EFFECTS OF PENSION SPENDING ON INCOME AND EMPLOYMENT. EVIDENCE FROM SPAIN DURING THE ECONOMIC CRISIS

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Abstract

This paper is focused on the benefits that public spending on pensions is able to return to the Spanish economy in terms of output and employment. Thus, we offer an alternative approach to the perspective supported in current pension reforms, where pensioner benefits are mainly considered an excessive burden on working-age population that eventually limits economic growth. The results of our analysis clearly show the stabilizing effect of the expenditure on pensions during the recession, since it has not only contributed to the economic insurance of the retirees, but it has also helped to alleviate the negative trend in production and employment due to the collapse in demand of the Spanish economy.

*Key words***:** Pensions, income distribution, employment, households' consumption.

*JEL classification***:** G30, G31, G32.

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1. Introduction

Pension systems have been particularly affected by the imbalances of the financial and economic crisis started in 2008. Traditionally, it is considered that an increase in the percentage of GDP allocated to pensions would have dramatic consequences related not only to the sustainability of pension systems, but also to economic growth. This assumption seems to be the main argument behind all steps in current pension reforms, which denote a fundamental shift from guaranteeing the living standard of pensioners to the stability of the contribution rate (Logeay, Meinhardt, Rietzler, & Zwiener, 2009). In a broad sense, such reforms have introduced a set of austerity measures to limit the expenditure on pensions in order to ensure the financial sustainability of the system in the near future. Particularly, the reforming proposals in Spain seek to change or eliminate the annual pension adjustment according to the price index, to accelerate the gradual delay of the legal age of retirement and to link that age of retirement to the officially estimated life expectancy. In a practical way, these mechanisms entail applying a *factor of sustainability* with the aim of correcting automatically the risks associated with longevity and the macroeconomic key parameters.

However, the adoption of such measures leaves aside important aspects related to the adequacy of pensions. In fact, if governments cut social insurance plans, the flow of income to beneficiaries decreases and with it goes the stabilizing effect of their spending (Ghilarducci, Saad-Lessler, & Fisher, 2012), revealing the adverse consequences that a lower demand of pensioners may cause on the production and the employment. By allowing the elderly to meet their needs of consumption during the retirement, old-age pensions can be considered as transfers able to stimulate the production through the retirees' consumption instead of merely public spending that reduces the resources of an economy. In light of this, knowing how many jobs are depending on pensions and how much income returns to the economy from the pensioners' consumption will help us to assess the positive contribution of the PAYG scheme to the Spanish economy during the recession, which has given rise to the empirical analysis developed in this article.

The structure of this paper is as follows. In the second section, we introduce the main consequences of the Great Recession on the Spanish economy and how the

income and consumption of households have been affected. In the third section, we explain the model and data used to measure the value added and total labour requirements generated by households' consumption, as well as a summary of the main empirical results. Section four concludes.

2. Understanding the effects of the Great Recession in Spain

After having enjoyed an outstanding period of prosperity from 1997 to mid-2007, Spain officially fell into recession in the last quarter of 2008, when GDP showed a second negative quarterly rate of growth. Employment and investment declined substantially, resulting in a significant loss in wealth for many households. Although the recession was first interpreted as the consequence of a phenomenon caused by the real estate market in the United States, later analyses have shown that it was a far more complex effect (Alvarez, Luengo, & Uxó, 2013). Imbalances initially manifested in the financial market, later became a crisis of growth and employment, to evolve subsequently to a sovereign debt crisis in the euro zone. These three aspects are closely related and mutually reinforcing in a downward spiral that can be kept in time unless appropriate measures are taken (Shambaugh, 2012).

An excessive level of debt derived from an unsustainable pattern of economic growth before the crisis led to the so-called *debt trap* (Dejuán, 2013), in which agents demand capacity is very low as a result of the high percentage of revenues that should be spent on the payment of debt service. Although borrowing is initially a boost to aggregate demand, it can become a problem if the ratio debt to disposable income rises too much and the loss of lenders confidence limits borrowers refinancing.

This situation had two major consequences, on the one hand, it caused the stagnation of productive activity and thus the rise in unemployment, which constitutes one of the fundamental keys in this analysis. On the other hand, non-performing loans of private agents moved the debts of the private sector to the public sector through the emergency measures adopted by the euro zone governments, which brought on the previously mentioned sovereign debt crisis.

