

A characterization of income and consumption inequality in Portugal

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Abstract

This paper aims to characterize the evolution of household income and consumption inequality in Portugal between 1995 and 2015. In this period, income inequality showed an upward profile in the first decade and a downward path afterwards, while consumption inequality decreased significantly over the entire period. Based on a pseudo panel, we estimate the role of the life cycle and of the different cohorts in explaining household inequality. In line with the literature, it is concluded that income and expenditure inequality increases over the life cycle. In turn, there is a decrease in inequality in successive cohorts in Portugal, particularly in the case of consumption. The article suggests that the strengthening of income and consumption smoothing mechanisms in the Portuguese economy may have contributed to this evolution. (JEL: D12, D15, D31, E21, E24)

Introduction

Inequality is increasingly a central theme in economic analysis. In the new emerging consensus in the literature, knowledge about the heterogeneity of agents and the distribution of income, wealth and consumption are necessary conditions to understand the sources of economic fluctuations, the transmission of economic shocks and the impact of public policies on economic welfare (Blundell, 2014; Kaplan and Violante, 2018).

This article aims to contribute to the characterization of the evolution of household income and consumption inequality in Portugal in the last two decades. The article is part of a growing but still limited literature on the determinants and implications of economic inequality in Portugal (Cantante, 2019; Costa *et al.*, 2020; Banco de Portugal, 2018). The analysis is based on

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the five Household Expenditure Surveys conducted by Statistics Portugal between 1995 and 2015.

The paper presents a breakdown of income and consumption inequality over the life cycle of households and across the various cohorts covered by the surveys (from the 1920s to the 1990s). The decomposition is performed based on a pseudo panel constructed for this purpose. In line with the literature, an increase in income and consumption inequality over the life cycle of households in Portugal is identified. In the case of income, inequality decreases in the higher age groups after retirement age. Regarding the evolution of inequality in intergenerational terms, the data point to a decrease in consumption inequality across all cohorts under analysis. Specifically, when comparing the different generations when they were the same age, the recent cohorts systematically present lower consumption inequality. In the case of income, the trend of intergenerational decrease in inequality is only observed for cohorts born after the 1950s. The decrease in income and consumption inequality makes the Portuguese economy an especially interesting case study. In particular, the Portuguese economy contrasts with the US and the UK, characterized in the recent past by a significant increase in income inequality and, albeit to a lesser extent, consumption inequality (Blundell, 2014; Heathcote *et al.*, 2010).

The relationship between income and consumption inequality depends on the nature of shocks affecting household income and on the existence of income and consumption smoothing mechanisms. A thesis consistent with the decline in consumption inequality in Portugal is that the role of these smoothing mechanisms increased in recent decades. This paper explores evidence concerning three of these mechanisms: the public transfer system, the labour supply of the various household members, and household access to the credit market (Heathcote *et al.*, 2014; Blundell, 2014). The article provides evidence of a reinforced role of these mechanisms over the past two decades. However, the available data do not allow quantifying the contribution of each of these mechanisms, so this analysis is essentially descriptive in nature.

The remainder of the article is organized as follows. The following sections present the databases used and characterize the evolution of income and consumption inequality in Portugal over the last two decades. Next, a decomposition of inequality over the life cycle and across cohorts is presented. An interpretation of the results emphasizing the smoothing mechanisms of income and consumption precedes the conclusions of the article.

Data

The main source used in this article is the Household Budget Survey (HBS). This survey is held every five years by Statistics Portugal. The survey provides detailed information on household expenditure, which is used in the

calculation of private consumption weights, both for national accounts and for calculating the consumer price index. Additionally, it provides information on household income. This combination of income and expenditure information makes this survey an important source for analyzing inequality in Portugal. This article uses the microdata underlying the last 5 surveys, corresponding to the period from 1995 to 2015 (Statistics Portugal, 1997, 2002, 2008, 2012, 2017)¹.

Total income and expenditure of households correspond to the sum of the monetary and non-monetary components². Household monetary income includes labour and pension income, property and capital income, social transfers other than pensions and private transfers, and is net of income taxes and social contributions. Household monetary expenditure includes all purchases of goods and services. The surveys also include information on so-called non-monetary expenditure (which coincides with non-monetary income): self-consumption (self-produced goods), self-supply (goods and services consumed freely in households' firms), owner-occupied imputed rents (estimated value of house rent when the household owns the house or has free accommodation), payments and salaries received in kind.

To simplify the analysis, the expenditure data is assumed to refer to the calendar year corresponding to the largest collection period covered by each survey, even if the collection period does not exactly coincide with the calendar year. For example, in the case of HBS 2015/2016 it is assumed that expenditure data refer to the year 2015. In addition, income data in each survey refer to the calendar year prior to the collection period, which explains why the time reference for income data precedes the one of expenditure (for example, in the case of HBS 2015/2016, income refers to 2014).

In this article, expenditure and income data correspond to data per household and per equivalent adult. The calculation of the variables per equivalent adult is based on the modified OECD equivalence scale, which assigns a weight of 1.0 to the first adult in the household, 0.5 to the remaining adults and 0.3 to each child (individuals under the age of 14 are considered children of the household). The use of this equivalence scale aims to take into account the existence of economies of scale within households, so that the variables calculated per equivalent adult tend to represent a better measure of economic well-being. All aggregated data presented (unless explicitly stated otherwise) refer to households in the population as a whole, corresponding

1. The latest wave of this survey, from 2015/2016, features data collected between March 2015 and March 2016 from a sample representative of households living in Portugal. The statistical results of this survey, as well as the methodology and questionnaires, are available from Statistics Portugal (2017). The number of households responding to the 2015/16 survey was 11,398, involving 26,889 individuals.

