Working Paper, Nº 15/22
Madrid, July 2015

Crisis, households' expenditure and family structure: The Palma ratio of the Spanish economy (2007-2014)

Antonio Villar

Crisis, households' expenditure and family structure: The Palma ratio of the Spanish economy (2007-2014)*

Antonio Villar[1]

Abstract

This paper analyses the changes in the distribution of households' standards of living, as measured by consumption expenditures, in Spain and its regions during the period 2007-2014. The data come from the lastest Continuous Survey of Family Expenditures (Encuesta Continua de Presupuestos Familiares), elaborated by the Spanish National Statistical Institute (INE). Inequality is measured in terms of the Palma ratio (a simple comparison of the share of total income or expenditure enjoyed by the richer 10 % of the population and the poorer 40 % of the population). The results show that: (i) The reduction in the aggregate expenditures has been coupled with a reduction of the inequality, contrary to what happens with income inequality. (ii) There is an extremely large variability of the results among the Spanish regions, so that average are note very informative about what is happening). (iii) The changes in the family structure are relevant to explain the evolution of the distribution of expenditures between households. (iv) There seems to be a change of tendency in 2013-2014: Richer households and middle classes increase their expenditures whereas the bottom 40% households keep reducing them.

Keywords: households' consumption, inequality, Palma ratio

JEL: D63, I3.

*: Thanks are due to Juan Ramón García López, from BBVA Research, for his extremely helpful assistance with the data and his insightful comments. Thanks are also due to Francisco Goerlich and José I. García-Pérez for their comments and suggestions
1: Pablo de Olavide University & European University Institute. avillar@upo.es

1. Introduction

Spain is one of the countries in which the economic crisis has hit harder, especially regarding the level of employment. The crisis arrived after a long period of economic expansion that involved a substantial increase of the active population, mostly due to the arrival of immigrants, and a large expansion of occupation. Even though the contraction of the Spanish GDP has not been much higher than that of other European countries, its unemployment rate rose up to 26% at its worst, a figure well above that of its neighbours. Nowadays the GDP seems to recover steadily and new employments are being created, even though going back to pre-crisis employment rates will most likely take a good while.[2]

The crisis is producing a number of relevant changes in the Spanish economy, beyond those that are commonly acknowledged by average macroeconomic data. The impact of the crisis in terms of GDP differs substantially between the Spanish regions. Unemployment has also hit differently regions, generations, and workers with diverse skills and educational levels. Moreover, the income distribution has been modified in many respects: changes in the spread of personal income, in the shares of labour and capital, among population cohorts, etc. (Herrero, Soler & Villar (2014), Villar (2014)). According to some estimates (OECD, Eurostat), Spain is one of the countries in which inequality and poverty have increased more. And yet those data do not seem to provide a full picture of what is happening.

The purpose of this paper is to analyse the changes in the distribution of households' standards of living, as measured by consumption expenditures, in Spain and its regions during the period 2007-2014. We shall use the latest data provided by the Continuous Survey of Family Expenditures (*Encuesta Continua de Presupuestos Familiares*), elaborated by the Spanish National Statistical Institute (INE), and shall measure inequality in terms of the *Palma ratio*. The Palma ratio (see Palma (2011)) is a simple comparison of the share of total income or expenditure enjoyed by the richer 10 % of the population and the poorer 40 % of the population (we discuss this measure in more detail later on).

Besides the primary interest of this exercise, consisting or providing an estimate of the evolution of the degree of inequality in households' consumption capabilities, there is also an underlying discussion on the importance of the methodological choices to understand the picture we get from the reality we analyse. To start with let us point out that one finds significant differences in inequality and poverty measures when comparing income or expenditures, or when analysing those measures in per capita terms or in terms of consumption units (families adjusted by size and composition). Those differences reflect the

[2] There are several reasons that explain why the Spanish labour market destroys so many jobs per unit of GDP decrease, among them the type of specialization of the Spanish productive system, the structure of human capital, and the institutional features of its labour market.

role of some social stabilizers (public taxes and transfers, social benefits, etc.), the impact of family savings to smooth out consumption, the role of consumption services provided by durable goods (particularly housing),[3] self-consumption or consumption in kind, the extent of the irregular economy or the presence of hidden earnings, differences in the elasticity of expenditures among social groups, changes in the households' structure, etc.

Behind those differences we find that families adjust to economic fluctuations in a number of ways that may not be well captured by income per capita values. Those adjustments range from delaying the replacement of durables to increasing the size of families by merging households made of relatives. This adjustment process probably explains why the extremely negative behaviour of employment and the substantial increase of inequality and poverty, that some statistics show, do not seem to fully translate into the average standard of living. As a consequence, the social conflict appears to be much smaller in Spain than in other countries with similar figures. This, needless to say, does not exclude the drama of many families that have been reduced to poverty, especially regarding those in which all members are unemployed or those with long-term unemployment.

One of the aspects addressed here is the role of changes in family size in the evolution of the standards of living in Spain. Those changes will help understanding why the data on inequality of expenditures regarding consumption units has varied so little since 2008 and even improved with respect to 2007 (a feature already pointed out in Herrero, Soler & Villar (2014), when analysing poverty). The bottom line is that the tightness of the family structure seems to play a relevant role in the response to the crisis, for the less well-off families. Indeed one observes that in 2007 the average size of the household for the whole population was larger than that of the poor households. The situation has been reversed during the crisis: in 2014 the size of the poor households has increased whereas the size of the average household has kept decreasing steadily. Those changes in poor households cannot be explained by alterations of the Spanish demographic patterns (the period is too short and the trend is that of a reduction of the population), but by the reunion of family members formerly constituting separate units. Which suggests that the size of the family behaves somehow as an inferior good in the lower part of the distribution, a feature with relevant implications for the evolution of consumption during crisis and recoveries.

The paper is organised as follows. Section 2 describes the methodological choices we make regarding the definition of income and the reference units. The inequality measure (the Palma ratio) is the subject of Section 3, where we also discuss the way of computing changes

[3] E.g. the data of the National Statistical Institute (INE) show that simply imputing the rent of owned houses reduces the measure of poverty in 2013 from 20.4 to 18.7.

in family composition. Section 4 contains the empirical analysis. A discussion in Section 5 closes the paper.

2 Methodological options

Measuring inequality in households' standards of living requires making some methodological choices, besides selecting a particular inequality index. As those choices determine the meaning of our evaluation exercise, understanding their nature and implications is crucial to get a sensible interpretation of the results we obtain. As suggested above, those methodological options are not a mere academic exercise but the way of conveying substance to the analysis and the key to interpret the outcomes.

In the present context those methodological options involve three main elements. First, we have to decide on the variable that approaches the standard of living, in particular on whether it refers to income or expenditure. Second, we have to identify the reference units, that is, whether our analysis refers to individuals, households or consumption units (households adjusted by size and composition). And third, we have to ensure that the variables are comparable by devising some transformation of current values into constant values.

2.1 Inequality of what?

Regarding the variable that approaches the standard of living, the basic decision refers to whether using a measure of earnings (disposable income, most frequently) or a measure of consumption (usually consumption expenditures). This is not a trivial decision as the results we obtain are quite sensitive to this choice (Atkinson & Brandolini (2001)). There are pros and cons in choosing one or another measure and thus one finds that there is no general agreement on this point (e.g. Slesnick (1991), (1993), Blundell & Preston (1996), Atkinson & Bourguignon (2000), Deaton & Zaidi (2002), Krueger & Perri (2006), Brewer & O'Dea (2012)).

We shall focus here on ***consumption expenditures*** rather than on disposable or market income. There are several reasons for that. First, because expenditures incorporate the agents' saving and borrowing decisions and are thus less sensitive to the economic fluctuations. Second, because expenditures seem to reflect better permanent income in terms of life cycle, smoothing the effect of differences in the demographic structure. Third, because data on expenditures, as elaborated by the Spanish National Statistical Institute, include not only the monetary flows devoted to paying final consumption goods, but also the worth of self-consumption, wages in kind, free lunches, the imputed rent of owned apartments, etc. (in

short, it is a more comprehensive measure of economic capacity). And fourth, because surveys on expenditures tend to be more reliable than surveys on earnings, due to the tendency to hide part of the earnings for fiscal reasons.[4]

2.2 Inequality among whom?

Consumption takes place within households (including single-member ones), so the household rather than the individual seems to be the natural reference unit to analyse inequality. At this point one has to decide how to treat households of different size and composition. We can think of two basic alternatives: the *per capita approach* and the *consumption unit approach*.

Let E_h denote the aggregate expenditure of household h and let $E=(E_1, E_2, ..., E_m)$ stand for the distribution of expenditures in a society made of m households, arranged in an increasing order of expenditure. Focusing inequality analysis on the distribution of this variable amounts to disregard the differences in the size and composition of the households. The ***per capita approach*** is the simplest way of taking into account the differences between households by computing the average expenditure, $e_h^{pc}=E_h/n_h$, where n_h is the number of members of household h. The limitation of this approach is twofold. On the one hand, it ignores that households with the same number of members may have different needs due to the differences in their composition. On the other hand, it disregards the economies of scale associated with the size of the households (mostly associated to the consumption of durables).