Spain has been no exception to this negative trend and has severely suffered the problems described above. Officially, the Spanish economy entered a period of

recession at the end of 2008, though prosperity ended in mid-2007, due mainly to the end of the boom in the construction industry. More specifically, the following factors were relevant (Febrero & Bermejo, 2013):

- Households were over-indebted in 2007, reaching 85% of GDP, when 10 years before their debt was 35% of GDP. Furthermore, the problems to refinance that debt worsened considerably with the significant credit reduction that occurred when the ECB decided to implement restrictive policies in which interest rates raised from 2% in November 2005 to 4.25% in July 2008.

- The Spanish economy maintained an unsustainable level of debt with the rest of the world, reaching figures close to 10% of GDP in years preceding the crisis, the largest in terms of GDP for OECD countries and the second largest behind the USA in absolute terms.

- The construction sector had acquired a quite disproportionate size as a consequence of the economic boom (Bielsa & Duarte, 2011; Naredo, 2004). Thus, more than 400,000 units of newly built housing were accounted in 2007 and this figure was increased in 200,000 units by 2008. Therefore, the housing market began to show signs of a significant saturation level. In 2007, the price of the square metre of a new home was 23% higher than in 2005 and 200% more than in 1997, but demand began to collapse because of the difficulties to access to credit and the reduction of household income. In consequence, such a decline in demand led to a lower level of activity in the construction sector which, due to its large weight on the Spanish economy, had a quite significant and specific effect on the labour market (García Montalvo, 2007).

In short, the accumulation of these imbalances during the pre-crisis economic prosperity triggered a process that was weakening the aggregate demand and, as a direct consequence, deteriorating the level of production, employment and household income. This fact reduced drastically private consumption, output and employment, closing the circle of the debt trap above mentioned. The solutions proposed to emerge from the crisis have continued the orthodox guidelines aimed at achieving budget balance and increasing savings through curbing public expenditure. In this recession context, household consumption analysis becomes

a relevant issue in order to assess how the welfare of different types of households has been affected by the crisis.

According to the Households Budget Survey (henceforth, HBS) of the Spanish Statistical Office, the average income of households decreased by 11.68% in real terms between 2006 and 2014. This loss has been distributed unequally between different types of households. Among the households which were most affected, we find those where the reference person is a self-employed person (-17.45%), an unemployed person (-19.46%) and, particularly, a receiver of other social benefits (-39.2%). On the contrary, households where the reference person was a pensioner were the only group showing a positive trend (12.83%). This points out that the increase in contributory pensions has meant a guaranteed income for their beneficiaries over a period of time during which the average income of households has been considerably reduced. Such economic insurance of retirees' households has become a relevant issue during the period of recession, when comparing their consumption expenditure with the rest of the households. Figure 1 (left) shows the annual change experienced by the spending on household consumption between 2006 and 2014 (compared to 2006 base year), where the turning point in 2007 clearly identifies the end of the period of economic boom and the beginning of the recession.

Figure 1. Households' consumption in Spain (real terms 2006=100). 2006-2014.
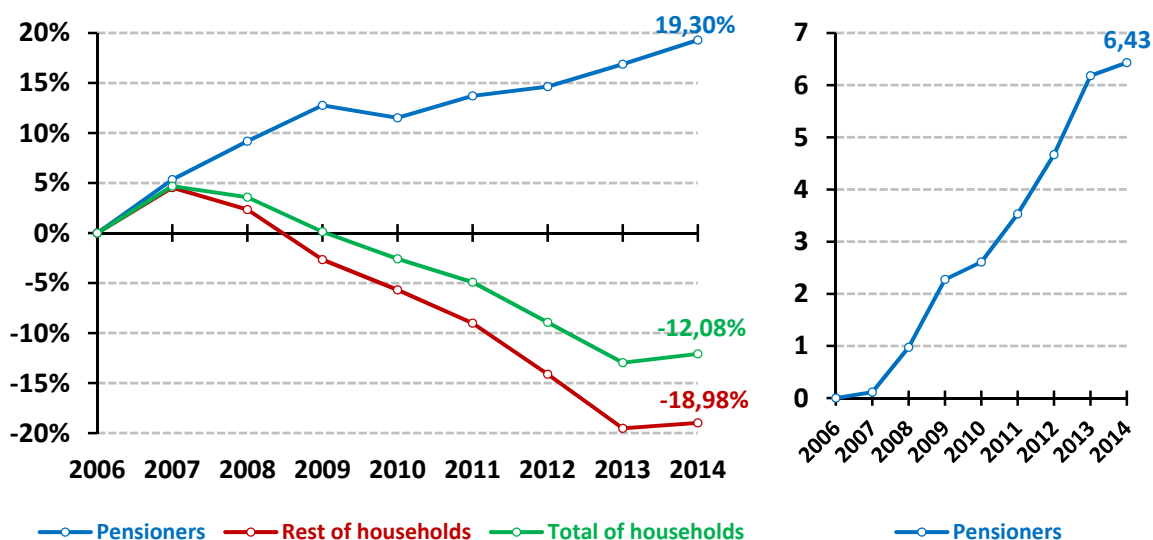
Source: Own elaboration from Households Budget Survey data (Spanish Statistics Office).