2. The households' total expenditure concept in this survey is close to that of households' final consumption expenditure of the national accounts. In similar way, total income concept is close to the one of household disposable in national accounts framework.

to extrapolated data based on a sample weight attributed to each household. In addition, expenditure and income data, in particular average and median values, are presented in real terms, using the consumer price index as deflator³ and 2015 as the price reference year.

The survey database also includes some variables that characterize households and the respective individuals. The households' characteristics (age group, year of birth, education level) are assumed to be the characteristics of the reference person in the household⁴.

Trends in income and consumption inequality in Portugal

In this section, we present evidence on the evolution of income and expenditure inequality in Portugal over the last two decades. Table 1 presents, besides the average and median values, some indicators related to the distribution of income and expenditure, which allow the analysis of the evolution of inequality between 1995 and 2015. These measures are presented for both monetary and total aggregates⁵.

One of the most widely used inequality indicators in the literature is the Gini coefficient, which synthesizes the asymmetry of the whole distribution and can take values between 0 (when all households have the same income or expenditure value) and 1 (when expenditure or income is concentrated in a single household). Other measures, such as percentile ratios, are based on comparing values at different points in the distribution and, in particular, between the distribution's extremes. For example, the p90/p10 ratio is the ratio between the 90th percentile value and the 10th percentile value of a given distribution and the p90/p50 ratio is the ratio of the 90th percentile value over the distribution median. In turn, the S90/S10 ratio is the ratio between the share of the 10% of households with the highest values and the share of the 10% of households with the lowest values for each variable. Taking the Gini coefficient as a reference, Figure 1 summarizes the evolution of monetary income and monetary expenditure inequality in the period under review. From Table 1 and Figure 1, several relevant facts can be highlighted.

In the case of expenditure, there is a significant decrease in inequality over the period under review. For example, for monetary expenditure, the

3. As a simplification, all aggregates were deflated using the total national consumer price index, not considering details by region and product.

4. The household reference person is typically the individual with the greatest proportion of total net annual income in the household.

5. Given the objective of integrating life-cycle and cohort analysis over time, this article has not considered households whose reference person is under 25 years of age or over 74 years of age. Results for inequality indicators calculated on the basis of total households would be very similar.

	Monetary income					Monetary expenditure				
	1994	1999	2004	2009	2014	1995	2000	2005	2010	2015
Mean (euros)	9504	11241	12099	12423	11179	8248	9112	8783	10196	9258
Median (euros)	7546	8710	9215	9624	8709	6234	6992	7065	8102	7606
p90/p10	5.0	5.4	5.3	5.0	5.0	7.2	6.5	5.6	5.8	4.6
p90/p50	2.3	2.4	2.5	2.4	2.3	2.6	2.6	2.4	2.4	2.2
p50/p10	2.2	2.2	2.1	2.1	2.2	2.7	2.5	2.4	2.4	2.1
S90/S10	10.2	11.4	11.6	10.2	11.0	15.6	13.4	11.8	11.7	8.7
Gini coefficient	0.361	0.377	0.381	0.364	0.359	0.409	0.390	0.368	0.369	0.332

	Total income					Total expenditure				
	1994	1999	2004	2009	2014	1995	2000	2005	2010	2015
Mean (euros)	11104	13039	15032	15482	14470	9793	10859	11628	13212	12533
Median (euros)	8795	10294	11795	12482	11994	7518	8617	9587	10913	10695
p90/p10	4.8	4.9	4.5	4.2	4.1	6.4	5.5	4.4	4.5	3.8
p90/p50	2.3	2.3	2.3	2.2	2.1	2.6	2.4	2.2	2.2	2.0
p50/p10	2.1	2.1	2.0	1.9	2.0	2.5	2.3	2.0	2.1	1.9
S90/S10	9.6	9.7	9.2	8.1	8.2	13.1	11.0	8.5	8.3	6.7
Gini coefficient	0.354	0.358	0.350	0.331	0.322	0.390	0.364	0.330	0.328	0.296

TABLE 1. Inequality measures of household income and expenditure in Portugal: 1995-2015

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: Calculations include households whose reference person age is between 25 and 74 years old.

Gini coefficient decreased from 0.409 in 1995 to 0.332 in 2015. The percentile ratios suggest that this reduction in inequality occurred in both the upper and lower tails of the distribution. This development contrasts with that observed in the case of income inequality, particularly in the case of monetary income inequality, which has an initially rising and then decreasing profile over the two decades⁶. This profile results from the evolution of inequality in the upper tail of the distribution. The path of income inequality calculated on the basis of the HBS is in line with the one computed with the Statistics Portugal's Survey on Income and Living Conditions (SILC), although the level of inequality in the HBS is slightly higher than the one found with EU-SILC (Rodrigues *et al.*, 2016; Statistics Portugal, 2017).

The decrease in income and consumption inequality contrasts with the evidence commonly analyzed in the literature, namely in the case of the US. However, evidence available to EU countries suggests that this decline in income and consumption inequality is a phenomenon observed in several

6. Between 2009 e 2014, the slight increase in the S90/S10 ratio is associated with a further fall in lower incomes during the crisis period, in a context of rising unemployment (Banco de Portugal, 2018).

