ORIGINAL ARTICLE

Income, consumption and wealth inequality in Spain

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Abstract

This paper analyses the level of inequality in Spain and how it evolved over the course of the past crisis and the early stages of the current recovery. To this end, it first introduces the various dimensions of wage, income, consumption and wealth inequality, and studies how they have developed. The analysis shows less wage dispersion in Spain than in other comparable economies, even after the crisis years, while the surge in unemployment during the period resulted in a high level of inequality in per capita income. The level of inequality in Spain is more moderate when total gross household income is analysed, decreasing during the crisis as a result of pensions developing more favourably than other sources of income, in conjunction with young people delaying setting up home. Inequality in per capita consumption rose during the crisis, particularly as a result of a decrease in expenditure on consumer durables by low-income households. Wealth inequality exceeds income inequality and increased during the downturn as a result of financial assets outperforming real assets. Nevertheless, Spain's wealth inequality is moderate by international standards, as ownership of real assets is more widespread than in other countries. The way inequality has evolved during the early stages of the current economic recovery shows that falling unemployment has enabled a reduction in wage income inequality, as well as in per capita income inequality, albeit to a lesser extent.

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1 Introduction

Since the onset of the crisis, income inequality has increased in many OECD countries, including Spain. In fact, this has been a focal point of academic analysis in the past few decades and, more recently, has appeared on the agendas of various national authorities and international organizations.

Unlike other advanced economies, Spain has not witnessed a sustained rise in inequality in earnings, income or wealth over recent decades. In particular, when wage income, household income and wealth are studied over the period from the mid-1980s to 2008 a decrease in inequality is even apparent.[1] However, the evolution in earnings and income inequality in Spain is highly countercyclical. Particularly in the lower part of the distribution, earnings and income dropped considerably during downturns and rose during economic booms.[2]

This paper analyses the level of inequality in Spain and how it evolved mainly over the course of the past crisis. First, it introduces and links the concept of inequality in different dimensions: wage, income, consumption and wealth inequality in Spain (see Appendix 1 for a detailed description). Analyzing different dimensions of inequality is important to understand the functioning of various insurance mechanisms available to individuals and households linking the abovementioned concepts as suggested in Blundell (2011). The motivation of this latter paper was the notable increase in income and consumption inequality in the United States and the United Kingdom during the last 40 years. Instead, our motivation is the relatively high level of income per capita inequality in Spain compared to other countries and the notable increase of income and wealth inequality in Spain during the last recession. Our results suggest that the high level of inequality in terms of gross income per capita in Spain compared to other countries is related to the high incidence of unemployment and the relatively low level of effective hours worked while occupied among those individuals with low earning potential. On the contrary, hourly wage differentials are not particularly high in international standards. Moreover, despite having a progressive tax system, Spanish direct taxes do not change the international ranking of Spain when comparing gross and net income per capita inequality. As expected, consumption inequality is lower

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[1] Goerlich and Mas (1999) document a decrease in inequality in household and per capita incomes in Spain between the mid-1970s and the early 1990 s based on data from the Household Expenditure Survey (EPF), while Pijoan and Sánchez-Marcos (2010) confirm a drop in inequality in earnings and household incomes between 1985 and 2000, based on EPF data and the EU households panel. For their part Bonhomme and Hospido (2017) analyse the drop in inequality in earned income between 1988 and 2007, while Arellano and Bover (2013) find a slight increase in household income inequality between 2000 and 2008 at the bottom end of the distribution and a decrease at the top end. Stability in terms of wealth has been documented in Martínez Toledano (2017).

[2] See Pijoan and Sánchez-Marcos (2010), Izquierdo and Lacuesta (2012), Carrasco et al. (2015) and Bonhomme and Hospido (2017).

than income inequality. Interestingly, following the approach in Basso et al. (2017) and Arellano et al. (2017), we find that this fact partly reflects the high mobility of income at the two tails of the distribution. Finally, unsurprisingly, wealth inequality greatly exceeds income inequality. The abovementioned income dynamics partly explains this fact via the greater accumulation of wealth by high income households since wealth accumulates year after year. However, when looking at the asset portfolio of different segments of the population, it is also clear that wealth inequality cannot be explained only by different saving behavior but also from differences in the returns of the different assets in the households' portfolio by wealth decile. The fact that in Spain real estate asset holdings are substantial even in the portfolio of richer households makes Spanish wealth inequality relatively low in international standards. In this regard, we confirm that the bias towards homeownership is a factor leading to lower wealth inequality as in Kaas et al. (2017) and Kindermann and Kohls (2016).

Second, our paper presents an analysis of how inequality evolved during the crisis in Spain. Similarly to Blundell (2011) we contribute to the literature of how households were able to insure themselves against the big financial crisis and how those mechanisms varied by age and wealth. One particularly interesting result is that the crisis affected individual labour earnings inequality by changing the effective hours worked of particular segments of the population (youth and low skilled) instead of their relative hourly wages. This is consistent with the evidence in other European countries that most of the adjustment was done in a context of nominal wage rigidities (Babecký et al. 2012). This fact, coupled with the increase in unemployment affecting mostly youth, low tenured and low skilled, disproportionately increased inequality in income per capita. The paper shows that some households changed their living arrangements to partially insure the shock. In particular, the paper presents some evidence that low income households decreased their fertility rates [as in Adsera (2011) and Barceló and Villanueva (2018)] and that children in unemployment delayed their emancipation from their parental household as in Kaplan (2012). We also find a second earner effect increasing the household labour supply as in Ortigueira and Siassi (2013). However, it does not appear to be effective since the high assortative mating results in characteristics of both partners in a couple to be similar, reducing the effectiveness of that search for new jobs [as in Dolado et al. (2017)]. As in Blundell (2011) we show that public transfers were important to cushion the income negative shock. On the one hand, earnings coming from the unemployment subsidy disproportionately enter in the low end of the income per capita distribution. On the other hand, pensions, that are countercyclical, were important to maintain the income at the low end of the total income distribution. The government also increased the proportionality of direct taxes but the effect of this measure on inequality appears to be very low. In terms of consumption, we find, as in Blundell (2011) that the biggest changes were in durable goods for households with lower per capita consumption. Moreover, wealthiest households were better able to maintain their level of consumption in the face of falling income up to a certain age. Indeed, in those households headed by a person over 55, wealth barely plays an important stabilizing role. Finally, the paper documents that wealth inequality grew significantly during the crisis. This seems to be related to the important drop in the average value of real assets (more concentrated in the lower part of the income distribution) as in Wolff (2018).

The paper is organized as follows. Section 2 describes the different data sets that are used for the analysis. Section 3 discusses the findings regarding inequality in 2014 in terms of wage income, household income, consumption and wealth. In Sect. 4 the evolution of inequality in all of these dimensions over the last recession period is described, whereas in Sect. 5 a brief account of the evolution of inequality during the recent expansionary period is provided. Finally, Sect. 6 concludes.

2 Data

We use several datasets. Appendix 2 briefly presents the characteristics of the data used and how the main variables of interest have been constructed. The main data source is the Survey of Household Finances (EFF), conducted by the Banco de España, which provides information on wages, income, consumption and wealth. One limitation, however, is that the data set concludes in 2014.

Despite the fact that the EFF allows researchers to do both an analysis at the individual and the household level, when analysing individual earnings, the paper extensively uses the microdata of the Spanish Structure of Earnings Survey (EES). This is the case because EES has more precise information on the effective hours worked allowing for a better estimation of hourly wage per worker. Note, however, that EES and EFF have sampling differences that are important for the interpretation of inequality figures. In particular, individual income inequality is much higher in the EFF than in the EES for the same year, especially during the crisis. This is the case mainly because the EFF sample is representative of all the population (including persons who are employed, unemployed and inactive at the time of the survey), whereas the EES data refer only to persons who have been working throughout the month of October of the year of reference. One advantage of using the EFF and the EES is that for both of them there exists a comparable European dataset. In the case of individual earnings, the information available refers to the European Structure of Earnings Survey (ESES) released by Eurostat, the design of which is similar to the Spanish survey. In the case of household income, consumption and wealth we use the European Household Finance and Consumption Survey[3] (HFCS).

In Appendix 3 we present robustness results for the period 2008–2014, both for the cross section and the longitudinal analysis, using different data sets. In particular, the paper uses the annual Spanish Labour Force Survey (EPA) wage data, converted to monthly frequency, for full-time employees; the monthly wages of workers working the whole week in the fiscal module of the Continuous Sample of Working Histories (MCVL) conducted by the Ministry of Employment and Social Security; and the European Union Statistics on Income and Living Conditions (EU-SILC) dataset, published by Eurostat, that allows a comparison of total and per capita income across different EU members, in both net and gross terms.

Finally, in order to cover the evolution of inequality during the early years of the recovery (specifically between 2014 and 2017), Sect. 5 uses EPA and EU-SILC

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[3] See Household Finance and Consumption Network.

to update the information on inequality in individual wage income and household income.

3 Relationship between income, consumption and wealth inequality in Spain in 2014

This section analyses inequality in Spain in terms of hourly wages, wage income, household income, consumption and wealth.[4] In particular, it examines in depth the economic decisions and economic policy instruments that generally imply that inequality is lower when compared in terms of income and consumption and higher when the focus is on wealth.

Inequality analysis can focus on different variables that are closely interconnected. For example, there are individual differences in hourly wages, in the ability to obtain income other than labour income, in access to public goods or in decisions on household formation, consumption and saving. In general, all these measures are related. For instance, workers' wage income is a function of their hourly wage and of the number of hours they work over a specific period.

In the remaining of this section, earnings' inequality across workers is analysed in Sect. 3.1, whereas Sect. 3.2 focuses on inequality across households. In turn, households' gross income depends first on the members of the household and how their time is organised between paid work, housework and leisure. Moreover, wage income is not the only component of household income, as in addition to income from paid employment there is income from self-employment and there are unemployment benefits, pensions and other transfers that serve as a form of social insurance in situations of hardship. The total sum of all these forms of income is not available for consumption, as a portion must be deducted for payment of taxes, giving net disposable income. Lastly, households themselves decide what portion of their net income they wish to consume, depending among other factors on the level of uncertainty underlying their future income expectations, their stage of life, their available wealth and the public or subsidised goods available to them. All income that households decide not to consume are savings; households' wealth will vary according to the assets in which they invest their savings, the price paid and the rate of return obtained.

3.1 Wage income inequality across workers

On average, the wage income of Spanish household members amounts to 60% of the household's total annual income, making it a prime candidate for analysis in the study of inequality. The inequality observed in this variable is analysed below, distinguishing between inequality stemming from differences in hourly wages and that stemming from differences in the number of hours worked.