The ***consumption unit approach*** adjusts the households' expenditure by size and composition according to some equivalence scale. There are different ways of scaling households to define those consumption units.[5] We shall follow here the Eurostat (or *modified OECD*) convention according to which the first adult in an economic unit counts as 1, all other adults as 0.5, and children as 0.3. This convention is also the one adopted by the Spanish National Statistical Institute (INE). Let n_{ha}, n_{hc} stand for the number of adults and children of household h. The expenditure per consumption unit of this household, e_h^u, is thus given by:

$$e_h^u=\frac{E_h}{1+0.5(n_{ha}-1)+0.3n_{hc}} \qquad [1]$$

where:

[4] Still there is the problem of the difference between *consumption* and *consumption expenditures* mostly due to the difficulty of properly computing the services rendered by durables and public facilities. See Deaton & Zaidi (2002).

[5] See Atkinson, Rainwater & Smeeding (1995), McClements 1977, Pollak & Wales 1979, Buhmann *et al.* 1988, Cowell & Jenkins 1992a, 1992b, Banks & Johnson 1994, Jenkins & Cowell 1994, Ruiz-Castillo 1995, Cowell & Mercader-Prats 1999, Ebert & Moyes 2003. For a general discussion see Goerlich & Villar (2009, ch. 13).

$$n_h^u = 1 + 0.5\left(n_{ha} - 1\right) + 0.3n_{hc} \qquad [2]$$

is the equivalised size of the household. The number e_h^u can be regarded as a monetary measure of the household standard of living, as it corresponds to the expenditure that, if enjoyed by a single-member household, would yield the same welfare as a representative member of the original household.

Adjusting household expenditures using the equivalised size of the households is better than using per capita values, because in this way we are able to compute the presence of economies of scale and the differential needs within households. As the number of members of the household is $n_h = n_{ha} + n_{hc}$, the per capita expenditure will always be smaller than or equal to the expenditure per economic unit (equal only for one-member households).

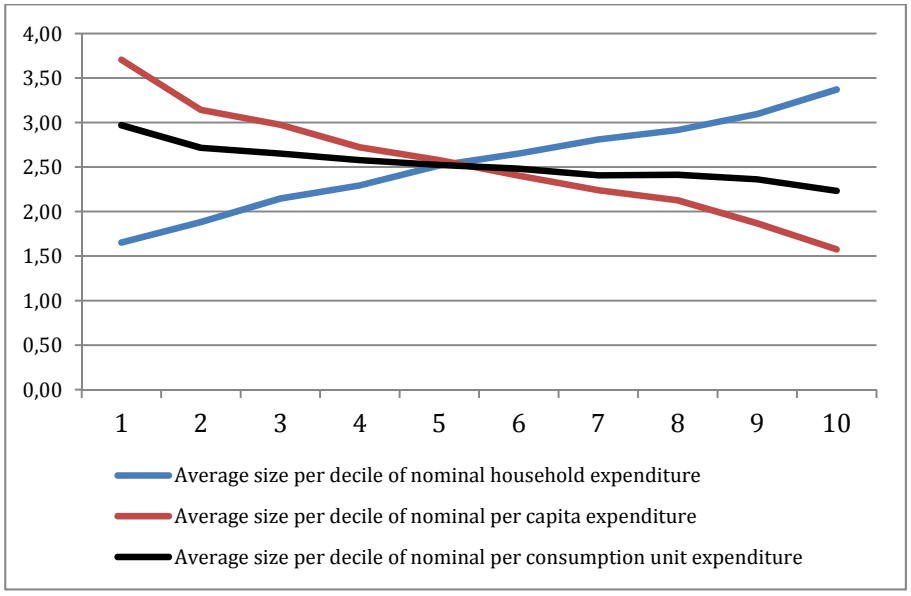
Note that the households' expenditure in terms of consumption units (or in per capita terms) can be used in a number of ways in order to calculate inequality. One is applying some inequality measure to the smoothed distribution resulting when the original households' expenditures are substituted by the corresponding average expenditures of consumption units, $e^u = \left(e_1^u, e_2^u, ..., e_m^u\right)$.[6] This is the usual approach when using the conventional *inequality indices*, such as Gini, Theil or Atkinson. When measuring inequality in terms of quantile measures (e.g. the 10/90 ratio, the 20/80 ratio or the Palma ratio), though, it is more natural to rearrange the original distribution of household expenditures, $E = \left(E_1, E_2, ..., E_m\right)$, by ranking households according to their consumption unit values, $E_u = \left(E_{u(1)}, E_{u(2)}, ..., E_{u(m)}\right)$. Now $E_{u(i)}$ precedes $E_{u(j)}$ in distribution E_u if and only if the expenditure per consumption unit of household *i* is smaller than that of household *j*. We shall follow here this way of measuring the Palma ratio.

One may wonder if there is much variation between the ranking of households in terms of household expenditures, per capita expenditure or per consumption unit expenditure. Figure 1 provides an illustration of how important is this choice, by comparing the average size of the households by deciles of total expenditure, per capita expenditure, and per consumption unit expenditure in Spain in the year 2013 (results are similar for all the years under study). The message is clear: the induced reshuffling is very important. When ordering households by total expenditure we observe a strong positive correlation between the

[6] This in turn admits two options. One is substituting each household by the corresponding mean value of the consumption unit. Another is substituting each household by as many individuals as it contains, assigning to each one the corresponding average expenditure. See Ebert (1995), (1997), (1999), Ebert & Moyes (2003) for a discussion.

position in the ranking and the size of the household. When ordering households by per capita expenditure, the strong correlation persists, but now is negative: households in the lower part of the ranking have more members than those in the upper part. The ranking of households by consumption unit expenditure is somehow in between, exhibiting a mild negative correlation between the position in the ranking and the size of the household.

Figure 1: The size of households per deciles according to total expenditure, per capita expenditure, and per consumption unit expenditure (2013)



2.3 From current to constant values

When analysing data corresponding to different periods one has to make them comparable by ensuring that each euro of expenditure represents the same purchasing power irrespective of the year under consideration. The standard procedure to do so is by deflating current values by some price index that describes the variation of the cost of the consumption basket of an average agent.[7] The consumption price index (IPC in the Spanish terminology), which is used to measure inflation, is the usual tool that permits one making this type of adjustment. Yet one can be more precise when defining those constant values by taking into account that price changes may differ not only across time, but also across regions and between different types of households (see Ruiz-Castillo (1998), Ruiz-Castillo, Ley & Izquierdo (1999a, b), for an analysis of the Spanish case).

[7] Needless to say this adjustment will also involve exchange rates when the analysis includes countries belonging to different monetary zones.

We shall adopt here the approach of calculating constant values using households' price indices, following the methodology developed by the BBVA Research Unit (see Situación (2014)). Those indices are built using the microdata from the family expenditures survey and the prices of 37 groups of products that conform the price index of each Spanish region. This survey contains information regarding consumption expenditures (both in money and kind) of each household depending on geographical aspects (e.g. region, type of municipality), and the main family features (size and composition of the family, income level, housing characteristics, etc.). In order to define the households' price index in Spain during the period 2007-2014, families have been grouped into "synthetic households" defined by those traits mentioned above. The combination of the different variables that are used yield a set of more than 1000 actual family types (among the potential 2160). Let us point out that the dispersion of purchasing power among households is significant and seems to have increased during the crisis; in particular, between 2007 and 2013 one may observe family types with negative inflation and other with price increases above 8% (see Situación (2014)).

3 Measuring inequality: The Palma ratio

3.1 Generalities

The degree of unfairness of the distribution of personal income is usually addressed in terms of some *inequality index*, a mapping that applies the space of income distributions into real numbers. Inequality indices are important constructs because they permit one analysing the evolution of inequality in a given society, the distributional impact of policy measures, the degree of fairness of different societies, or the introduction of distributional judgements in welfare evaluation (the United Nations inequality adjusted Human Development Index is a case in point). They also facilitate the analysis of the origin and nature of inequality, as some of these indices permit decomposing inequality between social groups or regions, as well as separating the part of the observed inequality that is due to differences in opportunity from that corresponding to differential efforts.

Different inequality indices provide different estimates on the dispersion of personal income or households' expenditure, mostly due to the way in which those indices treat changes at different parts of the distribution. The Gini index is the best known and most used inequality index, probably because it is a measure that admits an elementary geometric interpretation from the Lorenz curve. Other standard indices with somehow better analytical properties are the Theil indices, which allow decomposing inequality between and within population subgroups, and the Atkinson family of indices, which provide an explicit normative

support for inequality measurement. The reader may consult Goerlich & Villar (2009) for a general discussion.

A relatively simpler approach to inequality measurement derives from the comparison of different quantiles of the income distribution. One may consider the share of total income in the hands of the richest 1% or 5% or 10% of the population. Most often quantile measures are formulated in terms of ratios, as the 80-20 (or *quintile*) ratio, the 10-90 ratio, or the ratio between the median and the mean, which provides a measure of the asymmetry in the distribution. As it is the case with the Gini index and the indices of Theil, those measures can be derived directly from the Lorenz curve.

The advantage of quantile measures is that they are very intuitive and require little information and elaboration (besides they tend to be less demanding in terms of statistical significance). They are, therefore, accessible to the layman. The inconveniencies are also clear. On the one hand, they only provide information on one or two cuts of the distribution. On the other hand, changing the selected quantiles may change substantially the picture on the extent of inequality, without having good reasons to prefer one to another ratio.

3.2 The Palma ratio

In 2011 the Chilean economist Gabriel Palma published a paper in which he showed a surprising empirical regularity regarding income distributions across countries: the middle income groups, defined as those in the five deciles 5 to 9, get systematically about 50% of total income. The observed variability in inequality, therefore, would correspond to the way in which the other half of the total income is distributed in the complementary groups: the 10% richest and the 40% poorest (see Palma (2011)). From these data it follows that, roughly speaking, much of the distributional conflict concentrates on the battle of the rich and the poor for the half of the cake that is not enjoyed by the middle classes. Indeed, empirical results also show that the distribution of that half between the rich and the poor is very different among countries.