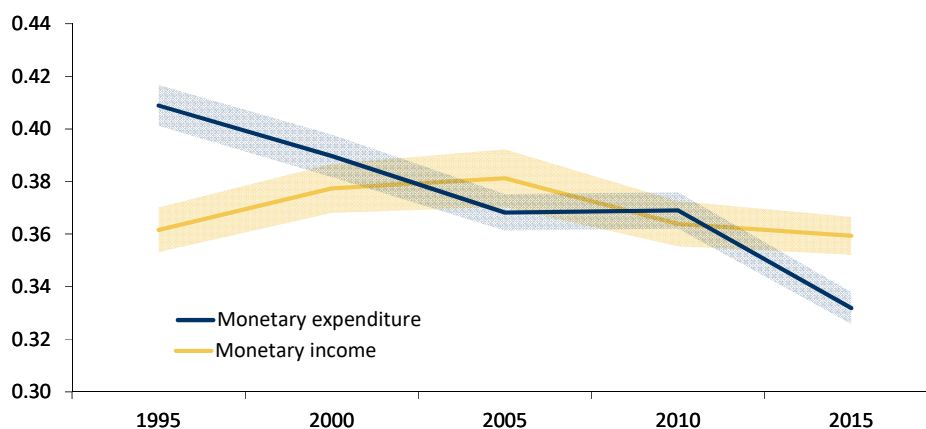


FIGURE 1: Income and expenditure Gini coefficients in Portugal

Sources: Statistics Portugal (HBS) and authors' calculations.

Notes: The reference period for income corresponds to the year preceding that of expenditure (year shown in the figure). Shading represents the 90% confidence intervals calculated with the `svylorenz` command in STATA (Jenkins, 2015). Calculations include households whose reference person is in the 25-74 age group.

countries⁷. At the end of the period under review, and in terms of international comparison, income and consumption inequality in Portugal ranked in the upper third of European Union countries.

The results in Table 1 show that non-monetary components contribute to reduce income and expenditure inequality between households⁸. However, the evolution over time is broadly similar whether monetary or total aggregates are used. Focusing on the most recent data for 2015, the indicators suggest that expenditure inequality is lower than income inequality. This result may be justified by the existence of consumption smoothing mechanisms against income shocks (Deaton and Paxton, 1994; Blundell, 2014). However, at the beginning of the period under analysis (up to the 2000 survey), the evidence pointed to a higher level of inequality in the case of

7. For income statistics, see <https://ec.europa.eu/eurostat/data/database>. For consumption, see Eurostat's experimental statistics, available for the years 2010 and 2015, in <https://ec.europa.eu/eurostat/web/experimental-statistics/income-consumption-and-wealth>.

8. This result is not surprising since a key component of non-monetary expenditure and non-monetary income are the imputed rents associated with owner-occupied housing services, which are broadly consumed by households, particularly in Portugal where the weight of own housing is very high.

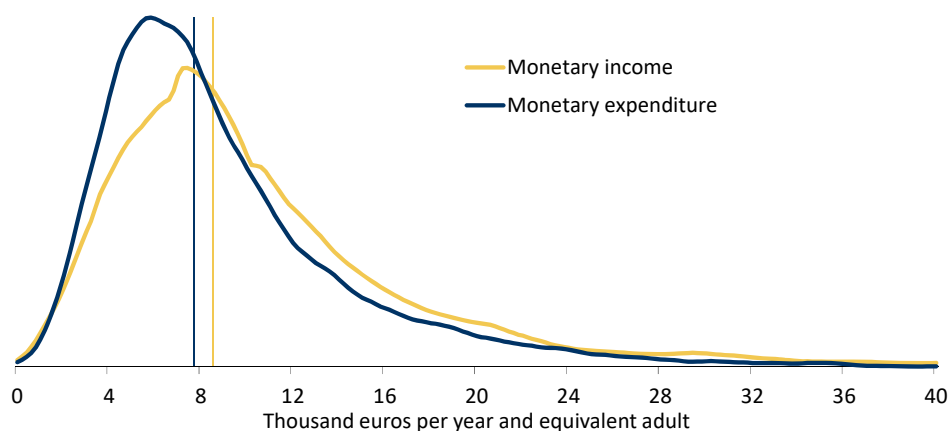


FIGURE 2: Density function of monetary income (in 2014) and monetary expenditure (in 2015) distributions

Sources: Statistics Portugal (HBS) and authors' calculations.

Notes: Kernel density estimation. The vertical lines correspond to the median of each of the distributions. Calculations include households whose reference person is in the 25-74 age group. The vertical lines indicate the median of each of the variables.

expenditure. This result is difficult to explain, but not unique in the literature (Blundell and Preston, 1998; Krueger *et al.*, 2010)⁹.

The remainder of the article will focus on the analysis of monetary aggregates, as usual in this literature, since non-monetary components are harder to quantify as they are not based on market prices.¹⁰

Figure 2 shows the distribution of household monetary expenditure and monetary income for the most recent data (HBS 2015). It can be seen that a large part of households are concentrated at low values in the distribution, both in the case of income and expenditure. Additionally, the distribution presents a very long right tail, implying that the mean distribution is significantly higher than the median (Table 1). A more detailed characterization of expenditure and income inequality in 2015 can be found in Banco de Portugal (2018), where indicators of inequality by age group, region, education level and income and expenditure deciles are presented.

9. In the case of Portugal, this result is also obtained in Gouveia and Tavares (1995), with data from the household budget survey for 1980 and 1990.