In 2014 hourly wage inequality in Spain was similar to the median of the euro area countries. Drawing on information by Eurostat, in 2014 the hourly wage of workers

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[4] Note that this paper addresses inequality and not poverty, which is generally defined as the population that does not meet a specific income threshold (50% or 60% of median income).
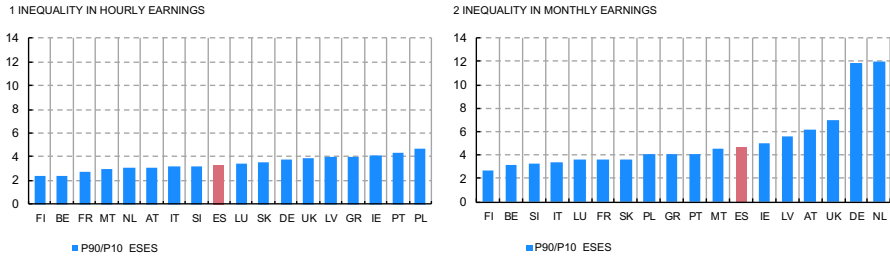
1 INEQUALITY IN HOURLY EARNINGS

2 INEQUALITY IN MONTHLY EARNINGS

Fig. 1 International comparison of inequality indicators. Wage earnings (2014). *Source*: Eurostat (European Structure of Earnings Survey - SES)

	Real hourly wage	Real monthly wage
Gini	0.28	0.35
P90/P10	3.27	5.59
P50/P10	1.55	2.54
P75/P25	1.87	2.18
P90/P50	2.11	2.20

Table 1 Wage earnings inequality indicators. *Source*: INE (EES)

in the ninth decile of the distribution in Spain was 3.3 times higher than that of those in the first decile. This inequality indicator (the P90/P10 ratio) was close to the median of the EU countries: below countries such as Portugal, Ireland, Germany or the United Kingdom, but above France, Belgium and the Nordic countries (see panel 1 of Fig. 1).

In the case of Spain, hourly wage differences were smaller at the low end of the distribution. As Table 1 shows, in 2014, while the P90/P10 ratio for hourly wages was 3.3, the P50/P10 ratio was just 1.6. At the high end of the distribution there were larger differences; specifically the P90/P50 ratio was 2.1.

There are important differences in demographic characteristics across the hourly wage distribution. A larger proportion of women, young people, workers with low levels of educational attainment and those with limited tenure are concentrated at the low end of the distribution. Specifically, panel 1 of Table 2 shows that in 2014 63% of workers with wages in the first decile of the wage distribution are women, although they account for 48% of all wage-earners. In turn, most of the workers in this first decile (62%) have no education beyond compulsory schooling, compared with 43% for all wage-earners. In addition, workers' age and tenure are higher in the higher deciles of the wage distribution. This is related to significant hourly wage differences in Spain by gender, age, level of educational attainment and tenure. Figure 2 presents the result of a regression model designed to separate the effect of each such variable on hourly wages. This analysis confirms significant negative wage differentials for women, young people, new hires and workers with lower levels of

Table 2 Characteristics of wage-earners in Spain by real hourly wage percentile (EES 2014). *Source:* National Statistics Institute

1 Demographics (a)

	% Women	Average age	Education level		Average years of tenure
			Compulsory (%)	Post-compulsory (%)	
P10	63.4	38.7	61.6	38.4	4.72
P25	61.1	39.2	61.3	38.7	5.11
P50	54.6	39.7	59.1	40.9	5.99
P75	50.8	40.5	52.3	47.7	7.35
P90	49.3	41.0	46.9	53.1	8.30
All	48.0	41.5	43.1	56.9	9.05

2 Contractual conditions

	% Part-time work	% Temporary contract	Hours worked, part-time	Hours worked, full-time	Hours worked, total	Days per month not worked (b)
Gender						
Female	36.5	21.2	92.26	168.17	140.49	11.54
Male	14.9	20.2	86.44	171.88	159.16	15.04
Age						
16–29	38.6	37.9	86.81	171.61	138.87	15.74
30–44	23.6	20.8	96.03	170.70	153.09	13.09
45–54	21.7	14.0	91.18	170.06	152.98	13.50
55–64	24.3	15.7	75.55	168.68	146.02	10.82
Over 64	43.6	19.1	66.65	169.03	124.42	5.79

Table 2 continued

2 Contractual conditions

	% Part-time work	% Temporary contract	Hours worked, part-time	Hours worked, full-time	Hours worked, total	Days per month not worked (b)
Length of tenure						
Less than 1 year	41.0	71.4	80.91	172.90	135.16	19.02
At least 1 year but less than 3 years	37.4	41.5	85.87	171.82	139.68	13.55
At least 3 years but less than 10 years	25.0	11.1	96.14	170.53	151.91	12.29
10 years or more	14.3	4.7	95.07	169.16	158.57	13.03
Education level						
Compulsory	31.6	23.7	89.21	172.70	146.30	12.82
Post-compulsory	20.4	18.5	91.96	168.84	153.16	13.27

a. Each row represents the characteristics of the population below the percentile concerned. For example, P10 refers to the characteristics of the population with wage income below the 10th percentile and P90 to the characteristics of all the population with wage income below the 90th percent ile. b. Days per month not worked calculated only for the sample of workers who have not worked the full month. It is the sum of two questions: 1. Were you off work due to illness, maternity or paternity leave, high-risk pregnancy leave or breast-feeding, unpaid leave or a redundancy programme? 2. Were you on strike at any time or temporarily laid off for reasons other than those indicated above?
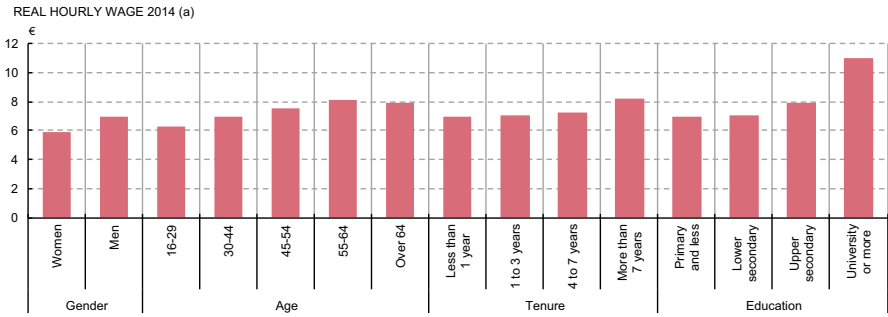
REAL HOURLY WAGE 2014 (a)

Fig. 2 Wage differentials by socioeconomic groups. a. The values reported in the graph are calculated in the following way: first, we estimate a Mincer regression of the logarithm of real hourly wages on dummy variables for gender, age, education, length of service, firm size, working hours and contract type, for the sample of all wage-earners. The omitted categories in the estimations are: man, age 30–44, primary education or less, tenure less than 1 year, firm size 10–49, part-time contract and temporary contract. Second, the estimated wages reported in the graph are calculated as the exponential of the sum of the coefficient of each of the corresponding dummy variables and the constant term. *Sources*: INE (EES) and Banco de España

educational attainment.[5] However, the evidence available suggests that hourly wage differentials between groups are not particularly high compared with other countries (Simón 2010).

Furthermore, there are interesting facts regarding the contractual conditions of groups of workers with the lowest hourly wage (panel 2 of Table 2). First, there is a higher incidence of part-time work among the groups of workers with the lowest hourly wages. Specifically, the proportion of part-time work is 37% among women, 39% among young people, 32% among workers with lower levels of educational attainment and 41% among new labour market entrants. Those numbers are much higher than the incidence of part time in other sociodemographic groups. As a consequence, when the number of hours worked is considered in the analysis, the differences in wage income between individuals increase.

Second, young workers and new labour market entrants generally interrupt their periods of work more often, as they are more dependent on temporary contracts. There are no substantial differences between men and women or between persons with different levels of educational attainment on the number of days workers are not at work—because they are off work, on unpaid leave or laid off—. However, there are significant differences by age and by tenure. Specifically, according to the Earnings Structure Survey (EES) data, there are up to five days' difference in time actually worked per month between different age groups and between new labour market entrants and all other workers. All in all, inequality measures are higher when monthly earnings rather than hourly wages are compared. Taking into account the number of hours and days worked in the month, in 2014 the wage income of the ninth

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[5] Similar regressions have been made with annual Spanish Labour Force Survey (EPA) wage data, converted to monthly, for full-time employees, obtaining similar differentials. Specifically, on the EPA figures, the differential would be around 17% for women, 22% for young people compared with older workers, 37% for university graduates compared with workers with only lower secondary education, and 22% for new hires compared with those with more than 10 years' tenure.

decile was 5.6 times higher than that of the first decile whereas, as indicated in the previous section, in terms of hourly wages this ratio was just 3.3 times (see Table 1). This increase in inequality is concentrated at the low end of the distribution. Thus, median wage-earners received 2.5 times more than the first decile in terms of monthly earnings (1.6 in terms of hourly wages), but they continued to receive slightly less than half the level of the ninth decile (2.2 in terms of monthly earnings, 2.1 in terms of hourly wages). Indeed, Spain is one of the countries that shows the largest increase in inequality when wages are analysed monthly rather than hourly, presenting a degree of wage income inequality above the median. In this respect, notable increases in inequality are also observed in other countries, such as Germany, the Netherlands, the United Kingdom and Austria (see panel 2 of Fig. 1), where there is a higher incidence of short-term and short-hour contracts among the groups with the lowest hourly wages.

3.2 Income, consumption and wealth inequality across households

3.2.1 Household income

As well as income from wages, individuals receive income from self-employment, capital income, unemployment benefits, pensions and other, mainly public, transfers that must be taken into account to analyse inequality. In addition, people do not generally take decisions in isolation but as members of a household, where different members may receive income and share the use of certain goods. Accordingly, total household income inequality must be considered as well as per capita[6] income inequality. For this purpose, we analyse below the EFF data for 2014 on gross per capita income and total household income, as the overall income of all household members and its characteristics.

In Spain there is a high correlation between the socioeconomic characteristics of adult household members. Specifically, the correlation between the educational attainment level of the head of household and his/her partner verges on 70% in Spain (see panel 1 of Fig. 3). This explains, for example, why when one household member is unemployed, there is a relatively high probability that the other household member is unemployed (panel 2 of Fig. 3). In consequence, households have a relatively limited ability to insure themselves from negative labour market shocks to one partner through the earnings of the other partner.[7]

As a result of this high correlation, the differences observed in individual wage income inequality do not narrow significantly when total household income is considered. One way to identify how household formation reduces the differences in household members' individual wage income is by comparing the measures of inequality of individual wage income and household wage income (see the first four columns of Table 3). If we consider a simulation where couples were formed under a random mating assignment, inequality in household income would be substantially lower than inequality in individual income. However, in the case of Spain, the measures of

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[6] As explained in Appendix 2 per capita variables are calculated using OECD equivalence scale.

[7] According to EPA this correlation has been increasing over time and hence the insurance mechanism has been decreasing over time.