The ***Palma Ratio*** is defined as the ratio of the share of total income enjoyed by the richest 10% of the population and the share of total income in the hands of the poorest 40% of the population.

This proposal has received a lot of attention because it provides a simple quantile measure that is not arbitrary as the cutting points derive from relevant empirical regularities. Those regularities were later confirmed in the work of Cobham & Sumner (2013a), who showed the robustness of Palma's main results over time: the remarkable stability of the middle class capture across countries, coupled with much greater variation in the 10/40 ratio. Moreover, these authors showed that there is a very high correlation between the Palma ratio

and the Gini index. There are two reasons why the Palma ratio might be a better inequality measure than the Gini index. First, the Palma is more intuitive and easier to understand, both for policy makers and citizens.[8] Second, the Palma ratio overcomes the excessive sensitivity of the Gini index in the middle of the distribution and its relative insensitivity to changes at the top and bottom. By focussing of those parts of the distribution where the differences concentrate, it becomes an index that clearly speaks about the struggle between rich and poor and how changes in the middle class affect that division.[9] The Palma index should be seen, therefore, as a measure of group inequality, in the spirit of measures of gender or spatial inequality, say.

The judgement of Cobham & Sumner (2013b) about this index vis a vis the Gini index is clear: "While the Gini and the Palma (indices) are closely correlated… the Palma (index) should be strongly preferred as being 'over'-sensitive to changes in the distribution at the extremes, rather than in the relatively inert middle, since this is what matters to policymakers… The differences in sensitivity, combined with the relative stability of the intermediate deciles' income share, militate in favour of the Palma over the Gini. In addition, the clarity of the Palma favours its use for policy targets where popular engagement may be important for accountability."

In March 2013, a group of 90 well established economists (now including Nobel Prize-winning economist Joseph E. Stiglitz), academics and development experts urged a key United Nations economic development panel to considering inequality as one of the key concerns of economic and social development. They strongly suggested using the Palma ratio to measure it. Subsequently, Doyle & Stiglitz (2014) proposed to add "Eliminating Extreme Inequality" as a ninth Sustainable Development Goal for the post-2015 process.

The United Nations Development Program, the unit in charge of elaborating the Human Development Reports, has included lately data on the quintile and the Palma ratio, besides the Gini index. The OECD also provides statistics on this inequality measure.

The criticism to this ratio is the conventional one for quantile measures: this type of index disregards the effect of changes *within* the three blocks of population in which society is divided (the richer 10%, the poorer 40% and the middle classes). So any redistribution within those population subgroups does not affect the index. Moreover, the observed stability of the share of the middle classes may not hold on the long run (see Milanovic (2015)).

[8] These authors also provide empirical results that point out a link between countries' Palma ratios and their rates of progress on the major Millennium Development Goal (MDG) poverty targets.
[9] As there are three groups clearly defined, any change in the middle one will affect the relative position of the other two.

In order to define the Palma ratio in our context, let E_h denote the total expenditure of household *h* and consider the distribution of expenditures given by $E_u = \left(E_{u(1)}, E_{u(2)}, ..., E_{u(m)}\right)$. That is, the vector of household expenditures rearranged according to the expenditure per consumption unit. The Palma ratio relative to consumption units, ρ^u, is given by:

$$\rho^u = \frac{\sum_{h \in u(R_{10})} E_h}{\sum_{h \in u(P_{40})} E_h} \qquad [3]$$

that is, the ratio between the aggregate expenditure of the richest 10% households, arranged in terms of expenditure per economic unit, $u(R_{10})$, and the aggregate expenditure of the poorest 40% economic in the same arrangement, $u(P_{40})$.

Note that the mathematical structure o those formulae imply that if all households had the same size and composition, $E = E_u$, and, consequently, measuring inequality in terms of households, or in per capita terms, or in terms of consumption units would make no difference. The differences that we observe in inequality regarding households or consumption units will reflect, therefore, the reshuffling in the ranking of households due to the differential size and composition in the top 10% and the bottom 40% of each distribution. Those differences provide information about the impact of the different household structure, between the rich and the poor, on inequality measurement.

3.3 Households' structure and inequality

The subject of this section is to provide a simple way of dealing with the impact of changes in the households' structure on the evolution of this inequality measure. We shall do that by defining the notion of Adjusted Palma ratio (calculating the inequality that would have resulted under the assumption of a constant household structure).

Let m_{10}, m_{40} denote the number of households in the top 10% and the bottom 40% households of the distribution. We can define the average per household expenditure of the corresponding groups as follows:

$$\mu^u_{10} = \frac{\sum_{h \in u(R_{10})} E_h}{m_{10}}, \quad \mu^u_{40} = \frac{\sum_{h \in u(P_{40})} E_h}{m_{40}}$$

Let now s^u_{10}, s^u_{40} denote the average number of consumption units in the households at the top 10% and the bottom 40%, respectively, of the distribution of households arranged according to the consumption unit criterion. We can then obtain the *average expenditure of the consumption unit in each group* as:

$$\bar{e}_{10}^{u} = \frac{\mu_{10}^{u}}{s_{10}^{u}},\ \bar{e}_{40}^{u} = \frac{\mu_{40}^{u}}{s_{40}^{u}}$$

From this, and bearing in mind that $m_{40} = 4m_{10}$, we can write:

$$\rho^{u} = \frac{m_{10}\mu_{10}^{u}}{m_{40}\mu_{40}^{u}} = \frac{\bar{e}_{10}^{u}s_{10}^{u}}{4\bar{e}_{40}^{u}s_{40}^{u}}$$

Using this expression we can easily approximate what would have been the evolution of the Palma ratio if there were no changes in the households' structure. Let us consider two different time periods, t_0, t, and call $\rho^{u}(t/t_0)$ to the ***Adjusted Palma ratio***, that is, the Palma ratio relative to period t' but keeping the household structures of period t_0. We can write:

$$\rho^{u}(t_0) = \frac{\bar{e}_{10}^{u}(t_0)s_{10}^{u}(t_0)}{4\bar{e}_{40}^{u}(t_0)s_{40}^{u}(t_0)}$$

$$\rho^{u}(t) = \frac{\bar{e}_{10}^{u}(t)s_{10}^{u}(t)}{4\bar{e}_{40}^{u}(t)s_{40}^{u}(t)}$$

Therefore,

$$\rho^{u}(t/t_0) = \frac{\bar{e}_{10}^{u}(t)s_{10}^{u}(t_0)}{4\bar{e}_{40}^{u}(t)s_{40}^{u}(t_0)} = \rho^{u}(t)\frac{s_{10}^{u}(t_0)s_{40}^{u}(t)}{s_{40}^{u}(t_0)s_{10}^{u}(t)} \qquad [4]$$

The Adjusted Palma can be expressed as the Palma ratio of the end period times a coefficient that captures the relative change in the households' structure.

Remark.- *When there are several regions involved, as it will be the case in our empirical analysis, one may consider two alternative ways of defining the Adjusted Palma Ratio. First, take as the reference value for each region a common family structure for all regions. Second, take as the reference value for each region its corresponding family structure at the initial period. Even though each one is informative, we shall adopt the second interpretation, which involves neutralising temporal (but not regional) differences.*

4. The Palma ratio of Spain and its regions (2007-2014)

We present now the analysis of the household expenditures in Spain and its regions according to the methodological pattern described in Section 2. All data correspond to households, arranged according to their expenditure per consumption unit, and are expressed in 2011 constant values, using specific households price indices. The equivalence scale used to define consumption units is that adopted by Eurostat (first adult counts as 1, other adults as 0.5, and children as 0.3).

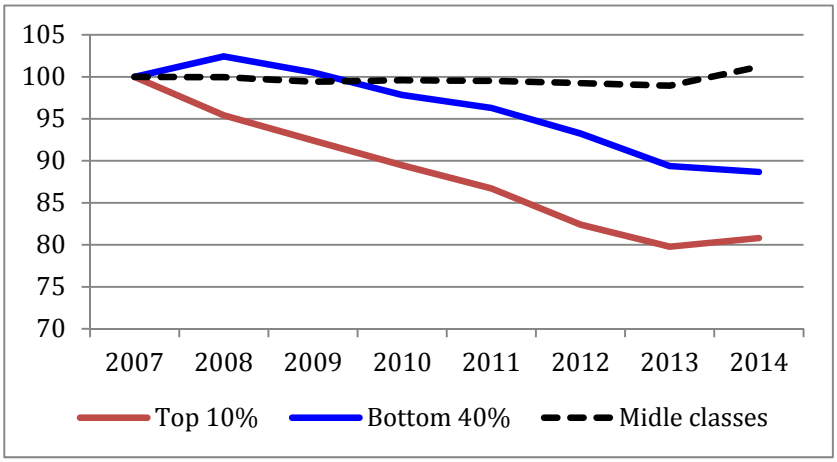
All the ensuing tables and graphics are built from the data of the last Spanish Expenditure Family Survey (*Encuesta de Presupuestos Familiares*) provided by the Spanish National Statistical Institute (INE (2015)). We have used each region's expenditure distribution to calculate the corresponding quantiles. This implies that the values that define the thresholds of the social groups differ among regions.