10. Note that the results would be qualitatively similar if total aggregates were used instead.

An analysis of inequality over the life cycle and across cohorts

Evidence on inequality by age and cohort

In an analysis of household income and consumption inequality, it is important to consider the role that some household characteristics and their evolution over time may play in driving aggregate outcomes. In particular, the population share in terms of household age is typically cited as a crucial factor in consumption and income behavior, both in terms of their average levels (Alexandre *et al.*, 2019) and in terms of inequality (Deaton and Paxton, 1994; Blundell and Preston, 1998). This is due to the accumulation of shocks over the household's life cycle. Examples of permanent income shocks may be a workplace promotion or a loss of income due to transitioning to long-term unemployment. The generational characteristics of households also play a crucial role. Individuals from different generations entered the labour market at different times and faced a distinct set of shocks, influencing their path over the life cycle. In this context, other characteristics, such as the degree of qualification of individuals, may also influence overall inequality.

The aggregate indicators presented in the previous section are based on cross-sectional information for several years. Aggregate developments over time thus mix the evolution of households of each generation (cohort) over time and the differences in the characteristics of the participants in each survey. One way to circumvent the fact that surveys do not contain a panel dimension is to construct a pseudo panel by combining cohort and age data by taking advantage of information on household characteristics in each survey (Deaton, 1997). This way it is possible to track cohorts over time.

The 5 surveys used in this article allow us to track each cohort for a maximum of 20 years. Cohorts and age groups were constructed as 5-year intervals, considering age groups between 25 and 74 years¹¹. Figures 3 and 4 show the Gini coefficients of monetary income and monetary expenditure for each cohort and by age group. This graphic analysis illustrates some traces of the inequality of different cohorts throughout the life cycle. An econometric analysis of this evidence will be presented in the following section.

Figure 3 shows an upward profile of monetary income inequality over the working life cycle and a reduction after retirement age (65 years onwards)¹². This result is in line with the literature, where the accumulation of shocks results in increased income and consumption inequality over the life cycle

11. Thus, the first age group is 25 to 29 years old and the last is 70 to 74 years old. In the case of cohorts, the first bracket (younger cohort) refers to generations born between 1986 and 1990 (only with observations in the 2015 survey) and the last to individuals born between 1921 to 1925 (only with observations in the 1995 survey).

12. For a similar analysis for expenditure and income averages by cohort and age, see Banco de Portugal (2018).

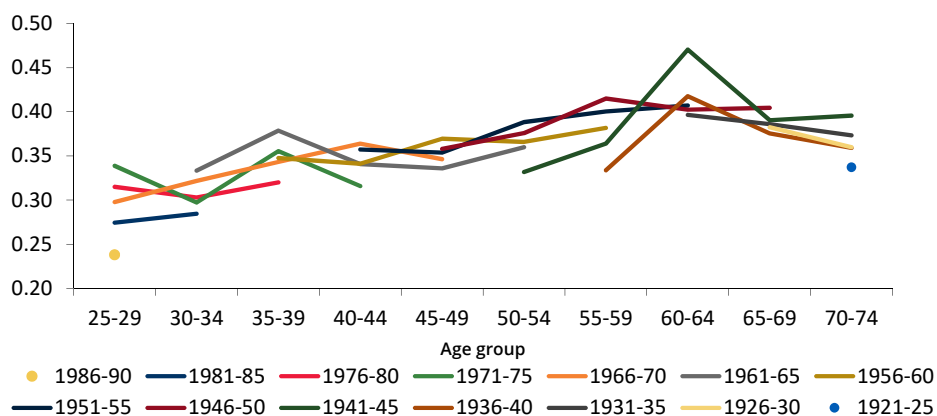


FIGURE 3: Gini coefficient of monetary income for each cohort by age group

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: Age groups and cohorts were defined at 5-year intervals, as described in footnote 11.

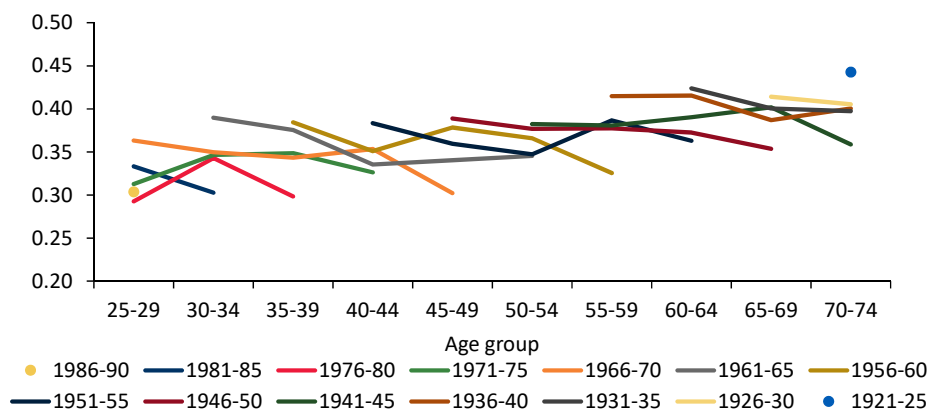


FIGURE 4: Gini coefficient of monetary expenditure for each cohort by age group

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: Age groups and cohorts were defined at 5-year intervals, as described in footnote 11.

(Deaton and Paxton, 1994; Aguiar and Hurst, 2013). Regarding the values of inequality across cohorts, the figure does not show a clear pattern of change across the different generations when they were the same age.

The graphical analysis of monetary expenditure inequality (Figure 4) is different from that of monetary income. On the one hand, inequality through

the life cycle does not depict a clear pattern, since the Gini coefficient for each cohort sometimes has a generally downward path across surveys. On the other hand, comparative results across cohorts seem to suggest that younger cohorts have lower expenditure inequality than previous cohorts at the same age.