1 CORRELATION BETWEEN EDUCATION LEVEL OF COUPLE (a)

2 EMPLOYMENT SITUATION OF THE PARTNER OF A HEAD OF HOUSEHOLD
THAT IS IN THE LABOUR FORCE (EMPLOYED OR UNEMPLOYED) (b)

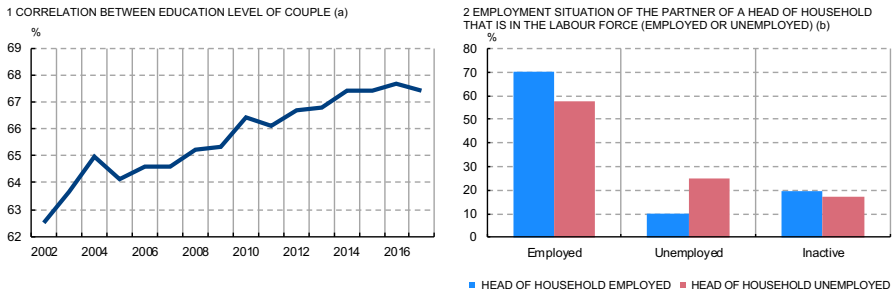■ HEAD OF HOUSEHOLD EMPLOYED ■ HEAD OF HOUSEHOLD UNEMPLOYED

Fig. 3 Assortative mating indicators. **a.** On EPA data for Q2 of each year. The values are obtained from a regression of the wife's education level on that of her partner, dummy variables for the year and interaction terms between the partner's education level and dummy variables for the year, with the coefficients estimated from the interaction terms. **b.** On EPA data for 2017 Q2. *Sources*: INE (EPA) and Banco de España

Table 3 Inequality indicators for various variables (2014). *Source*: Banco de España (EFF)

	Individual earned income (a)	Household earned income (a)	Gross per capita income	Gross total household income
Gini	0.43	0.43	0.40	0.43
P90/P10	10.86	9.99	6.25	7.00
P50/P10	4.29	3.96	2.44	2.73
P75/P25	3.00	2.88	2.61	2.96
P90/P50	2.53	2.52	2.56	2.57
	Net per capita income	Net household income	Total per capita consumption	Total consumption	Net wealth
Gini	0.37	0.39	0.31	0.33	0.68
P90/P10	5.71	6.15	4.00	4.42	
P50/P10	2.39	2.56	1.92	2.12	
P75/P25	2.37	2.66	1.99	2.20	
P90/P50	2.38	2.40	2.08	2.08	
P80/P20					15.49

a. Wage income figures exclude zeroes

inequality of household wage income compared with individual wage income are only slightly lower: specifically, the P90/P10 ratio for individual wage income is 10.9 and the P90/P10 ratio for household wage income is 10.0.

The bulk of household's income at the lower end of the per capita household's per capita income distribution comes from unemployment benefits and employment income (see Panel 1 of Fig. 4). At the worst point of the crisis, around 70% of the income of the first decile of the distribution came from unemployment benefits and wage or self-employment income. Pre-crisis, this figure stood at 50% and included a higher proportion of pensions and other public transfers, owing to the better relative position of wage income and the lower unemployment rate (in any event, unemployment benefits accounted for approximately 10% of total income in this decile).
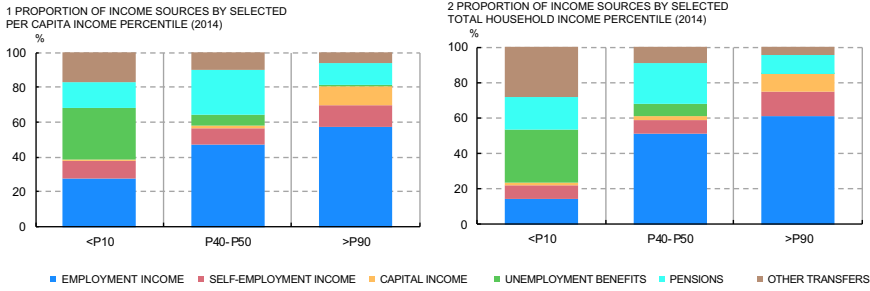
Fig. 4 Sources of income by per capita and total household income percentile (2014). *Source*: Banco de España (EFF)
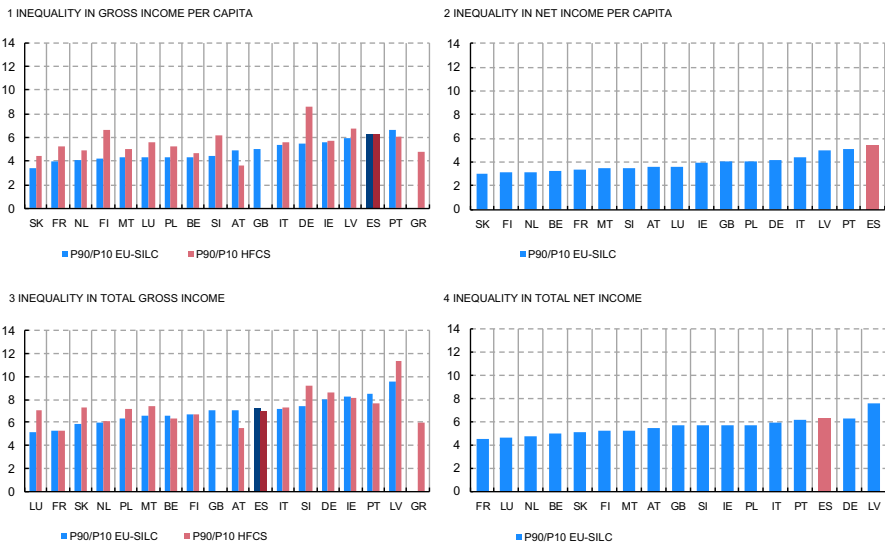

Fig. 5 International comparison of inequality indicators. Household income (2014). *Sources*: Eurostat (European Union Statistics on Income and Living Conditions—EU-SILC—) and European Central Bank (European Household Finance and Consumption Survey—HFCS—)

Compared to other European countries,[8] in Spain, per capita income inequality is relatively high. As Table 3 shows, the P90/P10 ratio for households' per capita income was 6.3 in 2014. Given the abovementioned structure of sources of income, this is attributable to the higher incidence of unemployment in Spain, which resulted in a high concentration of households collecting unemployment benefits at the low end of the distribution. In addition, the fact that the unemployment rate remained high, even in the most expansionary periods, meant that inequality in gross income per capita before the crisis was also high in Spain by international standards (panel 1 of Fig. 5).

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[8] This is according to the European Household Finance and Consumption Survey (HFCS) and the European Survey on Income and Living Conditions (EU-SILC).

The limited ability to obtain income at the low end of the distribution is mitigated by the relatively large average household size in Spain. This permits certain economies of scale in household expenditure. According to the literature, young peoples' decision to leave the family home is generally very closely linked to their job stability and, where there is a high incidence of short-term contracts, this is generally achieved at a relatively late age (Matea 2015; Barceló and Villanueva 2016, 2018). Moreover, the fact that young people are leaving the parental home later conditions the age at which they start to have children and the number of children they have. In consequence, Spain is one of the countries where the age of mothers at first birth is the highest and the fertility rate is the lowest (Adsera 2011). It is also one of the European countries with the lowest percentage of old people living alone or in institutional households. However, this is linked, at least in part, to the lower educational level of the older generations and, therefore, it will foreseeably change in the future in view of the increase in the level of educational attainment observed since the start of the last century.[9]

The late age at which young people leave the parental home and the high pension replacement rate (OECD 2017), among other factors, mean that Spain's inequality in total household income is relatively lower, when compared with that of other countries (panel 3 of Fig. 5). Indeed, the concentration at the low end of the household income distribution of households with older members that are chiefly supported by pensions may be explained by these household formation behaviour. Panel 2 of Fig. 4 shows that, in 2014, more than 50% of incomes in the first decile came from pensions and other, mainly non-employment, transfers.

Regarding other sources of household's income, self-employment income and capital income play a smaller role in explaining differences in inequality levels. Self-employment income made up 14% of total income within the 9th decile and 7% within the 1st decile. In turn, capital income amounted to 10% of total income of the 9th decile, and then decreased progressively for the lower deciles, down to 2% in the first decile.[10] The inequality indicators for market income, which comprises wage income, self-employment income and capital income, are very similar to those observed for wage income. However, when imputed income from home ownership is considered, the inequality between Spanish households becomes slightly narrower, in terms of total and per capita income. Indeed, imputing income from home ownership reduces total income inequality (Goerlich 2016). This is because, according to the EFF, 61% of households in the first income decile own their own homes, so their incomes, which are low without the imputed income, increase considerably when it is added.[11] By contrast, in the higher deciles, there is a proportionally lower increase in income when the imputed income is added, showing that the distribution of imputed income

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[9] Matea (2015) shows that once educational differences across European countries are taken into account, there is no major difference in the percentage of persons reporting to be household heads among the over-35s.

[10] In this case it must be considered that not all assets provide income, so that differences in wealth do not necessarily translate into differences in income.

[11] The EFF does not include information on implicit income from home ownership. However, in order to analyse the change in inequality if this income is taken into account it has been proxied. Specifically, for owner-occupier households, the market rent payable for their home is estimated, according to its current value indicated by the household and the interest rate on housing loans (in the year of the interview), deducting the housing depreciation cost (using a straight-line depreciation coefficient obtained from information supplied by the tax authorities).

from home ownership is considerably more uniform than the distribution of all other income overall. In particular, if imputed income from home ownership is added to total household income, inequality measured by the P90/P10 ratio falls from 6.3 to 5.9 in per capita income and from 7.0 to 6.7 in total income in 2014.

Finally, the progressive nature of direct personal taxes reduces inequality. The Spanish tax system's progressivity stems, in particular, from the existence of a non-taxable allowance and rising marginal tax rates in the personal income tax scale. To analyse the role that direct taxation plays in reducing inequality, the personal income tax paid by each household has been estimated by deducting tax liabilities from gross income to give after-tax income.[12] As Table 3 shows, net income inequality is lower than gross income inequality, measured by the Gini index or the income ratio p90/p10. Specifically, in accordance with the latter indicator, the ratio is 7.0 in gross terms and 6.1 in net terms. The results are the same when per capita income is analysed.

Personal income tax in Spain is slightly less progressive than the OECD average. One way to compare the degree of progressivity of different personal income tax systems is by analysing the different tax wedges—the difference between gross and net income—arising from personal income tax and social security contributions for different income brackets. According to OECD data, the difference in tax wedge between persons receiving 167% of their country's average income and those receiving 67% was 7.8 percentage points in Spain in 2016 compared with 8.1 percentage points for the average of the OECD countries. Accordingly, direct personal taxation reduces inequality in terms of gross income per capita by slightly less in Spain than on average in the OECD countries.