4.1. Overview

The total expenditure of the Spanish households has decreased during the period 2007-2014 by some 16%. The reduction of the expenditures differs both across social groups and between regions. In particular, the reduction of the expenditures in that period for the households in the top 10% of the distribution is of some 19%, while that corresponding to the bottom 40% is of some 11%. The relative share of the middle classes has changed very little and mostly in the last year. Actually 2013-2014 seems to mark a change of tendency in expenditures by the middle classes and for the richer households.

Figure 2 provides an illustration of the evolution of the relative expenditures of the social groups we are considering: top 10%, the bottom 40%, and the middle classes (the complementary social group), ordered according to their expenditure per consumption unit. We set the expenditure of each group in 2007 equal to 100 and then express the changes experienced relative to that value.

Figure 2: Relative expenditures of the households by social groups 2007-2014 (2007 = 100 for all social groups)



These simple data already point out the direction of the results we shall find when computing the Palma ratio and indicate a complex reality in which the social groups exhibit a different behaviour even at the aggregate country level, that somehow go against our

intuition. We shall see immediately that this complexity gets much worse when considering what happens across regions.

Table 1 provides information on the change in expenditures by regions and social groups. We observe that behind the Spanish average data there are very different realities regarding those social groups in the different regions. In particular, the variability of the changes in the bottom 40% is very large, with changes that range from a reduction over 17% in Comunidad Valenciana to an increase over 3% in Rioja. Regional differences in the variation in the top 10% are also large but less so, ranging from a reduction above 24% in Rioja, Comunidad Valenciana and Murcia to a reduction of less than 5% in Navarra.

Table 1: Rates of change (%) of household expenditures by social group and region (2007-2014)

	Total	Top 10%	Bottom 40%
Andalucía	-17.1	-20.6	-10.4
Aragón	-14.7	-17.0	-11.3
Asturias	-11.5	-20.9	-1.9
Baleares	-17.1	-18.9	-8.5
Canarias	-16.0	-26.6	-11.7
Cantabria	-14.9	-13.4	-15.5
Castilla y León	-17.1	-29.5	2.0
Castilla – La Mancha	-14.0	-20.5	-1.9
Cataluña	-17.0	-20.4	-14.3
Com. Valenciana	-21.6	-24.7	-17.6
Extremadura	-10.4	-20.6	7.0
Galicia	-13.5	-13.3	-10.8
Madrid	-14.7	-15.8	-16.6
Murcia	-18.7	-24.5	-11.7
Navarra	-8.8	-4.7	-5.9
País Vasco	-10.9	-13.8	-7.2
Rioja	-11.6	-29.7	3.4
Spain	-16.0	-19.2	-11.3

Remark. *It can be checked that smoothing the series by taking three-year moving averages changes slightly the numbers but does not affect the observed pattern. This means that those differences reflect something else than a diverse timing to absorb the crisis.*

4.2 The stability of the middle classes' shares and the Palma ratio

The key point of the Palma ratio proposal is that it provides a rationale for the choice of cutting points based on an empirical regularity. Namely, that the share of total income in the hands of "the middle classes" is fairly stable and around 50% of total income. It thus makes sense to start by analysing whether this is the case in the Spanish economy during the reference period, regarding households' expenditures.

Table 2 provides the information on the percentage of the aggregate expenditure enjoyed by the population between the richest 10% and the poorest 40%. We observe that expenditures of the Spanish middle class households represent some 56-57% of the aggregate expenditure, a figure rather stable both across time and between regions, even though on average this share has increased by 1% during the period (due to the change in the tendency observed in 2014). The average coefficient of variation of the columns is about 0.016 and that corresponding to the rows is some 0.015.

Those data justify, therefore, the use of the Palma ratio as a suitable inequality measure.

Table 2: Share of total expenditure of the middle classes

	2007	2008	2009	2010	2011	2012	2013	2014	Difference
Andalucía	55.9	55.9	55.3	55.1	55.8	55.4	55.0	56.8	0.9
Aragón	56.4	57.2	56.9	55.7	55.3	56.3	55.9	57.2	0.7
Asturias	55.8	56.3	54.9	55.4	55.7	54.3	55.4	57.3	1.4
Baleares	56.3	56.1	55.5	57.3	56.0	55.5	53.9	56.1	-0.2
Canarias	55.3	55.1	56.0	55.5	55.2	55.4	56.6	56.1	0.8
Cantabria	56.1	57.7	57.8	57.2	57.5	54.7	55.7	57.0	0.8
Castilla y León	57.0	57.6	56.9	55.5	55.5	55.9	55.1	56.7	-0.3
Castilla–Mancha	56.5	56.9	57.0	56.1	56.8	55.6	55.3	57.4	0.9
Cataluña	55.6	56.0	56.6	56.5	54.9	55.4	55.2	56.6	1.0
Com. Valenciana	56.1	56.1	55.9	55.9	56.2	55.2	55.0	56.3	0.1
Extremadura	56.0	57.5	55.5	57.2	55.8	55.5	54.9	56.9	0.8
Galicia	57.5	56.6	56.1	55.3	55.6	55.6	55.8	57.6	0.1
Madrid	55.0	55.5	54.8	55.6	55.6	55.5	55.6	56.4	1.4
Murcia	56.2	56.8	54.6	54.6	55.7	55.9	54.6	56.8	0.6
Navarra	57.0	56.2	56.5	56.5	56.9	55.8	56.0	56.9	-0.1
País Vasco	56.0	55.2	55.7	54.8	53.6	54.5	54.6	56.5	0.6
Rioja	54.9	56.1	56.2	55.5	55.0	55.5	55.7	56.0	1.1
Spain	56.1	56.1	55.8	55.9	55.8	55.7	55.5	56.8	0.7

Table 3 provides the information on the evolution of the Palma ratio in Spain and its regions between 2007 and 2014. There are several features worth commenting. First, the Palma ratio is smaller in 2014 than it was in 2007 in all regions, except Cantabria and Madrid,

with a global reduction of some 9%. Second, the dispersion of the index between regions is small within each year, as shown by the coefficient of variation. And third, the rate of change between 2007 and 2014 (last column of Table 3) varies substantially between regions, with reductions ranging from 1% in Madrid to -31% in Castilla y León or -32% in Rioja.[10]

Table 3: The Palma ratio (2007-2014)

	2007	2008	2009	2010	2011	2012	2013	2014	Var % 2007-14
Andalucía	0.99	0.95	0.92	0.94	0.90	0.86	0.88	0.88	-11.39
Aragón	0.93	0.78	0.78	0.82	0.87	0.86	0.82	0.87	-6.42
Asturias	1.13	0.95	1.07	0.94	0.91	0.88	0.86	0.91	-19.36
Baleares	0.89	0.81	0.84	0.87	0.80	0.78	0.78	0.79	-11.37
Canarias	1.05	0.91	0.87	0.91	0.98	0.90	0.85	0.87	-16.88
Cantabria	0.93	0.82	0.80	0.80	0.86	0.86	0.82	0.95	2.46
Castilla y León	1.18	0.97	0.92	0.94	0.82	0.81	0.82	0.82	-30.89
Castilla - La Mancha	1.08	0.98	0.93	0.90	0.83	0.80	0.90	0.87	-19.00
Cataluña	0.94	0.88	0.88	0.83	0.83	0.79	0.82	0.87	-7.11
Com. Valenciana	0.96	0.85	0.87	0.86	0.84	0.86	0.85	0.88	-8.63
Extremadura	1.24	0.91	1.12	1.00	0.95	0.94	0.97	0.92	-25.81
Galicia	0.91	0.97	1.02	0.96	0.93	0.95	0.91	0.88	-2.75
Madrid	0.84	0.80	0.79	0.85	0.83	0.83	0.84	0.85	0.95
Murcia	1.04	0.98	0.92	0.93	0.93	0.91	0.90	0.89	-14.47
Navarra	0.79	0.79	0.82	0.80	0.70	0.76	0.72	0.80	1.25
País Vasco	0.80	0.78	0.73	0.74	0.75	0.79	0.77	0.75	-7.11
Rioja	1.13	0.81	0.79	0.83	0.87	0.79	0.75	0.77	-32.00
Spain	0.99	0.92	0.91	0.90	0.89	0.87	0.88	0.90	-8.88
Coeff. variation	0.13	0.09	0.12	0.08	0.08	0.07	0.07	0.06	

4.3 The structure of households and the adjusted Palma ratio

The evolution of inequality that Table 3 presents does not fit very well with the picture of a country in which inequality and poverty have increased substantially during the crisis. One part of the explanation of those counterintuitive results derives from the use of expenditures rather than income, as we shall discuss later on (note also that measures of income and expenditure inequality are usually obtained from different surveys). The other part refers to the effect of changes in the size of consumption units. The structure of households has evolved differently in the upper and lower parts of the distribution. The households in the upper part

[10] The cases of Rioja and Castilla y León are rather peculiar and derive, as shown in Table 1, of a very large reduction in consumption of the top 10% households and a very different behaviour of the bottom 40%

of the distribution have kept the trend of reducing their size, as the country as a whole. Households in the bottom part of the distribution have increased their size to better accommodate the impact of the crisis. As a consequence, the difference in size between those social groups is now larger than it was in 2007.

To illustrate the impact of changes in the family structure, let us consider a simple example in which we double the expenditure and the size of a consumption unit, by merging two identical ones.

Example 1: Suppose we have two households consisting of two adults and two children, with identical expenditures, $E_1 = E_2 = E$. Clearly the per capita expenditure is E/4 and the expenditure per consumption unit is E/(1+0.5+0.3+0.3) = E/2.1.