It is important to highlight that this analysis only allows a partial and limited view of these age and cohort effects, especially as these characteristics interact with others, including the time dimension. Since the pseudo panel tracks cohorts across various editions of the HBS, observations may be affected by survey-specific effects, such as measurement errors. At the same time, the observations of a given cohort in various surveys may represent different households of that group with very different characteristics.

One of the structural features that changed over time in Portugal was the educational level, reflecting the fact that younger cohorts gradually show higher levels of education than previous cohorts. In Banco de Portugal (2018), information on Gini coefficients by educational groups (considering only 2 levels of educational attainment) suggests a positive association between educational level and income inequality in the last two decades¹³. Additionally, with regard to monetary expenditure, there is no apparent relationship between educational attainment and inequality in the last two decades. Increased workforce education thus may have contributed to an increase in income inequality. Given the evidence in Figure 1, other factors may have contributed in the opposite direction, which will be explored in the next section of the article.

Estimation of life cycle and cohort effects

As noted above, life cycle and cohort effects are important dimensions in understanding the aggregate evolution of inequality. However, the calculation of inequality measures by cohort and age brackets does not fully isolate these effects, as it is not possible to observe the different cohorts in each age bracket at the same time.

In this section, econometric techniques are used to estimate age and cohort effects on income and monetary expenditure inequality, isolating them from the time effect (year of the survey). The estimation is based on the pseudo panel data described in the previous section. The time effect includes, for example, cyclical factors affecting the economic situation or specific characteristics of the survey in a given year. The cohort effect includes factors such as the different levels of access to education, the specific conditions experienced by each cohort upon entering the labour market, technological

13. A positive relationship between average levels of education and wage inequality in Portugal is also suggested in Machado and Mata (2005), although for an earlier period (1986-1995).

progress or other shocks that have affected the households of a given generation differently from the others. Age effects include factors related to the life cycle of households, such as the accumulation of shocks in the labour market and the impact of retirement on income and consumption inequality.

The main difficulty in isolating and estimating these effects results from the fact that the variables cohort, age and time / year of survey are perfectly collinear (year of birth = year of survey – age). Thus, the estimation of these effects requires imposing restrictions. In this article, the approach proposed in Heathcore *et al.* (2005) was followed. The estimation uses dummies related to the variables age, cohort and time, to estimate the effects of these 3 variables by pseudo-panel regressions, controlling by pairs of variables. Age dummies were used for all but one reference bracket (in this case the age group of 30-34 years¹⁴). In the same way, dummies were constructed for the variables related to time (survey year) and cohort (year of birth). In the latter case the reference group corresponds to the generation born between 1921 and 1925.

The approach of Heathcore *et al.* (2005) proposes that effects can be estimated based on the following set of regressions:

$$Var(y_{a,c,t}) = \beta_0^1 + \beta_a^1 D_a + \beta_t^1 D_t + \varepsilon_{a,c,t}^1 \quad (1)$$

$$Var(y_{a,c,t}) = \beta_0^2 + \beta_a^2 D_a + \beta_c^2 D_c + \varepsilon_{a,c,t}^2 \quad (2)$$

$$Var(y_{a,c,t}) = \beta_0^3 + \beta_c^3 D_c + \beta_t^3 D_t + \varepsilon_{a,c,t}^3 \quad (3)$$

where $Var(y_{a,c,t})$ is the variance of the logarithm of the variable¹⁵ (income or expenditure) for the group of households whose reference person belongs to the age group a and cohort c (observed in the period $t = c + a$). D_a and D_c , are vectors that correspond, respectively, to the sets of dummies for the age and cohort, and D_t includes the dummies for the survey year.

Thus, the effect of the life cycle (age) can be estimated alternatively using equation 1, i.e. assuming the existence of time effects and abstracting from the effects of cohort, or equation 2, i.e. assuming cohort effects but abstracting from time effects, since it is not possible to consider the 3 dimensions simultaneously in the same equation.

Equivalently, cohort effects on inequality can be estimated by controlling for age (equation 2) or, alternatively, controlling for the year of the survey (equation 3). It should be noted that the results are sensitive to the hypotheses adopted, as in Heathcore *et al.* (2005).

For the selection of regressions, we consider that it would be crucial to control for the time effect, as the sample includes a limited number of

14. For estimation purposes, the age group of 25 to 29 years was excluded, as this age group typically has significantly fewer observations than the others in each survey. However, results with and without this age group are qualitatively similar.

15. The results of this analysis are robust to the use of other inequality measures, such as the Gini coefficient, the coefficient of variation or percentile ratios.

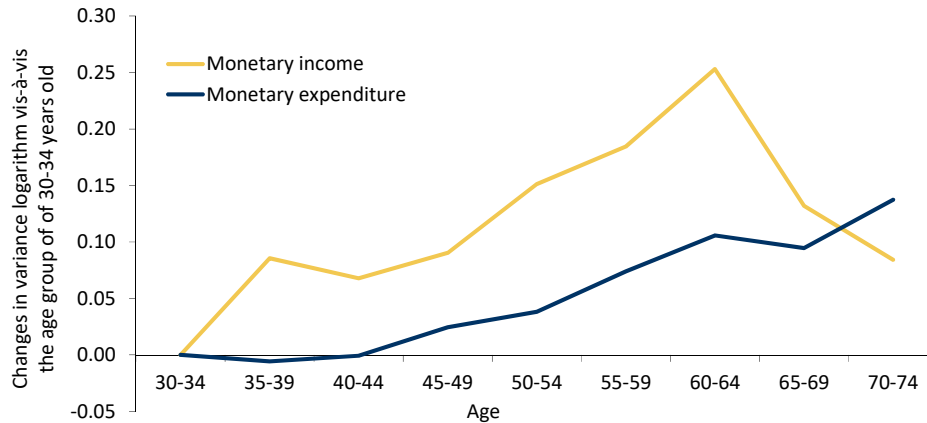


FIGURE 5: Life-cycle effects on income and expenditure inequality (variance of logarithms)