The redistributive nature of a tax system may be determined by differences in the parameters of other taxes in addition to income tax. However, the redistributive effects of indirect taxation in Spain (essentially value added tax and excise duties) are low because progressivity is limited (see Bover et al. 2017). This is not exclusive to the Spanish tax system and is because indirect taxation rates are essentially proportional and do not vary according to income. Thus, according to the European Commission, average effective VAT rates vary only slightly by income deciles in most EU countries (see Institute for Fiscal Studies 2011).

3.2.2 Household consumption and wealth

The level of inequality and the way in which it evolves is often discussed in terms of income. However, from the standpoint of utility or well-being, people's level of consumption may be more relevant. Consumption aggregates the goods an individual enjoys directly. As well as being influenced by individuals' expected income and the uncertainty surrounding that income, the purchase of these goods is also affected by wealth, which also determines potential access to external financing, as well as the point in the life cycle of the members of the household, and their access to public or subsidised goods (see Attanasio and Pistaferri 2016). In this regard, total consumption and per capita consumption show less inequality between households than net income (as Blundell et al. 2008). For example, the P90/P10 ratio for total consumption is 4.4,

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[12] The parametric function estimates are taken from García-Miralles et al. (2018).

compared with 6.2 for total net income (see Table 3). This happens at all levels of the income distribution, irrespective of whether income is measured in total or per capita terms and of the point in the economic cycle.

The smaller inequality in consumption that is observed partly reflects higher mobility of income at the tails of the distribution, despite the strong persistence of differences in the income distribution. The expected course of future income is a fundamental factor in explaining consumption decisions.[13] For its part, households' expectations about their future income largely depend on how their income and that of their social reference group have developed in the past.[14] Thus, in any economy where income mobility is very limited, levels of inequality will be highly persistent. In the case of Spain, using EFF data, it is found that 58% of households with a low relative income in 2011 (measured as the 20% lowest incomes) remained at this level in 2014, whereas the remaining 42% improved their relative position.[15] Meanwhile, a household's future income depends both on the current level of income and any shocks affecting it. Table 4 shows estimates of predictive income distributions, using household income data from the panel sample of the EFF, where income dynamics varies depending on the households' position in the income distribution in the preceding period and the size of the shock they receive at each age.[16] In this regard, according to the evidence shown in the table, in the face of (very) negative shocks (those in the bottom part of the shock distribution), the situation of households in the upper part of the income distribution tends to deteriorate sharply, to a much greater extent than in the case of households in the lower part of the income distribution. This asymmetry is relevant when analysing how different households form their income expectations and how these expectations affect consumption and spending. Specifically, given the effects of adverse shocks on them, higher income households tend to raise their saving rate. The opposite happens in the case of lower-income households, whose situation improves significantly in the event of (very) positive income shocks. That is, such "unusual" shocks are associated with lower persistence than other shocks and hence have a higher propensity to wipe

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[13] While not pursued here, income is sometimes decomposed into transitory and permanent components, and this distinction is potentially relevant because shocks of different durability will be expected to have different effects on consumption. Indeed, the empirical structural literature tends to find that consumption growth responds more to permanent income shocks than to transitory income shocks, although in general households are also able to partially insure permanent shocks [For the US see Blundell et al. (2008), Carroll (2009), and Kaplan and Violante (2010); for Italy, Jappelli and Pistaferri (2010); and for Spain, Casado (2011)].

[14] For evidence of the influence of the social reference group on consumption decisions in Spain, see Casado (2018).

[15] There is a scarcity of comparable data at international level on mobility over time. From the HFCS data for Germany, it was possible to verify greater mobility in Spain, as over the same period 72.5% of the German population in the lowest 20% of the income distribution remained in this situation in 2014.

[16] As detailed in Basso et al. (2017), those predictive distributions are based on a general first-order Markov process for the logarithm of household income (y_{it}), for a given household i and age of the household head t. In particular, the τ conditional quantile of y_{it}, where $\tau \in (0,1)$, is assumed to be a function of past income, y_{it-1}, and shocks u_{it}. Formally: $y_{it} = Q_t(y_{it-1}, u_{it})$, $(u_{it}|y_{it-1}, y_{it-2}, \ldots) \sim \text{Uniform}(0, 1)$. Hence, the shock u_{it} is a rank. A persistent shock of a magnitude comparable to y_{it} can be constructed, for instance, as $Q_t(\mu_t, u_{it})$ where μ_t is the mean of y_{it}, or as $Q_t(m_t, u_{it})$ where m_t is the median of y_{it}. Hence, for a given percentile of income in the preceding period, τ is a percentile of the distribution of shocks that households with that level of income receive.

Table 4 Income persistence by size of the shock and income percentile (a). *Source*: Banco de España

	Shock percentile						
	5	10	20	50	80	90	95
Income percentile in the preceding period							
5	1.09	0.95	0.80	0.58	0.32	0.19	0.08
10	0.98	0.89	0.79	0.65	0.41	0.28	0.22
20	0.85	0.80	0.75	0.70	0.50	0.39	0.37
50	0.68	0.65	0.66	0.73	0.60	0.54	0.57
80	0.49	0.46	0.51	0.73	0.69	0.72	0.77
90	0.37	0.34	0.41	0.71	0.73	0.82	0.89
95	0.25	0.20	0.27	0.68	0.77	0.93	1.00

a. Estimates of the derivative with respect to income in $t-1$ of a flexible income percentile function in t, given the income in $t-1$ and age in t, evaluated based on the value of average age for varying sizes of shock. See Basso et al. (2017)

out the history of past shocks. These dynamics cause significant revenue movements at the tails of the distribution,[17] which is consistent with the evidence that income inequality exceeds consumption inequality.

The way in which a household's consumption changes in response to fluctuations in income also depends on its level of wealth and, to a lesser extent, the age of its members. The wealthiest households are better able to maintain their level of consumption in the face of falling income, given that they may have assets or easier access to borrowing. Therefore, for these families, consumption will depend to a lesser extent on income than in other households, at least up to a certain age. Thus, it has been observed that in households headed by a person under 55 years, the availability of more wealth allows for more stable consumption, whereas in households headed by a person over 55, wealth barely plays any role in consumption stabilising. In effect, as Table 5 shows, the change in average household consumption in response to changes in income is smaller in wealthier families whose head of household is aged under 55. Specifically, among households with little relative wealth (at the 5th percentile) and a 30-year-old head of household, a 1% decrease in income causes a 0.5% drop in consumption, whereas this decrease is smaller (0.1%) among wealthier households (at the 95th percentile). However, in households aged over 55 years, the drop in consumption in response to a drop in income of 1% is always around 0.3%, regardless of the level of wealth.

Of course, certain public services, such as health and education, have a significant redistributive effect in consumption. There is empirical evidence using various methodological approaches and applying criteria to impute to households the value of public services provided by general government that shows that these services have a significant redistributive effect (see Goerlich 2016). In the case of education, for instance, this is particularly true for preschool and primary education, as well as for

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[17] For similar patterns in the United States and Norway see Arellano et al. (2017).

Table 5 Elasticity of consumption to changes in income by age and wealth percentile (a). *Source:* Banco de España

	Age							
	30	35	40	45	50	55	60	65
Wealth percentile								
5	0.52	0.49	0.45	0.42	0.39	0.36	0.33	0.30
	(0.37;0.64)	(0.37;0.58)	(0.37;0.53)	(0.35;0.49)	(0.33;0.46)	(0.28;0.44)	(0.23;0.44)	(0.17;0.43)
10	0.46	0.43	0.41	0.39	0.37	0.35	0.33	0.31
	(0.34;0.55)	(0.35;0.51)	(0.35;0.48)	(0.34;0.44)	(0.32;0.42)	(0.29;0.41)	(0.26;0.41)	(0.22;0.41)
20	0.41	0.39	0.38	0.37	0.36	0.34	0.33	0.32
	(0.31;0.49)	(0.32;0.46)	(0.32;0.44)	(0.32;0.41)	(0.32;0.40)	(0.30;0.39)	(0.27;0.39)	(0.25;0.40)
50	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
	(0.25;0.41)	(0.27;0.39)	(0.28;0.38)	(0.29;0.36)	(0.30;0.36)	(0.29;0.36)	(0.28;0.37)	(0.27;0.38)
80	0.25	0.26	0.27	0.28	0.30	0.31	0.32	0.33
	(0.18;0.34)	(0.20;0.33)	(0.22;0.33)	(0.24;0.33)	(0.26;0.33)	(0.26;0.35)	(0.25;0.37)	(0.24;0.39)
90	0.19	0.21	0.23	0.26	0.28	0.30	0.32	0.34
	(0.11;0.32)	(0.15;0.31)	(0.18;0.30)	(0.21;0.31)	(0.22;0.32)	(0.22;0.34)	(0.21;0.37)	(0.20;0.40)
95	0.14	0.17	0.19	0.22	0.25	0.28	0.31	0.34
	(0.03;0.31)	(0.08;0.29)	(0.12;0.28)	(0.16;0.29)	(0.18;0.31)	(0.18;0.33)	(0.17;0.36)	(0.15;0.41)

a. Estimates of elasticity of consumption to changes in income for households with different levels of net wealth and of different ages. The numbers in brackets represent 90% confidence intervals

compulsory secondary education, while the effects are less clear in the case of higher education.[18]

In terms of wealth inequality, as shown in Table 3, it greatly exceeds income inequality. Specifically, the Gini index is 0.68, much higher than observed in other variables analysed previously and the wealth ratio P80/P20 is 15.5.[19] Similarly, the wealthiest 1% own 20% of all wealth and the wealthiest decile holds 52.7% of total wealth.

Income dynamics explain, to some extent, the greater accumulation of wealth by high-income households. It should be borne in mind that wealth accumulates year after year, such that differences in wealth increase over time among those households that maintain their relative income positions. Moreover, as already mentioned, faced with the risk of a negative shock causing a significant reduction in their income, higher-income households tend to increase their savings, which is an additional explanatory factor in the dynamics of wealth inequality.[20] However, differences in wealth inequality derive not only from different saving habits, but also from differences in the composition of households' asset portfolios and the evolution of their prices. Ownership of assets is widespread, even among low-income brackets. Specifically, 94.3% of households in the first two income deciles own some kind of asset. However, the composition of these assets varies significantly with household income. Thus, in the first two deciles, 89.5% of total assets are associated with real estate property, whereas this percentage drops to 57.5% in the last decile. Asset holdings by this latter segment are related to self-employed business (15% total assets), and certain financial assets, such as shares and participating interests, which represent 11.2% of total assets. If prices of these assets perform better than those of real estate assets, this would tend to increase wealth inequality, and vice versa. Recent economic literature has emphasised the heterogeneity of access to different assets and their returns to explain the fact that wealth is more concentrated than income (see Gabaix et al. 2016; Fagereng et al. 2016).