Suppose now that the two households get together and form a single household with expenditure 2E. Per capita expenditure will not change whereas the figure of expenditure per consumption unit will increase. That is,

$$\frac{2E}{1+0.5\times 2+0.3\times 4}=\frac{2E}{3.2}>\frac{E}{2.1}$$

The improvement of the standard of living reflects the economies of scale derived from merging, derived from the convention of scaling families by size and composition.

Figure 3 provides a clear illustration of what has happened in Spain regarding the evolution of the household structure, in terms of consumption units. The size of the top 10% consumption units has decreased about 8% during the reference period, with reductions in all regions, whereas the size of the bottom 40% poorer consumption units has remained practically unchanged, even though there is a large variability between regions (see the Appendix). The size of the poor households, those with a expenditure below 60% of the median, has increased by some 9%. Overall the average size of consumption units in the whole population has decreased by some 5%, with reductions in all regions.

Figure 3: Evolution of the size of households (in consumption units)

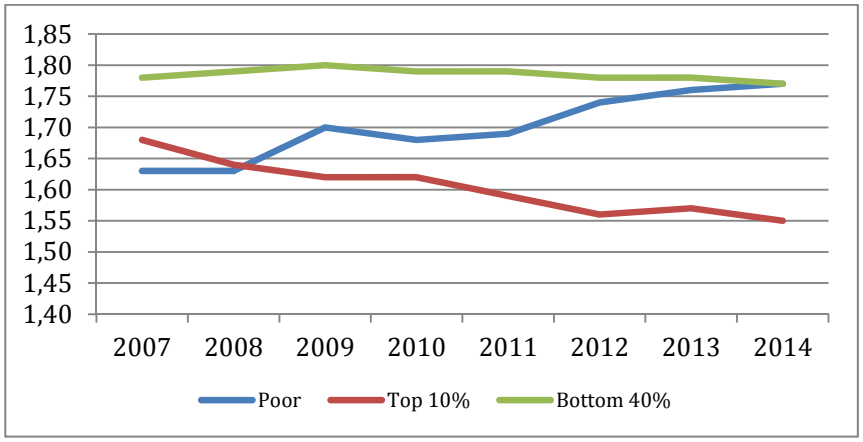


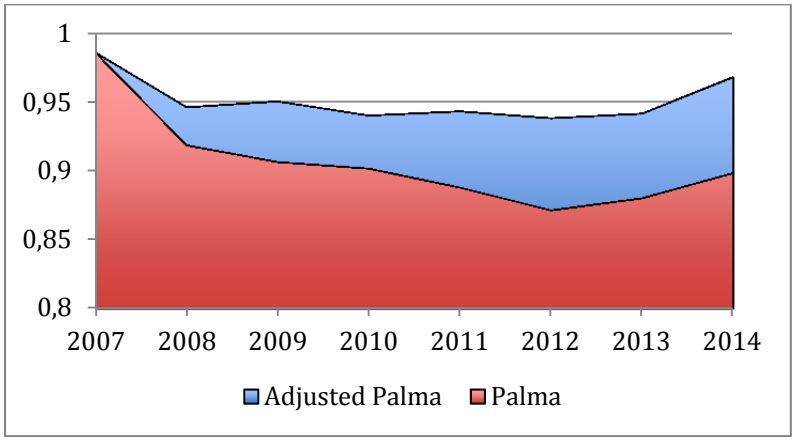
Table 4 provides the values of the Adjusted Palma ratio, that is, the evolution of inequality under the assumption that the households' structure keeps the 2007 values (see equation [4]). We observe that changes in family size and composition yield a variation of about 8% of the index, with a range of values that go from -2.8% in Cantabria to 25% in Extremadura. The intensity of family adjustments is also very different between regions. This implies, for Spain as a whole, that about 80% of the observed change in the index is due to the evolution of the households' structure.

Table 4: The Palma Ratio and the Adjusted Palma Ratio (2014/2007)

	2014	$\rho(2014/2007)$	% difference
Andalucía	0.88	1.00	14.2
Aragón	0.87	0.92	5.6
Asturias	0.91	1.06	15.9
Baleares	0.79	0.83	5.7
Canarias	0.87	0.95	9.1
Cantabria	0.95	0.92	-2.8
Castilla León	0.82	0.97	18.3
Castilla La Mancha	0.87	1.01	16.2
Cataluña	0.87	0.96	9.9
Com. Valenciana	0.88	0.92	5.3
Extremadura	0.92	1.15	24.9
Galicia	0.88	0.94	6.4
Madrid	0.85	0.85	-0.9
Murcia	0.89	0.89	0.6
Navarra	0.80	0.82	2.9
País Vasco	0.75	0.79	6.0
Rioja	0.77	0.94	21.4
Spain	0.90	0.97	7.8

Figure 4 illustrates the different behaviour of the Palma and the Adjusted Palma ratios during the period for Spain. The general pattern is that there is an improvement in the distribution of expenditures between 2007 and 2008 and then this process stops. Further reductions ever since are due to the changes in the structure of households, with an apparent change of tendency in the last two years.

Figure 4: Evolution of the Palma ratio and the Adjusted Palma ratio (Spain 2007-2014)



5. Discussion: Unequal inequalities[11]

The evolution of households' expenditure in Spain during the crisis exhibits some features worth stressing.

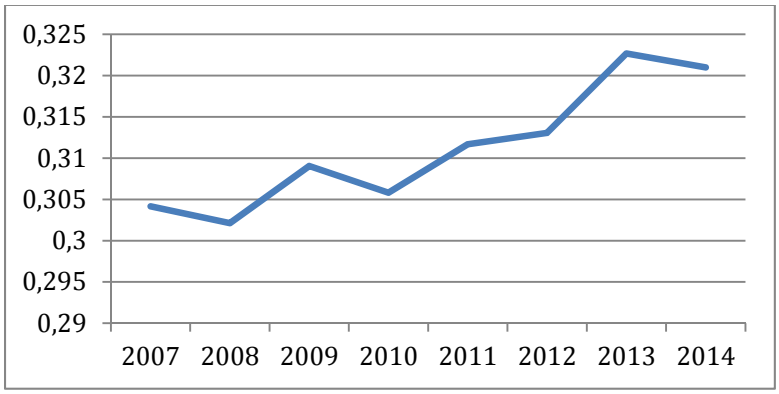
- First, the reduction in the aggregate expenditures has been coupled with a reduction of the inequality, as measured by the Palma ratio.
- Second, the data show an extremely large variability of the results among the Spanish regions, regarding the key variables: social groups have evolved so differently that it is difficult to provide a summary evaluation or a general pattern. In short, average values say little or nothing about what is happening.
- Third, the changes in the family structure are relevant to explain the evolution of the distribution of expenditures between households and the welfare levels.

[11] We borrow this title from the classical works of Serge C. Kolm (1976a, b), using the notion in a different way.

- And fourth, there seems to be a change of tendency in 2013-2014: Richer households and middle classes increase their expenditures whereas the bottom 40% households keep reducing them.

The reduction of inequality is perhaps the most striking of those features and one that deserves further comments, as this evolution contradicts the data on the estimates on the trend of income distribution produced by the main national and international institutions (OECD (2015), INE (2015)). Figure 5 below presents the evolution of the Gini index for the distribution of income, in terms of consumption units, using the same survey as that for expenditures.[12] Income inequality increases during the crisis and decrease when the recovery starts (whereas consumption inequality seems to behave the opposite way).

Figure 5: The Gini index for disposable income in terms of consumption units (Spain 2007-2014).

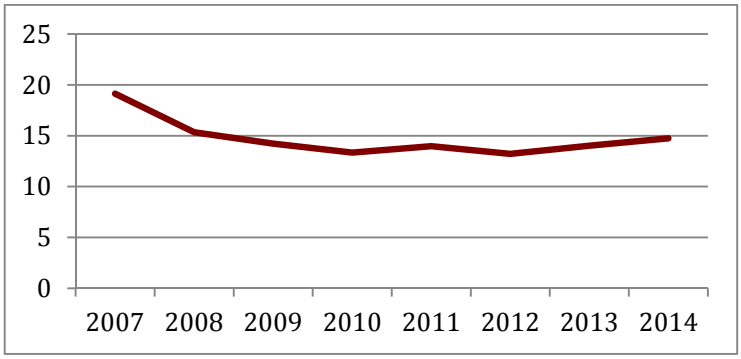


There are two questions that come to mind when facing such a discrepancy, before trying to understand its nature. First, has the distribution of households' expenditure really improved or is it a peculiarity of our way of measuring (the Palma ratio)? Second, does this phenomenon happen only in Spain or has it been observed elsewhere? The answer to both questions is negative.

A first test to check whether this is a peculiar behaviour of those groups is considering what happens when we look at more extreme situations. Figure 6 plots the ratio of the expenditures between the top 1% households and the bottom 1% (the very rich and the very poor, so to speak). The data show that the same pattern is observed. On average, the reduction of the inequality between those two groups has been even larger than that of the Palma ratio (a reduction of some 23% on average, 14 more points than the Palma ratio).