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: The figure represents, for each age group, the difference in the household income and monetary expenditure variance of logarithms relative to the reference age group (30-34 years).

surveys. Thus, estimates for the life cycle effect come from the regression of the variance of logarithm (of income or expenditure) in the age dummy and the time dummy corresponding to the survey year (equation 1) and the estimates for the cohort effect come from the regression of the same variables in the cohort and time dummies (equation 3). In both regressions the estimates for the survey year dummies coefficients are quantitatively similar. The estimated effects relate to the age or cohort reference groups indicated above (30-34 years and 1921-1925, respectively).

Based on this methodology, the set of estimated coefficients β_a^1 represents the life cycle effect on income and consumption inequality. These coefficients are presented in Figure 5. The dummy coefficient for each age group measures the estimate of the difference in inequality (measured by the income or expenditure variance of logarithms) for that age group relative to the 30-34 years group.

The results suggest that household income and expenditure inequality increases over the life cycle. This result is in line with that suggested in the literature (Blundell, 2014; Deaton and Paxton, 1994). According to life cycle theory, consumption varies over life as a function of permanent income. The accumulation of permanent shocks will tend to be reflected in an increase in income inequality over the life cycle, with expenditure presenting a smoother profile. It should be noted that estimates suggest that around retirement age income inequality starts declining, which is not the case for consumption.

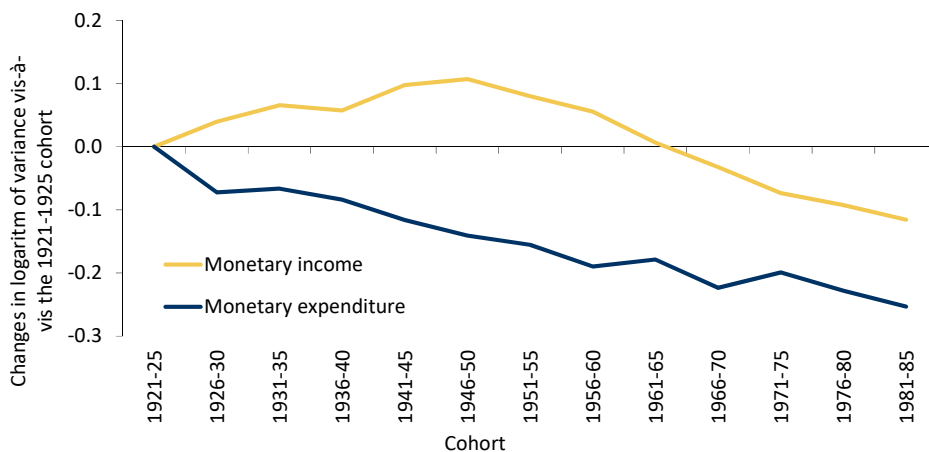


FIGURE 6: Cohort effects on income and expenditure inequality (variance of logarithms)

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: The figure represents, for each cohort, the difference in household income and monetary expenditure variance of logarithms relative to the reference cohort (generation born between 1921 and 1925).

Regarding the cohort evidence, Figure 6 presents the estimated coefficients β_c^3 for the variance of income and expenditure of the various cohorts compared to the cohort between 1921 and 1925.

The figure shows a marked reduction in monetary income inequality for generations born after the 1950s. In the case of monetary expenditure, a reduction in inequality is estimated over all successive generations. This result is different from that documented in the literature for the United States and the United Kingdom (Blundell, 2014)¹⁶.

16. These life cycle and cohort effects were also estimated with an alternative methodology, inspired by Aguiar and Hurst (2013). The authors propose a normalization of the time variable (survey year) to allow the simultaneous inclusion of the three dimensions in the estimation. This transformation, originally proposed by Deaton (1997), assumes that the effects of time are orthogonal to a trend and average zero after normalization, bypassing the collinearity limitation. The methodology of Aguiar and Hurst (2013) has two steps. In a first step, the same regression estimates the life cycle, cohort and time effects on the averages of the expenditure or income variable. Next, cohort and life cycle effects on inequality are estimated through a regression for the variance of the residuals from the previous step. The coefficients obtained with this methodology are qualitatively similar to those presented in this article.

The strengthening of income and consumption smoothing mechanisms

In order to understand the potential causes underlying the decrease in inequality across cohorts reported above, it is useful to refer to the analytical framework presented in Blundell *et al.* (2008). These authors state that the empirical relationship between the evolution of consumption distribution and the evolution of income distribution depends on the degree of persistence of income shocks, on the income smoothing mechanisms and on the degree of “insurance” (smoothing) of consumption vis-à-vis changes in income. As regards the degree of persistence of shocks, it is well known that income shocks are only partially transmitted to consumption. This transmission will be larger (smaller) the more persistent (the more transitory) the income shock is. With regard to household smoothing and risk-sharing mechanisms, the literature emphasizes the role of wealth and savings, tax progressivity, public transfers, intra-family transfers, informal safety nets and access to credit market (Heathcote *et al.*, 2010).

Given this analytical framework, there are several possible interpretations that reconcile the evidence on the evolution of income and consumption inequality in Portugal¹⁷.