In any event, unlike the case of income or consumption, the level of wealth inequality in Spain is lower than that in comparable countries. In comparative terms, again using information from the HFCS, it is observed that, despite the large differences in household incomes by international standards, Spain has a smaller wealth inequality (see Fig. 6), which may be related to the fact that there is a widespread concentration of saving in real-estate assets, even among higher-income households.

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[18] In any event, in order to analyse the individual benefits deriving from the public provision of a particular good it is necessary to know what income group spends most on that good as a percentage of its total spending. Those households that spend a larger percentage of their income on the subsidised good will benefit most from the introduction of a subsidy that does not take factors such as the income level into account. In this regard, for example, a subsidy on university education that is not proportional to household income would disproportionately benefit the wealthiest households as their spending on this type of education is higher.

[19] As financial and non-financial assets are much more concentrated than employment income, with a non-negligible fraction of people having no gross wealth or even negative net wealth (debt), wealth inequality is usually analysed using concentration indices and percentile ratios that do not include information for the first decile.

[20] This behaviour also has significant implications in terms of optimal fiscal policy, which is something that the economic literature is beginning to analyse. See Basso et al. (2017) and Guner and Yavuz (2017).
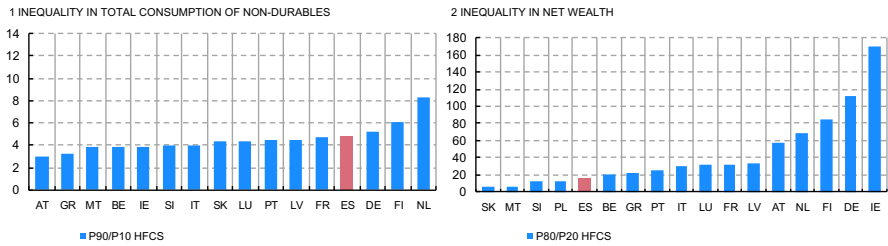
Fig. 6 International comparison of inequality indicators. Household consumption and wealth (2014). *Sources*: European Central Bank (European Household Finance and Consumption Survey—HFCS—)

4 Evolution of income, consumption and wealth inequality in Spain during the crisis (2008–2014)

We analyze the way in which inequality between Spanish households, in terms of their income, consumption and wealth, has varied over the course of the recent crisis. The analysis focuses in particular on the mechanisms driving up inequality in wage income and wealth, and on the various economic decisions and economic policy instruments that cushioned the increase in inequality during this period.

4.1 Wage income inequality across workers

Inequality in terms of hourly earnings remained fairly stable during the crisis, although there was a marked rise in the inequality in total earnings. Hourly earnings and full time workers' monthly earnings were relatively stable during the crisis across the whole distribution. However, when part-time employees are taken into account and the analysis period is extended, the increment in wage inequality between 2006 and 2014 becomes significant. Specifically, based on information from the Structure of Earnings Survey (EES) and the Continuous Sample of Working Histories (MCVL), over the period, real monthly wages dropped by 30% in the 10th percentile, by 10% at the median and by 5% in the upper part of the distribution (see Fig. 7). Consequently, inequality indicators remained unchanged in the case of hourly earnings, while they grew considerably, particularly in the lower part of the distribution, in the case of total earnings (see Fig. 7).

The key factor underlying developments in earned income during the crisis was the strong job destruction, of temporary jobs. Given that this type of contract is more widespread among young people and lower-qualified workers with low tenure, these groups were hardest hit by job losses. Thus, as Table 6 shows, between 2006 and 2014, job destruction profoundly changed the employee composition. The most significant changes were apparent in the distribution by age, studies and seniority, with a drop of around 14 pp in the share of workers aged under 30, around 13 pp in that of workers with an educational attainment of less than post-compulsory secondary education, and 21 pp in that of employees with fewer than three years of tenure in the company. These groups were generally in the lower part of the wage distribution.
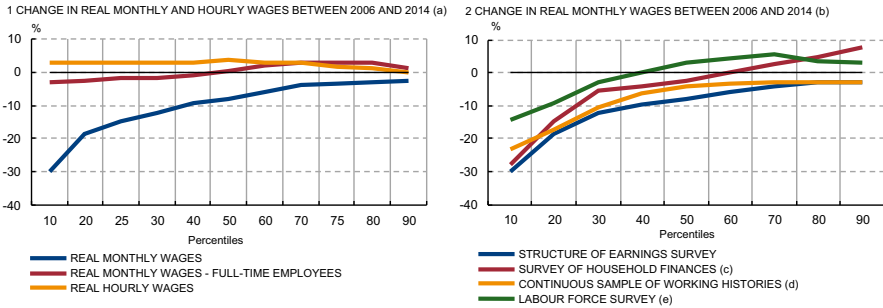
Fig. 7 Changes in wage earnings 2006–2014 by percentile. *Sources*: See notes. a. *Source*: National Statistics Institute (EES). b. *Sources*: National Statistics Institute (EES, EPA), Banco de España (EFF) and Ministry of Employment and Social Security (MCVL). c. Monthly wages calculated from annual wages for individuals in work at the time of the interview in the same sectors of activity as the EES. d. Monthly wages calculated from fiscal module for workers working the whole week. e. Monthly wages associated with main employment in the survey reference week

Table 6 Changes in the characteristics of employees 2006–2014. *Source*: National Statistics Institute (EES)

	Age			Education		Tenure	
	16–29	30–45	Over 45	Compulsory	Post-compulsory	0–3 years	Over 4 years
Proportion (%)							
2006	24.82	48.75	26.42	52.12	47.88	50.62	49.38
2014	10.74	52.99	36.27	39.46	60.54	29.87	70.13
Relative wage (a)							
2006	0.968	0.996	0.989	0.974	1.014	0.975	1.011
2014	0.953	0.987	0.998	0.961	1.007	0.962	1.000
Intra-group inequality (Gini index)							
2006	0.200	0.280	0.308	0.214	0.305	0.237	0.295
2014	0.204	0.268	0.294	0.208	0.285	0.252	0.276

a. The relative wage is the ratio between a group's average monthly wage and the average monthly wage of the whole population

Moreover, the drop in the number of hours worked during the crisis was concentrated in the lower-wage groups. The number of hours worked decreased during the crisis, mainly because there were more workers on shorter working hours, but also as a result of their shorter average day and the increase in the number of days without work. The rise in part-time work particularly affected less qualified junior employees aged under 30, among whom the rate of part-time work rose by almost 20 pp, irrespective of gender. As a result, the drop in the number of hours worked between 2006 and 2014 was particularly marked in the lower part of the wage distribution (see Fig. 8). Constraints on companies' ability to change working conditions in sector-wide agreements prior to the labour-market reform of 2012 meant the bulk of the adjustment requirement fell on jobs and hours worked (Anghel and Izquierdo 2018).
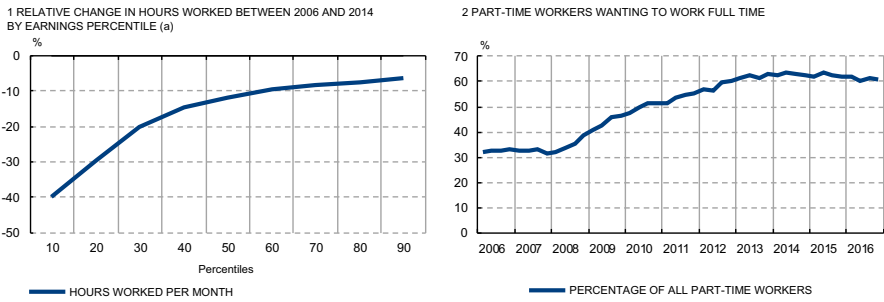
1 RELATIVE CHANGE IN HOURS WORKED BETWEEN 2006 AND 2014
BY EARNINGS PERCENTILE (a)

2 PART-TIME WORKERS WANTING TO WORK FULL TIME

HOURS WORKED PER MONTH

PERCENTAGE OF ALL PART-TIME WORKERS

Fig. 8 Changes in hours worked 2006–2014. a. Annual gross earnings percentiles, deflated by the CPI. The average number of hours corresponds to October, which is the EES reference month. *Source*: National Statistics Institute (EES, EPA)

Finally, between 2006 and 2014 there was a slight reduction in wage differentials by age and seniority. This wage compression is probably linked to a greater concentration of workers' wages near the minimum levels set in collective bargaining agreements (see Díez-Catalán and Villanueva 2014), which is consistent with a drop in extraordinary payments to those workers earning more than stipulated in the collective bargaining agreement (see Babecký et al. 2012). The use of the option introduced by the 2012 labour-market reform to unilaterally amend contracts could also explain this wage compression.
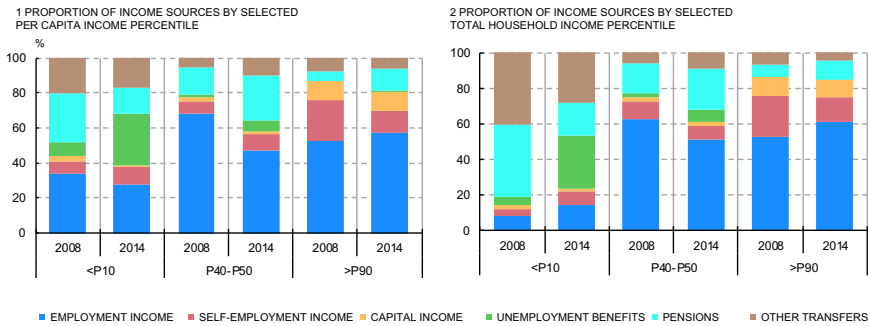
4.2 Income, consumption and wealth inequality across households

4.2.1 Household income

The way household income per capita developed during the crisis was largely driven by job losses and the replacement of wages by unemployment benefits. As a consequence of the crisis, and mainly as a result of many young people losing their jobs, the lower part of the per capita income distribution included a larger share of unemployed people who lost their wage income and started receiving unemployment benefits. Thus, the youngest and largest households, those with the largest share of their income from work, and above all from unemployment benefits, joined the 10th percentile of the per capita income distribution. Income deriving from unemployment benefits in this percentile, which had been just 8% of per capita income before the crisis, rose to 30% in 2014, highlighting the importance of these benefits as an insurance mechanism (see panel 1 and 2 in Fig. 9). To illustrate this, the third panel of Fig. 9 shows the results of a simulation exercise in which the income of individuals receiving unemployment benefits was replaced by zero. This simulation shows that unemployment benefits managed to narrow the increase in market income inequality by a third between 2008 and 2014 compared to a situation in which they did not exist.[21] On the other hand, in the lower part of the per capita income distribution there is also an important fraction

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[21] This simulation is conducted under the assumption that individuals would not change their behavior in the labour market.