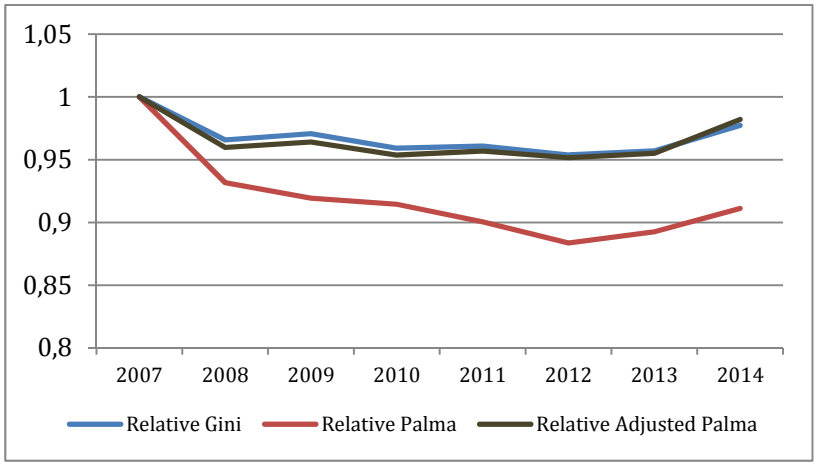
[12] Income inequality in Spain is usually obtained from the "Encuesta de Condiciones de Vida", a different survey that the one used for the analysis of households' expenditure.

Figure 6: Ratio 99/1 of household expenditures (Spain 2007-2014)



We have also computed the standard inequality indices, Gini, Theil and Atkinson (for $\varepsilon = 1$). All of them exhibit the same pattern: inequality in the distribution of the households' expenditure exhibits a cyclical behaviour during this crisis. Figure 7 illustrates the case of Gini with respect to Palma and Adjusted Palma (i.e. the Palma ratio discounting the effect of changes in family structure), when setting the values of all three measures equal to 1 in 2007. We observe a common pattern and also that the Adjusted Palma is almost identical to the Gini index.

Figure 7: Relative values of Gini, Palma and Adjusted Palma (Spain 2007-2014)



In summary, the crisis has induced a shift of the share of total expenditures in favour of the households in the lower part of the distribution and the recovery seems to start reverting the situation.

Regarding the second question, let us point out that a similar phenomenon has been observed in the United States, where income inequality and inequality in expenditures have evolved in opposite directions (something that did not happen before). The reader is referred

to the Works of Fisher, Johnson & Smeeding (2013) and Meyer & Sullivan (2013) for a discussion. The comparison is made in terms of the Gini index in the first case and in terms of the 90/10 ratio in the second one.[13]

There are several reasons that may explain the divergence in the measurement of inequality of income and expenditure (Figures 5 and 7). One is the ***wealth effect***, that is, the reduction in consumption related to the loss of value of households' assets, which has affected more to those holding larger amounts of assets. Another is the ***different elasticity*** of expenditures with respect to income between social groups: the households in the bottom of the distribution have less room to adjust their consumption due to the larger share of the expenditure devoted to basic needs. And there is also the difference between social groups in ***the dynamics of asset accumulation***: richer households are increasing their portfolios whereas those with less income are reducing their savings to cover their needs. Note that the data indicate that wealthier households have a slightly different ***timing***, reducing further and earlier consumption in relative terms, but also recovering more quickly. Finally one may consider that the expansion of the informal economy during the crisis may induce some underestimation of the earnings in the lower part of the distribution (there is evidence of this in the United Kingdom, as shown in Brewer & O'Dea (2012)).

The data also suggest that the adjustment of household consumption during the economic crisis occurs through mechanisms that are not properly captured by the variation in income per capita. In particular, it seems reasonable to explore further the hypothesis that disadvantaged households are reducing the impact of the crisis on their standard of living by increasing the size of the family units and dis-saving, while wealthier households would moderate its expenditure level and accumulating new assets.

[13] Brewer & O'Dea (2012) discuss also a similar problem regarding the data on income and expenditure in United Kingdom.

References

Atkinson, A.B. & Bourguignon, F. (2000), ***Handbook of Income Distribution,*** Volume 1. Amsterdam: Elsevier Science Publishers B. V. North Holland.

Atkinson, A. B. & Brandolini, A. (2001)**,** Promise and pitfalls in the use of 'secondary' data-sets: Income inequality in OECD countries as a case study, ***Journal of Economic Literature***, 39 : 771-799.

Atkinson, A. B., Rainwater, L. & Smeeding, T. M. (1995), Income Distribution in OECD Countries, **OECD Social Policy Studies**, No. 18, Paris.

Banks, J. & Johnson, P. (1994), Equivalence scale relativities revisited, ***The Economic Journal***, 104 : 883-890.

BBVA Research (2014), **Situación Consumo. Primer Semestre 2014**, BBVA, Madrid. Disponible en: https://www.bbvaresearch.com/public-compuesta/situacion-consumo-primer-semestre-2014/

Blundell, R. & Preston, I. (1996), Income, expenditure and the living standards of UK households, ***Fiscal Studies***, 16 : 40–54.

Brewer, M. & O'Dea, C. (2012): Measuring living standards with income and consumption: evidence from the UK, ***IFS Working Papers*** W12/12, Institute for Fiscal Studies.

Buhmann, B., Rainwater, L., Schmaus, G. & Smeeding, T. (1988), Equivalence scales, well-being, inequality, and poverty: sensitivity estimates across ten countries using the Luxembourg Income Study (LIS) database, ***Review of Income and Wealth***, 34 : 115-142.

Cobham, A. & Sumner, A. (2013a), Putting the Gini back in the bottle? "The Palma" as a policy relevant measure of inequality, **mimeo** Mach 2013.

Cobham, A. & Sumner, A. (2013b), Is It All About the Tails? The Palma Measure of Income Inequality, **Center for Global Development** w.p. 343.

Coulter, F. A. E.; Cowell, F. A. & Jenkins, S. P. (1992a), Equivalence scale relativities and the extend of inequality and poverty, ***The Economic Journal***, 102: 1067-1082.

Coulter, F. A. E., Cowell, F. A. & Jenkins, S. P. (1992b), Differences in needs and assessment of income distributions, ***Bulletin of Economic Research***, 44 : 77-124.

Cowell, F. A. & Jenkins, S. P. (2000), Estimating welfare indices: Household weights and sample design, ***Working Paper DARP*** nº 48 STICERD, LSE.

Cowell, F.A. & Mercader-Prats, M. (1999), Equivalence scales and inequality, ***Working Paper DARP*** no 27, STICERD, LSE.

Deaton, A. & Zaidi, S. (2002), Guidelines for constructing consumption aggregates for welfare analysis, ***LSMS Working Paper*** No 135, Washington D.C.: The World Bank. [http://www.worldbank.org/lsms]

Doyle, M.W. & Stiglitz, J. W. (2014), Eliminating Extreme Inequality: A Sustainable Development Goal, 2015-2030, **Ethics and International Affairs.org**

Ebert, U. (1995), Income inequality and differences in household size, ***Mathematical Social Sciences***, 30 : 37-53.

Ebert, U. (1997), Social welfare when needs differ: An axiomatic approach, ***Economica***, 64 : 233-244.

Ebert, U. (1999), Using equivalent income of equivalent adults to rank income distributions when household types are different, ***Social Choice and Welfare***, 16 : 233-258.

Ebert, U. & Moyes, P. (2003), Equivalence scales reconsidered, ***Econometrica***, 71 : 319-343.

Fisher, J. D., Johnson, D. S. & Smeeding, T. M. (2013), Measuring the Trends in Inequality of Individuals and Families: Income and Consumption, ***American Economic Review: Papers & Proceedings*** 2013, 103 : 184–188.

Goerlich, F. J. & Villar, A. (2009), ***Desigualdad y Bienestar Social. De la Teoría a la Práctica***. Fundación BBVA.

Herrero, C., Soler, A. & Villar, A. (2014), Desarrollo y Pobreza en España y sus Comunidades Autónomas, **Papeles de Economía Española**, nº 138.

INE (2015), ***Encuesta de condiciones de vida. Base 2013***, Madrid.

Jenkins, S. P. & Cowell, F. A. (1994), Parametric equivalence scales and scale relativities, ***The Economic Journal***, 104 : 891-900.

Jenkins, S. P. & Lambert, P. J. (1993), Ranking income distributions when needs differ, ***Review of Income and Wealth***, 39 : 337-356.

Kolm, S.-C. (1976a), Unequal inequalities. I, ***Journal of Economic Theory***, 12 : 416-442.

Kolm, S.-C. (1976b), Unequal inequalities. II, ***Journal of Economic Theory***, 13 : 82–111

Krueger, D. & F. Perri (2006), Does Income Inequality Lead to Consumption Inequality? Evidence and Theory, ***Review of Economic Studies***, 73 : 163-193.

McClements, L.D. (1977), Equivalence scales for children, ***Journal of Public Economics***, 8 : 191-210.

Meyer, B. D. & Sullivan, J. X. (2013), Consumption and Income Inequality and the Great Recession, **American Economic Review: Papers & Proceedings**, 103 : 178–183.

Milanovic, B. (2015), Why I'm still not excited by the Palma index, Blog **Globalinequality**, http://glineq.blogspot.com/2015/06/why-i-am-still-not-excited-by-palma.html.

OCDE (2015), ***In It Together. Why Less Inequality Benefits All***, OECD Publishing, Paris.

Palma, J. G. (2011), Homogeneous middles vs. heterogeneous tails, and the end of the 'Inverted-U': the share of the rich is what it's all about, **Cambridge Working Papers in**

Economics, 1111.

Pollak, R. A. & Walles, T. J. (1979), Welfare comparisons and equivalent scales, ***American Economic Review, papers and proceedings***, 69, 216-221.