One possibility is anchored in the nature of the shocks that affected household income over this period. According to this thesis, the fall in consumption inequality could be rationalized with a lower incidence of permanent shocks on income over the period under review. The slight increase in income inequality in the first decade under review could also be justified by an increase in temporary income shocks, by nature more likely to be smoothed out in agents’ consumption decisions. Examples of these temporary shocks are one-off increases in overtime work or a sick leave. In order to test this hypothesis, it would be necessary to have a panel database tracking households over time (Blundell *et al.*, 2008). Thus, it is not possible to analyze this issue with the information available in the HBS sectional data.

A second possibility is that the smoothing mechanisms available to households have increased over these two decades. It should be noted that this thesis can perfectly coexist with the above thesis that the persistence of income shocks changed over this period. Once again, it is not possible to estimate with HBS the structural evolution of the role of these mechanisms in the Portuguese economy. Nevertheless, evidence from HBS can be combined with other statistical sources to characterize the impact of some of these smoothing mechanisms over time. The descriptive analysis below focuses on three “insurance” mechanisms that the literature identifies as central: (i) the public transfer system, (ii) the labour supply of the various household

17. One possibility would be to simply consider that measurement errors underlying each survey had varied substantially and monotonically over time. This hypothesis does not seem plausible and thus will not be explored here.

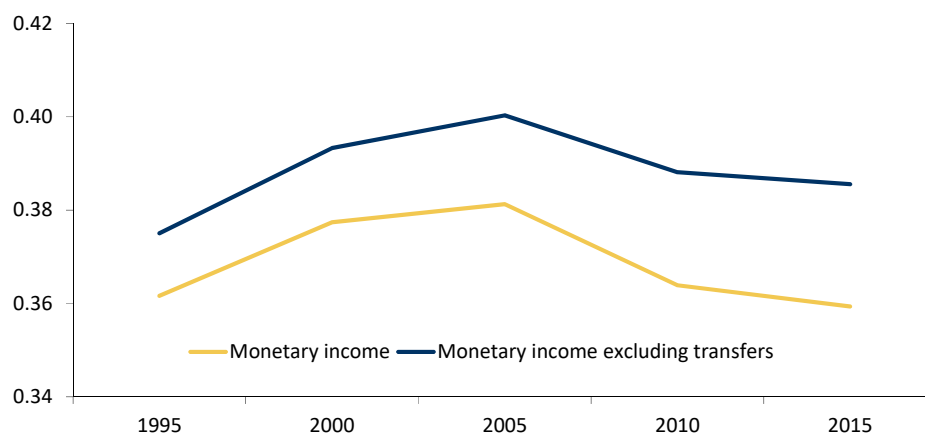


FIGURE 7: Impact of public transfers (excluding pensions) on inequality: Gini coefficients

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: Public transfers (excluding pensions) include social transfers in support of household, housing, unemployment, sickness and disability, education and training and social inclusion.

members, and *(iii)* household access to the credit market. While the first two mechanisms directly affect income inequality and hence consumption, the latter mechanism directly contributes to the smoothing of consumption in the face of temporary income shocks. In order to reconcile the reduction of inequality - especially of consumption - with the functioning of these smoothing mechanisms, their role needs to have increased over the period under review.

The public transfer system to households

The public transfer system (excluding pensions) contributes to reduce inequality in all economies. In Portugal, between 1995 and 2015, the share of cash transfers in household disposable income increased from about 3.5 per cent to about 5.0 per cent. In turn, the share of transfers in kind increased from about 2.0 to about 2.5 per cent of household disposable income over the same period.

The impact of the increase in public transfers (excluding pensions) on income inequality can be illustrated on the basis of the HBS. Chart 7 shows that the role of social transfers in decreasing income inequality has increased substantially over the past two decades. This result is consistent with their increasing share of household disposable income. Chart 8 shows that the increase in this redistributive role was concentrated on working age

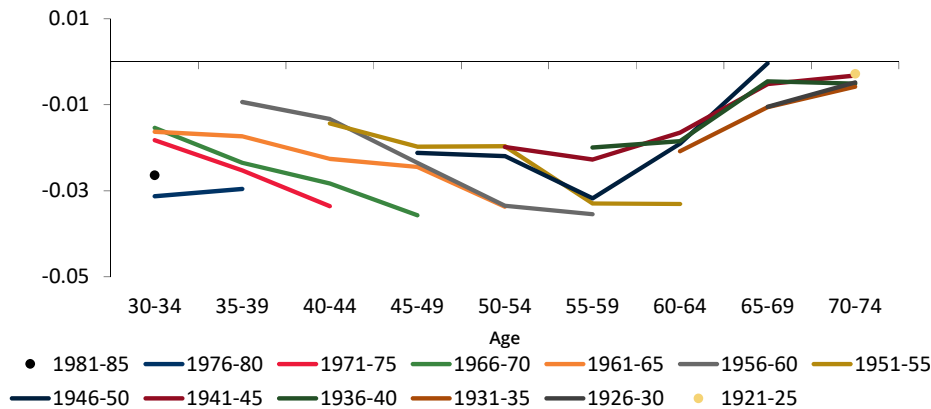


FIGURE 8: Difference between Gini coefficients of monetary income and of monetary income excluding transfers, for each cohort by age group

Sources: Statistics Portugal (HBS) and authors' calculations.

Note: Negative values indicate that the monetary income Gini coefficient is lower than the monetary income Gini coefficient excluding public transfers (excluding pensions) include social transfers in support of household, housing, unemployment, sickness and disability, education and training and social inclusion.

households. In addition, the effect of these transfers appears to be more pronounced in younger cohorts (compared to previous cohorts when they were the same age).