CHANGES IN SOURCES OF INCOME BY PER CAPITA AND TOTAL HOUSEHOLD INCOME
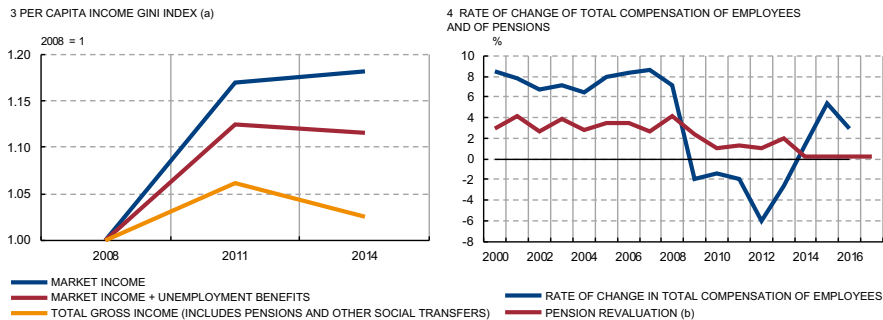PERCENTILE 2006-2014

1 PROPORTION OF INCOME SOURCES BY SELECTED
PER CAPITA INCOME PERCENTILE

2 PROPORTION OF INCOME SOURCES BY SELECTED
TOTAL HOUSEHOLD INCOME PERCENTILE

■ EMPLOYMENT INCOME ■ SELF-EMPLOYMENT INCOME ■ CAPITAL INCOME ■ UNEMPLOYMENT BENEFITS ■ PENSIONS ■ OTHER TRANSFERS

THE ROLE OF TRANSFERS AND PENSIONS

3 PER CAPITA INCOME GINI INDEX (a)

4 RATE OF CHANGE OF TOTAL COMPENSATION OF EMPLOYEES
AND OF PENSIONS

—— MARKET INCOME
—— MARKET INCOME + UNEMPLOYMENT BENEFITS
—— TOTAL GROSS INCOME (INCLUDES PENSIONS AND OTHER SOCIAL TRANSFERS)
—— RATE OF CHANGE IN TOTAL COMPENSATION OF EMPLOYEES
—— PENSION REVALUATION (b)

Fig. 9 The role of different sources of income. a. Household income adjusted using OECD equivalence scale. b. Pension revaluation including safeguard clause from previous year. *Sources*: Social Security, National Statistics Institute (EPA) and Banco de España (EFF)

of households receiving pension income and pensions performed more favourably during the crisis (see panel 4 in Fig. 9).

The per capita income inequality in P90/P10 rose from 5.8 to 6.3, i.e. less than the rise in individual earnings inequality. Strong job destruction during the crisis caused a rise in inequality, but this was smaller in the lower part of the distribution largely thanks to public subsidies, benefits and especially pensions. Household per capita income also dropped across the board, and, as in the case of earned income, households with lower per capita incomes suffered the biggest drop (see panel 1 of Fig. 10). Thus, 20% of households with lower per capita incomes suffered losses of over 15%, while the intermediate percentiles saw reductions of close to 10% and the upper percentiles a drop close to 5%.

The deterioration in the labour market during the crisis led to a rise in the participation rate among household members not previously in the labour force. In effect, when one of the members of the household was made unemployed, other members not previously participating in the labour market tended to start looking for work. This mechanism led to an increase in the female labour force participation rate in the early years of the crisis, with couples registering as unemployed together. However, most of the people who joined the labour force were unable to find work. In this regard, as
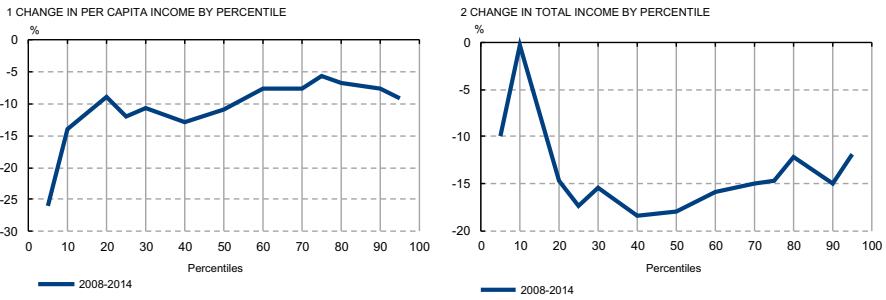
Fig. 10 Changes in per capita and total income. *Source*: Banco de España (EFF)

already discussed, the high correlation between both partners' socioeconomic characteristics meant that the negative conditions faced by one tended to be similar to those faced by the other (see Dolado et al. 2017).

Meanwhile, certain changes took place in the formation of households that helped offset falling incomes in the lower part of the per capita income distribution. There are various ways in which household formation and composition can change to increase income, reduce expenditure or benefit from economies of scale. In particular, household members in the workforce may choose to migrate abroad or households including women of childbearing age may change their plans to have children. Additionally, young people who have finished their education and are making the transition to working life may decide to postpone setting up home, while adults with family members on more stable incomes may decide to form a household together.

A marked drop in the birth rate has been observed since 2008, starting to recover slightly only in 2014. According to the INE, the number of births in Spain, which was already low by international standards, dropped from 44.7 children per thousand women of childbearing age to 39.1. The biggest drop in the fertility rate was in households in the percentile below the median per capita income, remaining constant in the higher percentiles, suggesting that this mechanism helped adjust spending for some low-income households.[22]

An increase in emigration abroad by some or all members of households of foreign nationality was observed as well. Thus, outflows of foreign nationals rose from 250,000 in 2008 to its maximum of 450,000 in 2013, such that the percentage of foreigners in the population declined from 11.1% in January 2008 to 9.5% in January 2017. Emigration also rose among the Spanish population, increasing from 30,000 individuals in 2008 to 95,000 at the height of the crisis. Emigration by the Spanish population was concentrated in the better qualified segments, meaning that emigration was not an option for those with lower qualifications seeking to improve their income (see Grogger and Hanson 2011; Izquierdo et al. 2016).

In parallel, young people delayed setting up home, breaking the previous trend. As Fig. 11 shows, the probability of young people aged 18–35 living with their parents

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[22] The INE does not provide information about the socioeconomic characteristics of women who have had children, although it is possible to calculate the approximate fertility rate from the number of children less than 1 year old in households that include women of childbearing age from the EFF in order to analyse how this rate varies across household per capita income percentiles.
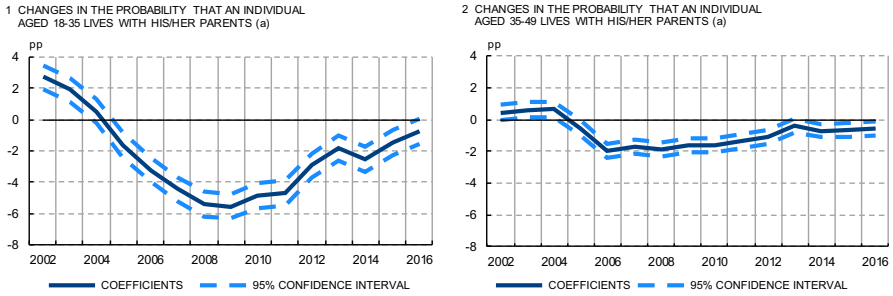
Fig. 11 Real insurance mechanisms available to households. a. Coefficients of the year dummy variable from a regression of the probability that an individual in the indicated age group lives with his/her parents, controlling for gender, age and educational level. EPA data for second quarter of each year (2002–2017). Reference year 2017. On average, within the period considered 50% of individuals aged 18–35 were living with their parents. This percentage falls to 8% when those aged 35–49 are considered. *Source*: National Statistics Institute (EPA)

had decreased since 2002. However, as of 2008 this downward trend was reversed, with a return to values similar to those of 2005. In particular, the change in trend was more pronounced among unemployed young people and those without university qualifications.

Finally, there was a very slight tendency for some families to consolidate the household so that some families could benefit from the greater stability of their parents' pensions. Between 2008 and 2014 there was a modest increase in the proportion of adults over 35 living with their parents, although the increase was strongest among unemployed adults.

Given these developments, the change in total household income in the lower percentiles was primarily driven by changes in pensions. As discussed before, a typical household in the lower part of the total income distribution is mainly supported by income from retirement pensions and other transfers, such as survivors' pensions. In this connection, average pensions progressed much more favourably than wage income over the course of the crisis (see panel 2 of Fig. 10).

Thus, the smaller relative weight of wage income for lower-income households reduced total income inequality. As panel 2 of Fig. 10 shows, total income fell across the board, but unlike the case of individual wage income discussed above, lower-income households' income performed better than that of households in higher percentiles. Specifically, percentiles below 20% suffered a drop of less than 10%, and in some cases almost no drop at all, while those in higher percentiles, which were more dependent on developments in wage income, saw their total income fall by at least 15%. Total household income inequality dropped from 8.2 to 7.0 on the P90/P10 indicator.

Net household income fell by somewhat more than gross income among higher-income families between 2008 and 2014, given the fact that personal income tax was made more progressive during this period. As can be seen in Fig. 12, this change mainly reflects the effect of modifications to personal income tax, for the most part starting
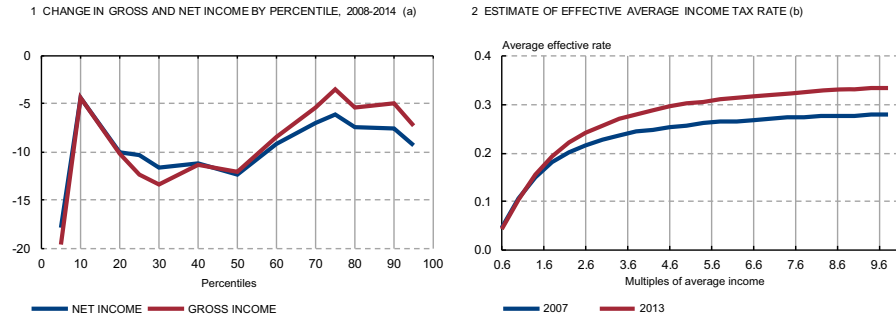
1 CHANGE IN GROSS AND NET INCOME BY PERCENTILE, 2008-2014 (a)   2 ESTIMATE OF EFFECTIVE AVERAGE INCOME TAX RATE (b)

Fig. 12 Changes in net income by percentile. *Sources*: See notes. a. *Source*: Banco de España (EFF). b. *Source*: García-Miralles et al. (2018): "The Spanish Personal Income Tax: Facts and Parametric Estimates," mimeo

in 2012 with a considerable rise in marginal rates, particularly affecting the upper segment of the income distribution.[23] The second panel of Fig. 12 shows estimated personal income tax for households in 2007 and 2013, indicating bigger growth in this period in the average rate paid by higher-income taxpayers, with a minor or negligible change for taxpayers in the lower part of the income distribution. As a consequence, the inequality of the distribution increased somewhat less in terms of net income than gross income.[24]

4.2.2 Household consumption and wealth

Inequality in both per capita consumption and income increased during the crisis. Per capita consumption suffered a decrease qualitatively similar to that in per capita income across the whole distribution (see panel 1 Fig. 13). The losses were most significant in the percentiles below 20% with drops in per capita consumption of almost 15%. Households in the 80th percentile and above registered losses of approximately 5%, whereas the intermediate percentiles were situated close to 10%. Overall, per capita consumption inequality rose across the whole distribution, as it did in the case of per capita income.