Ruiz-Castillo, J. (1995), Income distribution and social welfare: A review essay, ***Investigaciones Económicas***, 19 : 3-34.

Ruiz-Castillo, J. (1998), A Simplified Model for Social Welfare Analysis. An Application to Spain, 1973-74 to 1980-81, ***Review of Income and Wealth***, 44 : 123-141.

Ruiz-Castillo, J., Ley, E. & Izquierdo, M. (1999a), La Medición de la Inflación en España. ***Colección de Estudios e Informes***, no 17, Barcelona: Servicio de Estudios de "la Caixa". [http://www.lacaixa.comunicacions.com/se]

Ruiz-Castillo, J., Ley, E. & Izquierdo, M. (1999b), Índices de precios para las EPF de 1980-81 y 1990-91 con base en 1983 y 1992, ***mimeo***, Departamento de Economía, Universidad Carlos III de Madrid. [http://www.eco.uc3m.es/investigacion/epf_ipc.html]

Ruiz-Castillo, J. & M. Sastre (1999), Desigualdad y bienestar en España en términos reales: 1973-74, 1980-81 y 1990-91, in J. M. Maravall Herrero, ed. ***Dimensiones de la desigualdad***, Madrid: Fundación Argentaria/Visor, 345-366.

Slesnick, D. T. (1991), The Standard of Living in the United States, **Review of Income and Wealth**, 37 : 363-386

Slesnick, D.T. (1993), Gaining ground: Poverty in the Postwar United States, ***Journal of Political Economy***, 10 : 1-38.

Villar, A. (2014), No es País para Jóvenes, **Panorama Social**, vol. 20, Segundo semestre, pp. 53-69, 2014.

APPENDIX: THE EVOLUTION OF THE AVERAGE NUMBER OF CONSUMPTION UNITS FOR THE DIFFERENT SOCIAL GROUPS

Table A.1: Average size of the household (number of consumption units)

	2007	2008	2009	2010	2011	2012	2013	2014	% variation
Andalucía	1.83	1.82	1.80	1.79	1.77	1.76	1.75	1.74	-5.05
Aragón	1.73	1.71	1.70	1.69	1.68	1.66	1.65	1.65	-4.47
Asturias	1.70	1.68	1.66	1.64	1.63	1.61	1.60	1.59	-6.48
Baleares	1.74	1.73	1.72	1.71	1.71	1.70	1.69	1.69	-3.02
Canarias	1.81	1.80	1.78	1.76	1.75	1.74	1.74	1.73	-4.35
Cantabria	1.77	1.75	1.73	1.71	1.69	1.68	1.67	1.65	-6.35
Castilla y León	1.72	1.71	1.69	1.68	1.67	1.65	1.64	1.63	-5.45
Castilla – La Mancha	1.80	1.79	1.78	1.77	1.76	1.75	1.74	1.72	-4.13
Cataluña	1.74	1.74	1.73	1.71	1.70	1.69	1.68	1.67	-4.13
Com. Valenciana	1.74	1.73	1.72	1.70	1.69	1.68	1.67	1.66	-4.69
Extremadura	1.78	1.77	1.75	1.74	1.73	1.72	1.70	1.69	-5.15
Galicia	1.82	1.80	1.79	1.77	1.75	1.74	1.72	1.71	-6.18
Madrid	1.79	1.78	1.76	1.74	1.73	1.71	1.69	1.68	-6.21
Murcia	1.89	1.88	1.86	1.85	1.83	1.81	1.79	1.78	-5.99
Navarra	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.67	-6.06
País Vasco	1.73	1.72	1.70	1.69	1.67	1.66	1.64	1.63	-5.70
Rioja	1.72	1.71	1.70	1.69	1.67	1.66	1.64	1.64	-5.12
Spain	1.78	1.76	1.75	1.74	1.72	1.71	1.70	1.69	-5.06

Table A.2: Average size of the household (number of consumption units) in the top 10% of the distribution

	2007	2008	2009	2010	2011	2012	2013	2014	% variation
Andalucía	1.74	1.70	1.67	1.66	1.60	1.59	1.58	1.54	-11.49
Aragón	1.71	1.61	1.63	1.65	1.65	1.51	1.55	1.61	-5.85
Asturias	1.77	1.68	1.73	1.57	1.65	1.54	1.45	1.50	-15.25
Baleares	1.67	1.67	1.57	1.59	1.54	1.55	1.58	1.57	-5.99
Canarias	1.71	1.69	1.49	1.61	1.68	1.55	1.53	1.55	-9.36
Cantabria	1.76	1.62	1.48	1.49	1.61	1.59	1.55	1.64	-6.82
Castilla y León	1.70	1.59	1.72	1.70	1.57	1.61	1.57	1.49	-12.35
Castilla – La Mancha	1.73	1.72	1.73	1.71	1.59	1.61	1.61	1.54	-10.98
Cataluña	1.64	1.64	1.59	1.61	1.57	1.55	1.57	1.51	-7.93
Com. Valenciana	1.64	1.57	1.55	1.54	1.54	1.58	1.60	1.53	-6.71
Extremadura	1.86	1.62	1.76	1.55	1.60	1.60	1.62	1.56	-16.13
Galicia	1.73	1.74	1.80	1.80	1.72	1.64	1.55	1.59	-8.09
Madrid	1.60	1.51	1.52	1.63	1.59	1.53	1.58	1.52	-5.00
Murcia	1.79	1.82	1.77	1.69	1.62	1.63	1.75	1.75	-2.23
Navarra	1.60	1.66	1.56	1.59	1.50	1.68	1.49	1.52	-5.00
País Vasco	1.65	1.64	1.55	1.56	1.59	1.61	1.55	1.52	-7.88
Rioja	1.86	1.55	1.53	1.57	1.52	1.47	1.44	1.56	-16.13
Spain	1.68	1.64	1.62	1.62	1.59	1.56	1.57	1.55	-7.74

Table A.3: Average size of the household (number of consumption units) in the bottom 40% of the distribution

	2007	2008	2009	2010	2011	2012	2013	2014	% variation
Andalucía	1.82	1.83	1.85	1.84	1.83	1.84	1.84	1.84	1.10
Aragón	1.69	1.69	1.72	1.73	1.72	1.71	1.69	1.68	-0.59
Asturias	1.65	1.67	1.63	1.65	1.64	1.69	1.64	1.62	-1.82
Baleares	1.71	1.75	1.81	1.73	1.83	1.79	1.86	1.79	4.68
Canarias	1.85	1.85	1.89	1.86	1.85	1.85	1.86	1.83	-1.08
Cantabria	1.80	1.75	1.76	1.76	1.67	1.74	1.69	1.63	-9.44
Castilla y León	1.62	1.65	1.63	1.67	1.71	1.68	1.69	1.68	3.70
Castilla – La Mancha	1.74	1.72	1.74	1.80	1.76	1.80	1.78	1.80	3.45
Cataluña	1.75	1.75	1.75	1.74	1.78	1.78	1.76	1.77	1.14
Com. Valenciana	1.74	1.78	1.77	1.77	1.74	1.74	1.74	1.71	-1.72
Extremadura	1.69	1.75	1.71	1.74	1.74	1.78	1.75	1.77	4.73
Galicia	1.79	1.78	1.77	1.77	1.76	1.74	1.77	1.75	-2.23
Madrid	1.88	1.86	1.88	1.80	1.80	1.77	1.77	1.77	-5.85
Murcia	1.86	1.85	1.95	1.92	1.89	1.89	1.89	1.83	-1.61
Navarra	1.79	1.78	1.78	1.78	1.74	1.70	1.76	1.75	-2.23
País Vasco	1.72	1.73	1.73	1.73	1.74	1.70	1.70	1.68	-2.33
Rioja	1.67	1.74	1.76	1.73	1.73	1.74	1.73	1.70	1.80
Spain	1.78	1.79	1.80	1.79	1.79	1.78	1.78	1.77	-0.56

Table A.4: Average size of the household (number of consumption units) of the poor

	2007	2008	2009	2010	2011	2012	2013	2014	% variation
Andalucía	1.73	1.78	1.87	1.90	1.80	1.91	1.86	1.94	12.14
Aragón	1.69	1.61	1.76	1.70	1.74	1.72	1.71	1.71	1.18
Asturias	1.56	1.61	1.59	1.62	1.72	1.70	1.68	1.65	5.77
Baleares	1.74	1.87	1.83	1.74	1.86	1.94	2.05	1.99	14.37
Canarias	1.74	1.97	1.90	1.95	1.85	1.91	1.96	1.88	8.05
Cantabria	1.79	1.69	1.71	1.81	1.79	1.84	1.72	1.63	-8.94
Castilla y León	1.58	1.63	1.67	1.70	1.68	1.76	1.74	1.75	10.76
Castilla – La Mancha	1.68	1.60	1.70	1.89	1.74	1.79	1.89	1.89	12.50
Cataluña	1.73	1.83	1.90	1.82	1.94	1.93	1.89	1.87	8.09
Com. Valenciana	1.75	1.83	1.83	1.83	1.91	1.81	1.88	1.84	5.14
Extremadura	1.58	1.65	1.74	1.79	1.79	1.91	1.92	1.91	20.89
Galicia	1.73	1.77	1.77	1.78	1.77	1.72	1.75	1.80	4.05
Madrid	1.85	1.92	1.94	1.87	1.89	1.89	1.96	1.87	1.08
Murcia	1.79	1.79	1.98	1.96	1.92	2.02	2.00	1.91	6.70
Navarra	1.71	1.72	1.79	1.80	1.78	1.72	1.77	1.83	7.02
País Vasco	1.70	1.78	1.71	1.83	1.84	1.76	1.77	1.72	1.18
Rioja	1.67	1.67	1.71	1.79	1.80	1.93	1.83	1.83	9.58
Spain	1.73	1.78	1.82	1.84	1.84	1.85	1.85	1.86	7.51

Working Paper

2015

15/22 **Antonio Villar:** Crisis, households' expenditure and family structure: The Palma ratio of the Spanish economy (2007-2014).