Household labour supply

A higher participation of household members in the labour market typically contributes to reducing income inequality and, as a consequence, consumption inequality. The fact that more than one household member participates in the labour market decreases income inequality between households especially when individual incomes are not closely correlated among household members. For example, in the face of idiosyncratic labour market shocks that affect one individual, other family members can offset part of the shock through increased labour market participation (Alves and Martins, 2015). In the HBS data, the inequality of household labour income (plus pensions) is lower than the inequality of labour income (plus pensions) calculated at the individual level (Chart 9)¹⁸. This conclusion is the same for

18. These results were obtained applying the OECD equivalence scale to the households and to the respective individuals. The conclusions would be similar without the equalization of incomes.

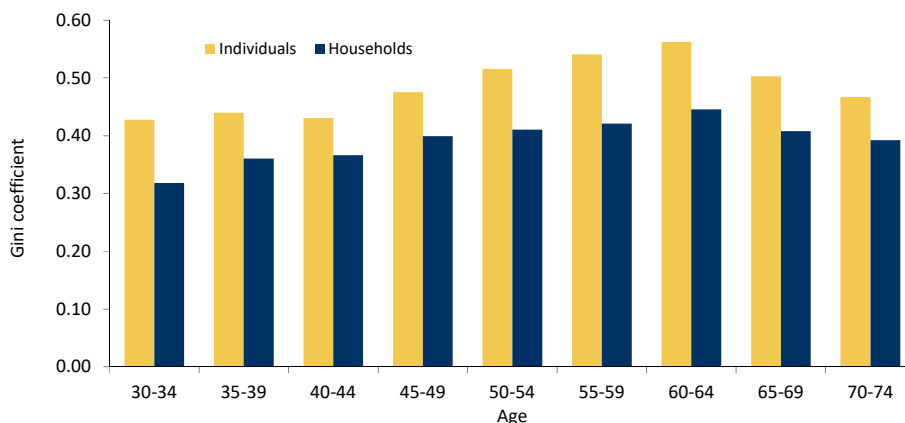


FIGURE 9: Gini coefficient of income from labour and pensions in 2015

Sources: Statistics Portugal (HBS) and authors' calculations.

Notes: For each age group the Gini coefficient of individual and household income in 2015 (including zero incomes) was calculated. In the individual income calculations, each individual was included in the age bracket corresponding to the age of his household reference person. Household income corresponds to the aggregation of individual incomes. All calculations include individuals aged 25-74.

all age groups¹⁹. This suggests that the aggregation of individual incomes at the household level contributes to reducing inequality in Portugal.

In this context, a striking fact of the Portuguese economy in recent decades is the increasing participation of women in the labour market (Banco de Portugal, 2019). Between 1998 and 2015, the female participation rate (15-64 years) in the labour market increased from about 62 per cent to about 70 per cent. Together with the evidence from Chart 9, it is plausible that this higher female participation contributed to reducing household income inequality in Portugal. However, this is a tentative and partial equilibrium conclusion (for general equilibrium analyzes, see Heathcote *et al.*, 2017; Blundell *et al.*, 2016).

Credit market participation

An important source of consumption smoothing against temporary income shocks comes from credit market participation. In fact, access to credit markets allows smoothing out situations in which temporary income shocks make household liquidity constraints binding (Blundell, 2014). These constraints are

19. Due to lack of data on individual incomes, it is not possible to replicate these computations to the HBS surveys before 2010, which prevents an intertemporal analysis of this issue.

particularly binding in lower-income households but may also arise in high-income households (Kaplan *et al.*, 2014). Over the past two decades, household participation in the credit market has increased substantially in Portugal for all income brackets (Table 2)²⁰. This increase was also observed for all age groups. This conclusion is robust whether considering access to any type of credit or just non-mortgage credit. In this period the increased participation in the credit market may have thus contributed to reducing consumption inequality in Portugal by allowing consumption decisions to be smoothed out in the face of temporary income shocks.

Income percentiles	% of households holding debt		% of households holding non-mortgage debt	
	1994	2013	1994	2013
≤ 10	9.3	36.6	4.7	17.9
10-25	15.8	45.7	5.9	21.4
25-50	21.8	54.8	7.6	25.9
50-75	33.6	69.3	11.4	31.0
75-90	40.8	75.6	15.5	28.5
> 90	35.1	78.0	14.0	25.6
Total	26.7	60.7	9.8	26.1

TABLE 2. Credit market participation

Sources: Households' Wealth and Indebtedness Survey (1994) and Portuguese Household Finance and Consumption Survey (2013).

Note: Calculations for households whose reference person is younger than 65 years old.

Conclusions

This paper sought to characterize the evolution of household income and expenditure inequality in Portugal in the period 1995-2015. Based on a pseudo panel, the role of the life cycle in household inequality and the evolution of this inequality across cohorts was estimated. A striking feature in the Portuguese economy is the decrease in consumption inequality in successive cohorts. The article suggests that the strengthening of income and consumption smoothing mechanisms in the Portuguese economy may have contributed to this evolution.

20. The authors thank Sónia Costa and Luísa Farinha for the computations underlying Table 2.

This article opens avenues to several studies on the estimation and study of the factors underlying the evolution of income and consumption inequality in Portugal. These structural factors also provide insights on future developments of inequality. These include the ageing population, the increasing participation of women in the labour market, improved educational attainment of individuals and the potential reinforcement of insurance networks available to households. The joint modeling of these elements is a demanding challenge for future research.

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