The biggest changes in consumption were in durable goods for households with lower per capita consumption. One mechanism households can use to insure against negative shocks is to delay the purchase of durable goods such as cars or household equipment. In Panel 2 of Fig. 13 shows how, during the crisis, in the lowest percentiles of per capita consumption, the drop in total consumption of goods exceeded that observed for non-durable consumption.

Meanwhile, developments in total income passed through to total consumption, albeit dampened, cushioning changes in levels of inequality in terms of consumption

[23] For example, the marginal rate on the general tax base increased between 4 and 7 pp for taxpayers earning more than €53,407.2, while it rose by up to 3 pp for taxpayers on lower incomes.

[24] During this period the most significant changes to indirect taxation were an increase in the general VAT rate from 16 to 21% and the lower rate from 7 to 10%. These changes were mainly intended to increase tax collection, with changes in the composition of this tax being marginal, such that the redistributive potential from the measures was minimal.
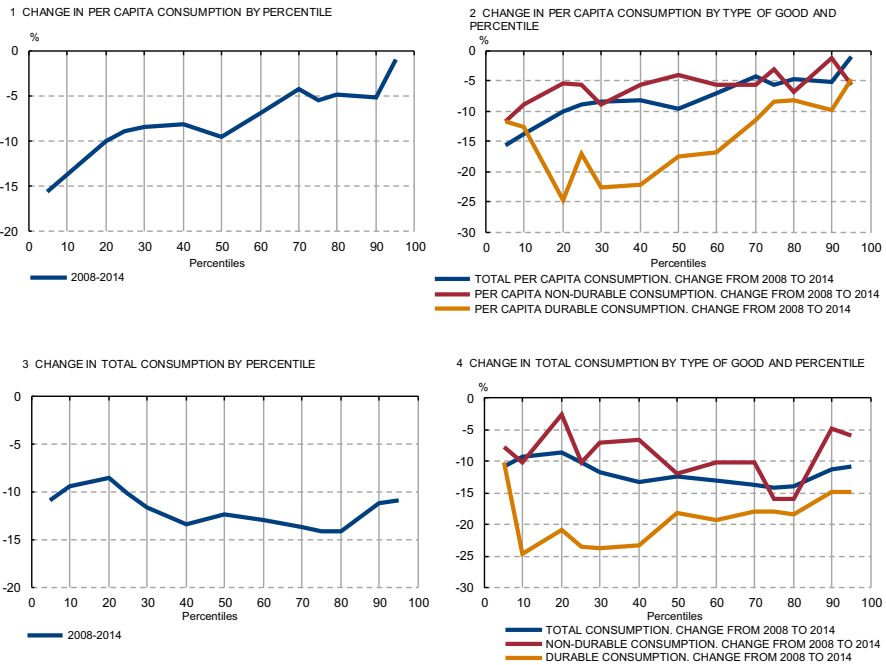
Fig. 13 Change in consumption by percentile and type of goods consumed. *Source*: Banco de España (EFF)

spending. Specifically, as shown in Panel 3 of Fig. 13, households in the percentiles below 20% of consumption spending suffered a decline in consumption of up to 10%, while households close to and above the median suffered a reduction of up to 14%. The inequality in total consumption dropped slightly in the lower part of the consumption distribution, while remaining virtually unchanged above the median.

Finally, wealth inequality grew significantly during the crisis. The Gini index for net wealth rose by almost a tenth of a percent over the period from 2008 to 2014, after a period in which it had remained stable (see Fig. 14). This increase in wealth inequality is also confirmed with other concentration measures. The proportion of net wealth corresponding to the wealthiest 1%, 5% and 10% increased during the period. Thus, 10% of the population with the most wealth accumulated 44% of total net household wealth in 2008, a percentage that rose to almost 53% in 2014. Similarly, the percentage of net wealth of the wealthiest 5% of the population increased by 8 pp over the period 2008–2014, while the percentage of net wealth of the wealthiest 1% of the population increased by 5 pp.

The increase in wealth inequality was due to various factors. First of all, the average value of real assets, which are those in which the lower part of the income distribution holds most of its wealth, fell between 2008 and 2014 by more than 30%, while that of financial assets, mainly owned by the upper part of the wealth distribution, even rose in value. Moreover, the prudential saving of higher-income households, already mentioned, should be noted. Finally, in the lower-income segment there was a drop in the percentage of households purchasing real estate assets. Specifically, whereas
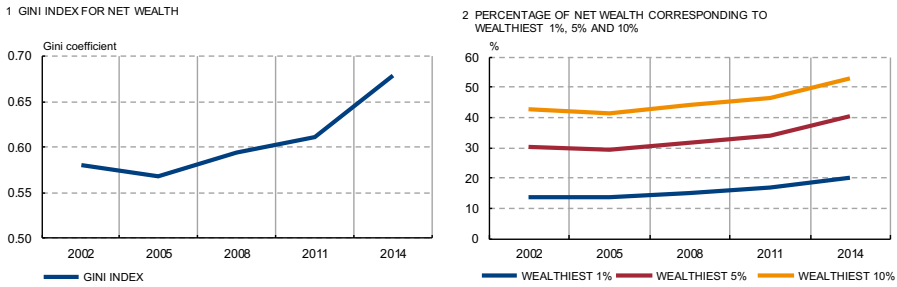
1 GINI INDEX FOR NET WEALTH

2 PERCENTAGE OF NET WEALTH CORRESPONDING TO
  WEALTHIEST 1%, 5% AND 10%

Fig. 14 Wealth inequality indicators. *Source*: Banco de España (EFF)

in 2008 78% of households in the first two income deciles were homeowners, this percentage had dropped to 67% by 2014, in contrast with the decline in this percentage in the ninth decile, which was just 3 pp.

5 Evolution of income inequality in Spain during the recent years (2014–2017)

Given that from 2013 Q4 Spain's economy started to recover from the recession, posting a high rate of employment growth which continues to date, analysing the changes in inequality in recent years is particularly relevant. The latest available year of the Spanish Survey of Household Finances (EFF) and the Structure of Earnings Survey (EES) is 2014. Therefore, there is no up-to-date information on changes in hourly earnings, consumption and wealth inequality in Spain. However, other statistical sources can be used to analyse recent changes in earnings inequality (up to 2016, using Labour Force Survey data) and in total gross and net income per capita inequality (up to 2017, using data from the Spanish Survey on Income and Living Conditions—ECV—).

As seen in Table 7, the measures of inequality in monthly earnings for full-time employees, which would approximate the behaviour of hourly earnings, remained largely stable. Thus, the P90/P10 ratio stood at 3.4 during the 2014–2016 period, only 0.1 pp above the value in 2008. This stability extends to all levels of income across the distribution. When part-time employees are included, the reduction in inequality during the early years of the recovery was more significant, since the P90/P10 ratio decreased from 5.1 in 2014 to 4.7 in 2016. This change, which was more significant at the bottom part of the wage distribution, almost unwound half of the increase in inequality observed during the crisis.

As regards gross household per capita income, inequality measured by the P90/P10 ratio declined during the 2014–2016 period from 6.3 to 6.1, recovering in this case a small share of the increase built up over the course of the crisis, although it must be noted that in this case earnings refer to 2015. However, in 2016 the P90/P10 ratio returned to the 2014 value of 6.3. Looking at the different parts of the per capita income distribution, we see that the evolution of inequality was stable over the period 2014–2017.

Table 7 Indicators of earnings and income inequality during the recovery period. *Source*: INE (Spanish Labour Force Survey and Survey of Income and Living Conditions)

1 Indicators of inequality in monthly earnings

	Monthly earnings—full-time employees			Monthly earnings—all wage-earners		
	2014	2015	2016	2014	2015	2016
Gini	0.28	0.29	0.28	0.33	0.34	0.32
P90/P10	3.43	3.49	3.38	5.12	4.67	4.67
P50/P10	1.72	1.69	1.69	2.45	2.25	2.25
P75/P25	1.92	1.91	1.89	2.15	2.10	2.10
P90/P50	2.00	2.06	2.00	2.09	2.08	2.08

2 Indicators of inequality in gross and net household income (a)

	Gross household income per capita				Net household income per capita			
	2014	2015	2016	2017	2014	2015	2016	2017
Gini	0.38	0.38	0.38	0.38	0.35	0.34	0.34	0.34
P90/P10	6.30	6.34	6.07	6.35	5.40	5.45	5.28	5.35
P50/P10	2.65	2.68	2.57	2.71	2.56	2.60	2.53	2.56
P75/P25	2.63	2.59	2.61	2.64	2.29	2.27	2.30	2.33
P90/P50	2.37	2.36	2.36	2.35	2.11	2.09	2.09	2.09

	Total gross household income				Total net household income			
	2014	2015	2016	2017	2014	2015	2016	2017
Gini	0.41	0.41	0.41	0.41	0.38	0.38	0.38	0.38
P90/P10	7.20	7.20	7.17	7.38	6.23	6.26	6.00	6.26
P50/P10	2.79	2.79	2.80	2.92	2.65	2.69	2.60	2.72
P75/P25	2.92	2.86	2.90	2.95	2.67	2.60	2.66	2.69
P90/P50	2.58	2.58	2.56	2.54	2.35	2.33	2.31	2.30

a. Household income per capita and consumption per capita are adjusted using the OECD equivalence scale. Income in 2014 euro

Likewise, the P50/P10 ratio for net income per capita remained at 2.6 over the period 2014–2017. In this case, the reduction of unemployment for the less-educated was especially slow in the first few years of the recovery, which limited the decline in the inequality indices. In addition, as a result of the greater presence of precarious employment at the low end of the distribution, inequality indicators decline less in the income per capita statistics than in the wage statistics. This is mainly because, similarly to the case of the EFF, the ECV sample is representative of all the population (including individuals who are employed, unemployed and inactive at the time of the survey), whereas the EES sample is restricted to individuals who have been at work throughout the month of October of the year of reference. Therefore, the impact of precarious employment is better reflected in the ECV.

Finally, despite the fact that inequality in per capita income did not change much during the recovery, it is noteworthy that inequality in total household income was lower in 2017 (and 2014) than in 2008, especially at the lower end of the distribution.

6 Conclusions

The recent economic crisis caused a marked rise in wealth and income inequality indicators in many OECD countries, including Spain. The economic literature has identified multiple channels through which inequality can affect economic growth by conditioning individuals' planned investment in physical and human capital. Understanding the causes and consequences of inequality, however, requires an analysis of the various relevant dimensions of this concept (wages, household income, consumption and wealth).