15/21 **Andrés Hernández, Bernardo Magnani, Cecilia Posadas, Jorge Redondo, Gonzalo Robles, Juan M. Ruiz y Enestor Dos Santos:** ¿Cuáles son los sectores con mayor potencial para aprovechar la Alianza del Pacífico?

15/20 **Gonzalo de Cadenas, Alicia Garcia-Herrero, Alvaro Ortiz and Tomasa Rodrigo:** An Empirical Assessment of Social Unrest Dynamics and State Response in Eurasian Countries

15/19 **Mariano Bosch, Angel Melguizo, Enith Ximena Peña and David Tuesta:** Savings under formal and informal conditions.

15/18 **Alicia Garcia-Herrero, K.C. Fung, Jesus Seade:** Beyond Minerals: China-Latin American Trans-Pacific Supply Chain.

15/17 **Alicia Garcia-Herrero, Le Xia, Carlos Casanova:** Chinese outbound foreign direct investment: How much goes where after round-tripping and offshoring?

15/16 **Diego José Torres Torres:** Evaluando la capacidad predictiva del MIDAS para la Eurozona, Alemania, Francia, Italia y Portugal.

15/15 **Alicia Garcia-Herrero, Eric Girardin, Arnoldo Lopez-Marmolejo:** Mexico's monetary policy communication and money markets.

15/14 **Evaluation of the effects of the Free Trade Agreement between the European Union and Mexico (EU-MX FTA) on bilateral trade and investment:** Saidé Salazar, Carlos Serrano, Alma Martínez, Arnulfo Rodríguez.

15/13 **Evaluación de los efectos del Tratado de Libre Comercio entre la Unión Europea y México (TLCUEM) en el comercio bilateral y la inversión:** Saidé Salazar, Carlos Serrano, Alma Martínez, Arnulfo Rodríguez.

15/12 **Alicia Garcia-Herrero, Eric Girardin and Enestor Dos Santos:** Follow what I do, and also what I say: Monetary policy impact on Brazil's financial markets.

15/11 **Noelia Cámara, David Tuesta, Pablo Urbiola:** Extendiendo el acceso al sistema financiero formal: el modelo de negocio de los corresponsales bancarios.

15/10 **Noelia Cámara, David Tuesta, Pablo Urbiola:** Extending access to the formal financial system: the banking correspondent business model.

15/09 **Santiago Fernández de Lis, José Félix Izquierdo de la Cruz y Ana Rubio González:** Determinantes del tipo de interés del crédito a empresas en la Eurozona.

15/08 **Pau Rabanal and Juan F. Rubio-Ramírez:** Can International Macroeconomic Models Explain Low-Frequency Movements of Real Exchange Rates?.

15/07 **Ándel de la Fuente y Rafael Doménech:** El nivel educativo de la población en España y sus regiones: 1960-2011.

15/06 **Máximo Camacho and Jaime Martínez-Martín:** Monitoring the world business cycle.

15/05 **Alicia García-Herrero and David Martínez Turégano:** Financial inclusion, rather than size, is the key to tackling income inequality.

15/04 **David Tuesta, Gloria Sorensen, Adriana Haring y Noelia Cámara:** Inclusión financiera y sus determinantes: el caso argentino.

15/03 **David Tuesta, Gloria Sorensen, Adriana Haring y Noelia Cámara:** Financial inclusion and its determinants: the case of Argentina.

15/02 **Álvaro Ortiz Vidal-Abarca and Alfonso Ugarte Ruiz:** Introducing a New Early Warning System Indicator (EWSI) of banking crises.

15/01 **Alfonso Ugarte Ruiz:** Understanding the dichotomy of financial development: credit deepening versus credit excess.

2014

14/32 **María Abascal, Tatiana Alonso, Santiago Fernández de Lis, Wojciech A. Golecki:** Una unión bancaria para Europa: haciendo de la necesidad virtud.

14/31 **Daniel Aromí, Marcos Dal Bianco:** Un análisis de los desequilibrios del tipo de cambio real argentino bajo cambios de régimen.

14/30 **Ángel de la Fuente and Rafael Doménech:** Educational Attainment in the OECD, 1960-2010.

Updated series and a comparison with other sources.

14/29 **Gonzalo de Cadenas-Santiago, Alicia García-Herrero and Álvaro Ortiz Vidal-Abarca:** Monetary policy in the North and portfolio flows in the South.

14/28 **Alfonso Arellano, Noelia Cámara and David Tuesta:** The effect of self-confidence on financial literacy.

14/27 **Alfonso Arellano, Noelia Cámara y David Tuesta:** El efecto de la autoconfianza en el conocimiento financiero.

14/26 **Noelia Cámara and David Tuesta:** Measuring Financial Inclusion: A Multidimensional Index.

14/25 **Ángel de la Fuente:** La evolución de la financiación de las comunidades autónomas de régimen común, 2002-2012.

14/24 **Jesús Fernández-Villaverde, Pablo Guerrón-Quintana, Juan F. Rubio-Ramírez:** Estimating Dynamic Equilibrium Models with Stochastic Volatility.

14/23 J**aime Zurita:** Análisis de la concentración y competencia en el sector bancario.

14/22 **Ángel de la Fuente:** La financiación de las comunidades autónomas de régimen común en 2012.

14/21 **Leonardo Villar, David Forero:** Escenarios de vulnerabilidad fiscal para la economía colombiana.

14/20 **David Tuesta:** La economía informal y las restricciones que impone sobre las cotizaciones al régimen de pensiones en América Latina.

14/19 **David Tuesta:** The informal economy and the constraints that it imposes on pension contributions in Latin America.

14/18 **Santiago Fernández de Lis, María Abascal, Tatiana Alonso, Wojciech Golecki:** A banking union for Europe: making virtue of necessity.

14/17 **Angel de la Fuente:** Las finanzas autonómicas en 2013 y entre 2003 y 2013.

14/16 **Alicia Garcia-Herrero, Sumedh Deorukhkar:** What explains India's surge in outward direct investment?

14/15 **Ximena Peña, Carmen Hoyo, David Tuesta:** Determinants of financial inclusion in Mexico based on the 2012 National Financial Inclusion Survey (ENIF).

14/14 **Ximena Peña, Carmen Hoyo, David Tuesta:** Determinantes de la inclusión financiera en México a partir de la ENIF 2012.

14/13 **Mónica Correa-López, Rafael Doménech:** Does anti-competitive service sector regulation harm exporters? Evidence from manufacturing firms in Spain.

14/12 **Jaime Zurita:** La reforma del sector bancario español hasta la recuperación de los flujos de crédito.

14/11 **Alicia García-Herrero, Enestor Dos Santos, Pablo Urbiola, Marcos Dal Bianco, Fernando Soto, Mauricio Hernandez, Arnulfo Rodríguez, Rosario Sánchez, Erikson Castro:** Competitiveness in the Latin American manufacturing sector: trends and determinants.

14/10 **Alicia García-Herrero, Enestor Dos Santos, Pablo Urbiola, Marcos Dal Bianco, Fernando Soto, Mauricio Hernandez, Arnulfo Rodríguez, Rosario Sánchez, Erikson Castro:** Competitividad del sector manufacturero en América Latina: un análisis de las tendencias y determinantes recientes.

14/09 **Noelia Cámara, Ximena Peña, David Tuesta:** Factors that Matter for Financial Inclusion: Evidence from Peru.

14/08 **Javier Alonso, Carmen Hoyo & David Tuesta:** A model for the pension system in Mexico: diagnosis and recommendations.

14/07 **Javier Alonso, Carmen Hoyo & David Tuesta:** Un modelo para el sistema de pensiones en México: diagnóstico y recomendaciones.

14/06 **Rodolfo Méndez-Marcano & José Pineda:** Fiscal Sustainability and Economic Growth in Bolivia.

14/05 **Rodolfo Méndez-Marcano:** Technology, Employment, and the Oil-Countries' Business Cycle.

14/04 **Santiago Fernández de Lis, María Claudia Llanes, Carlos López- Moctezuma, Juan Carlos Rojas & David Tuesta:** Financial inclusion and the role of mobile banking in Colombia: developments and potential.

14/03 **Rafael Doménech:** Pensiones, bienestar y crecimiento económico.

14/02 **Angel de la Fuente & José E. Boscá:** Gasto educativo por regiones y niveles en 2010.

14/01 **Santiago Fernández de Lis, María Claudia Llanes, Carlos López- Moctezuma, Juan Carlos Rojas & David Tuesta:** Inclusión financiera y el papel de la banca móvil en Colombia: desarrollos y potencialidades.

Click here to access the list of Working Papers published between 2009 and 2013

Click here to access the backlist of Working Papers:

Spanish and English

Contact Details:
BBVA Research
Azul Street, 4
La Vela Building - 4 and 5 floor
28050 Madrid (Spain)
Tel.: +34 91 374 60 00 and +34 91 537 70 00
Fax: +34 91 374 30 25
bbvaresearch@bbva.com
www.bbvaresearch.com