 17,5 | 24,8 | 38,2 | 9,2 | 9,1 | 4,2 |
| UK | 0,39 | 0,0 | 0,6 | 1,3 | 5,4 | 10,4 | 16,0 | 24,4 | 43,7 | 10,5 | 11,1 | 5,4 |
| Germany | 0,34 | 0,0 | 0,6 | 1,4 | 6,2 | 12,3 | 17,7 | 24,2 | 39,6 | 9,8 | 9,8 | 4,1 |
| EU7 | 0,37 | 0,0 | 0,6 | 1,3 | 5,7 | 11,3 | 16,7 | 24,0 | 42,3 | 10,3 | 10,9 | 4,9 |
| USA | 0,55 | -0,1 | 0,1 | 0,5 | 2,4 | 7,2 | 12,5 | 20,0 | 58,0 | 10,3 | 15,3 | 17,5 |

distributed amongst the European countries, its capital income is the most unequally distributed. Finally, both the Gini indexes and the coefficients of variation confirm that economic inequality is above average in Portugal. As far as the skewness of the distributions is concerned, the last panel of Table C2 establishes that all three distributions are skewed to the right in every one of the countries considered, and that the skewness of the Portuguese distributions is towards the high end of each range.

Tabla. C2.
International comparisons: concentration and skewness statistics

| | Income | Earnings | Capital Income |
|----------------------------------|----------|----------|----------------|
| Gini indexes | | | |
| Portugal | 0.41 (7) | 0.53 (1) | 0.97 (8) |
| France | 0.35 (3) | 0.57 (5) | 0.80 (1) |
| Germany | 0.34 (2) | 0.56 (3) | 0.83 (3) |
| Italy | 0.35 (3) | 0.54 (2) | 0.93 (6) |
| Spain | 0.39 (5) | 0.57 (5) | 0.95 (7) |
| Sweden | 0.32 (1) | 0.56 (3) | 0.84 (4) |
| UK | 0.39 (5) | 0.60 (7) | 0.84 (4) |
| USA | 0.55 (8) | 0.61 (8) | 0.80 (1) |
| Coefficients of variation | | | |
| Portugal | 0.84 (7) | 1.07 (2) | 7.96 (8) |
| France | 0.78 (4) | 1.24 (7) | 2.88 (2) |
| Germany | 0.66 (2) | 1.08 (3) | 4.23 (4) |
| Italy | 0.68 (3) | 1.04 (3) | 4.56 (5) |
| Spain | 0.81 (5) | 1.13 (5) | 6.12 (6) |
| Sweden | 0.63 (1) | 1.08 (3) | 3.94 (3) |
| UK | 0.81 (5) | 1.23 (6) | 2.85 (1) |
| USA | 3.57 (8) | 2.65 (8) | 6.53 (7) |
| Locations of the means | | | |
| Portugal | 63 (7) | 59 (6) | 93 (8) |
| France | 60 (4) | 58 (4) | 80 (1) |
| Germany | 58 (1) | 54 (1) | 82 (4) |
| Italy | 59 (3) | 54 (1) | 87 (6) |
| Spain | 62 (6) | 58 (4) | 91 (7) |
| Sweden | 58 (1) | 55 (3) | 80 (1) |
| UK | 61 (5) | 59 (6) | 83 (5) |
| USA | 71 (8) | 65 (8) | 81 (3) |

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