The analysis in this paper highlights the narrow wage dispersion in Spain while the high unemployment rate leads to a high level of inequality in terms of gross per capita income. Differences between employees' hourly wages in Spain are not particularly large by international standards, and did not rise during the crisis. By contrast, there was a very significant rise in unemployment and a reduction in the number of hours actually worked. This primarily affected lower-income groups, and so considerably increased inequality in wage income and households' per capita gross income. In general, the high unemployment rate implies that the level of gross income inequality in Spain is high compared to other countries, even during economic booms.

In Spain the level of inequality is lower when total household gross income is analysed and it decreased during the crisis as a result of public pensions evolving more favourably than wages. Various factors underlie the lower inequality observed in terms of households' total gross income, such as large average household sizes in Spain. This is partly due to young people tending to live with their parents for longer, and the fact that pensioners, who usually live in households with fewer members, are overrepresented at the bottom end of the income distribution. Consequently, the fact that average pensions evolved much more favourably than earnings over the course of the crisis reduced total household income inequality.

Inequality in per capita consumption rose during the crisis, particularly as a result of the drop in spending on durable goods. Consumption inequality is generally lower than income inequality. Also, developments in total income inequality over the past downturn were smoothed out in consumption to some extent.

Wealth inequality exceeds income inequality and increased over the course of the crisis, although Spain's wealth inequality is moderate by international standards. The fact that wealth inequality exceeds income equality is partly a result of high-income households saving more. Differences in the asset portfolios held by different population strata, in terms of asset types and their rates of return, are also important in understanding inequalities in wealth and how they have evolved. In particular, the fact that real assets (primarily housing) are a significant part of household wealth across the whole distribution helps keep wealth inequality in Spain low by international standards. Meanwhile, the ownership of financial assets by the highest income group

drove up inequality between 2008 and 2014, given that returns on financial assets outperformed those on real-estate assets.

Changes in inequality during the recent economic recovery suggest that the falling unemployment rate has narrowed inequality in wage income and per capita income. As happened during the crisis, both per capita and household consumption inequality followed changes in income, although somewhat less intensely. In particular, a recovery in consumption at the bottom end of the distribution is foreseeable. Lastly, the recovery in the value of real-estate assets in recent years should have helped temper wealth inequality.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest regarding this research.

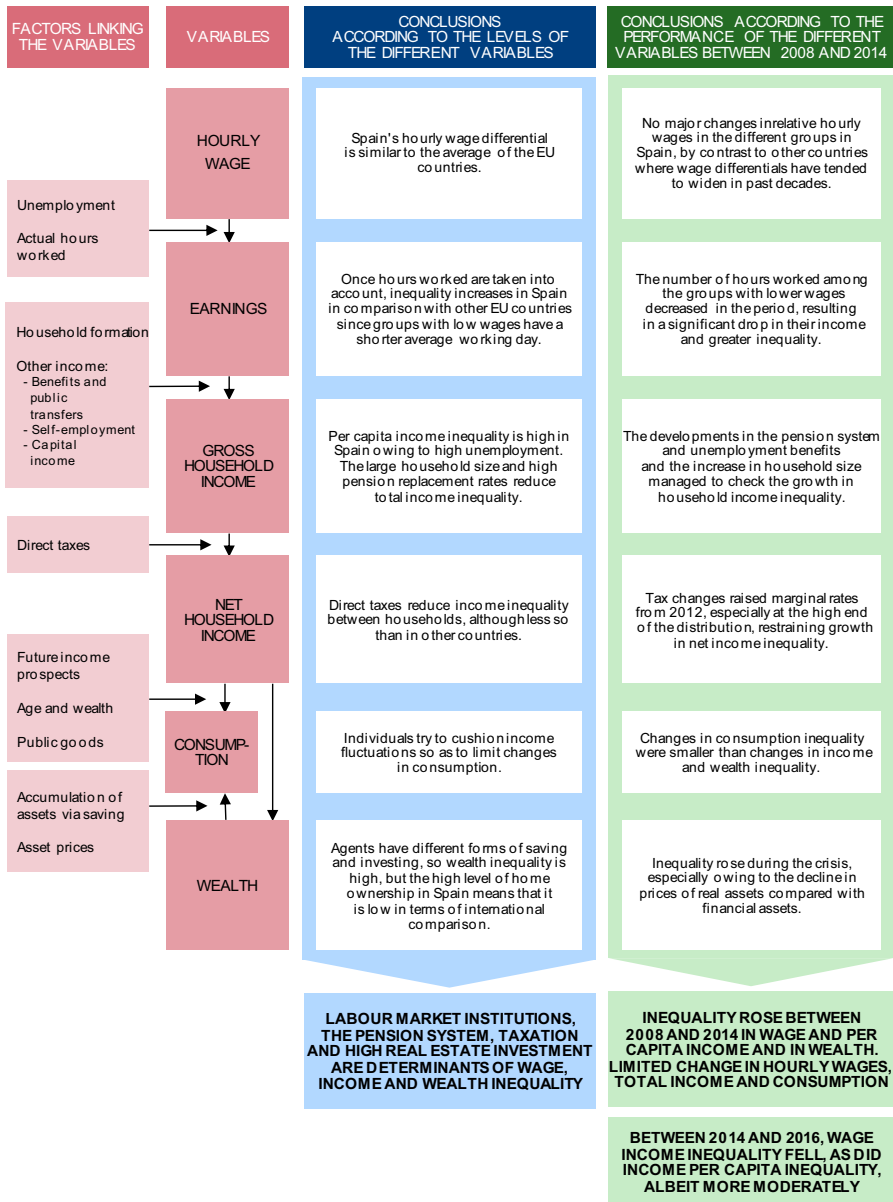## Appendices

Appendix 1

See Fig. 15.

Fig. 15 Income, consumption and wealth inequality: relationship between the variables and main conclusions drawn from their recent performance. *Source*: Banco de España

Appendix 2

See Table 8.

Table 8 Source databases and concepts included in the variables. *Source*: Banco de España

Databases	Variables	Description
Spanish structure of earnings survey (EES)		
Compiled by INE	Hourly wage	Calculated by dividing the gross monthly wage by the normal working week in the firm (taking as reference a week in October), multiplied by 4.35 plus the number of overtime hours worked in that month. Monthly wage includes: base wage, overtime pay, the two "extra" payments (as Spanish wages are generally paid in 14 rather than 12 monthly payments) and all pay supplements. Deflated using the CPI
EES 2006, EES 2014		
All calculations use the EES weights.		
The data on income and its components refer to the current year		
EES population: all wage and salaried workers employed in social security reporting units, irrespective of their size, and registered for the purposes of social security throughout the month of October of the reference year		
Excluding the CNAE 2009 sectors: Agriculture and fishing; Public administration and defence; Compulsory social security; Activities of households as employers of domestic staff; Activities of extraterritorial organisations and bodies		
Excluding chairpersons and members of boards of directors and, in general, all persons whose remuneration is mainly in the form of fees or profits rather than wages	Earnings	The gross monthly wage calculated from the gross annual wage, deflated using the CPI. Gross annual wage reflects total gross earnings, including payments in kind and extraordinary payments (the "extra" payments indicated above, profit-sharing, performance-related pay, incentives, bonuses and other remuneration that is variable in frequency or amount)

Table 8 continued

Databases	Variables	Description
Spanish survey of household finances (EFF)		
Compiled by Banco de España EFF 2002, EFF 2008, EFF 2011, EFF 2014 All calculations use the EFF weights and the five imputations (see "Survey of Household Finances (EFF) 2014: methods, results and changes since 2011", *Economic Bulletin* 1/2017, Banco de España) The data on income and its components refer to the previous year All variables are expressed in 2014 euro, using the CPI as deflator	Earnings	A person's gross annual income from wage or salaried work (including income in kind, the "extra" payments indicated above, bonuses, commission-based pay and overtime pay)
	Gross household income	Total household income includes wage income, self-employment income, capital income, unemployment benefits, pensions and other transfers of all household members, before tax and social security contributions, for the whole of the previous calendar year
	Net household income	Estimated after-tax household income. Calculated by applying to gross household income a function that relates gross income to the average effective personal income tax rate. The parameters of each function are estimated using the IEF-AEAT panel of microdata of persons filing personal income tax returns in Spain, in accordance with equations (1) and (5) of García-Miralles et al. (2018), "The Spanish Personal Income Tax: Facts and Parametric Estimates", mimeo

Table 8 continued

Databases	Variables	Description
	Total household consumption	Sum of annual expenditure on durable and non-durable household goods (includes food, schools, travel, mobile phones, service charges, utility bills…). Expenditure on durable goods is obtained as the depreciation value of the stock of the household equipment of real estate property and the value of household vehicles and other modes of transport
	Per capita income/consumption	Household income/consumption adjusted using the OECD equivalence scale which assigns a value of 1 to the first household member, 0.5 to each additional adult and 0.3 to each householder member under 14 years of age
	Net wealth	Total assets (real and financial) minus debt, excluding the value of cars or other vehicles

Appendix 3

Indicators of inequality with other databases

In this appendix we calculate the indicators of inequality for earnings and income, using two different data sources: the Labour Force Survey (EPA) for earnings and the Spanish Survey on Income and Living Conditions (ECV) for total gross and net income. Table 9 shows that the changes inferred from these surveys coincide with those documented by the EES and the EFF for the period 2008–2014.

Table 9 Indicators of earnings and income inequality during the recovery period. *Source*: INE (Spanish Labour Force Survey and Survey of Income and Living Conditions)

Indicators of inequality in monthly earnings

	Monthly earnings—full-time employees		Monthly earnings—all wage-earners	
	2008	2014	2008	2014
Gini	0.28	0.28	0.31	0.33
P90/P10	3.27	3.43	4.24	5.12
P50/P10	1.58	1.72	2.04	2.45
P75/P25	1.83	1.92	1.91	2.15
P90/P50	2.07	2.00	2.08	2.09

Indicators of inequality in gross and net household income (a)

	Gross household income per capita		Net household income per capita	
	2008	2014	2008	2014
Gini	0.36	0.38	0.33	0.35
P90/P10	5.27	6.30	4.54	5.40
P50/P10	2.30	2.65	2.17	2.56
P75/P25	2.46	2.63	2.22	2.29
P90/P50	2.29	2.37	2.09	2.11

	Total gross household income		Total net household income	
	2008	2014	2008	2014
Gini	0.4	0.4	0.37	0.38
P90/P10	7.6	7.2	6.42	6.23
P50/P10	3.1	2.8	2.86	2.65
P75/P25	2.9	2.9	2.62	2.67
P90/P50	2.4	2.6	2.25	2.35

a. Household income per capita and consumption per capita are adjusted using the OECD equivalence scale. Income in 2014 euro

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