As it could be expected, significant losses of household income led to less household consumption, which declined by 12% between 2006 and 2014, despite a slight increase on the eve of the recession. However, not all households followed a similar trend, since those ones whose reference person was a pensioner increased their consumption by 19.3%, while in the rest of the households decreased by almost 19%. Although both the pensioners and non-pensioners' consumption baskets did not experience large variations between 2006 and 2014, the effect of the recession has substantially changed their share in consumption. The loss of income in all non-pensioner households (-16.3% on average, which has been mainly caused by unemployment) has led to an increase of roughly 6.5 percentage points in the share of pensioners household consumption over the total of households, which means a rise from 18% in 2006 to 24.5% in 2014 (Figure 1, right).

These circumstances should be taken into account when assessing the criteria of austerity that prevail in current pension reforms. The policy prescription encourages a systematic reduction of the costs associated with social protection, considering that a balanced government budget and less public debt will promote economic growth. However, if governments cut social insurance plans, the flow of income to beneficiaries decreases and with it goes the stabilizing effects of their spending (Ghilarducci et al., 2012). Therefore, assuming that public spending is an important constraint, having low spending should not be contemplated as the prime objective.

In this line, regarding measures adopted to pension systems, policymakers should bear in mind that a pension system is not successful just because it involves little government spending, a successful pension system is the one that achieves its goals of smoothing consumption and income replacement with an affordable cost. Reducing pension benefits in order to make the burden on active workers sustainable, means squeezing the incomes that fund the aggregate demand of retirees, which helps to maintain a substantial percentage of the labour force in their jobs and contributing to the Social Security.

All in all, if pension systems have been part of our economic model for so many years, it has not only been for the unquestionable social benefits that they have produced, but because they have also contributed to economic growth (Ferreiro &

Serrano, 2011). The industry sectors linked to pensioners' demand will increase their output level to the extent that the purchasing power of the elderly does remain adequate. In doing so, a higher level of production will bring more employment and, subsequently, more jobs will lead to a higher volume of income for Social security through the pay-roll tax. According to this view, public pension spending is supposed to maintain a positive relation to production and employment, since the pensioner benefits fund a growing demand for consumer goods and, in turn, more employment makes a pension system more sustainable. This question is the main reason behind our empirical analysis in the next section.

3. Income, employment and households' consumption

In line with the above mentioned issues, knowing how many jobs are depending on pensions and how much income returns to the economy from the pensioners' consumption will help us to assess the positive contribution of the PAYG scheme to the Spanish economy during the recession. Following Input-Output methodology, we first estimate how much production is required to match the demand by pensioners, and then we assess the employment and the value added depending on such level of production.

3.1. The model

We make use of an extended Input-Output model where the final demand includes exclusively the consumption of old-age state pensioners (OASP onwards).[1] Such level of exogenous consumption, under the Keynesian principle of effective demand, will lead to a higher level of production through the multiplier. This gain in production requires higher employment that generates, on the one hand, income for workers to purchase goods and services – the so-called endogenous consumption in the model – and, on the other hand, a source of income for the government in the form of taxes and social contributions that shall be used to pay off transfers to households (including those pensions that fund OASP consumption).

According to the traditional Input-Output methodology, this level of production $\mathbf{x}_R$ can be estimated as follows:

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[1] We only focus on old-age state pensions, leaving aside other revenues for old people or pensions for widows, orphans and disabled people.

$$\mathbf{x}_R \;=\; (\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w}_R)^{-1} \cdot \mathbf{c}_R \cdot y_R \cdot n_R \qquad (1)$$

Where $\mathbf{c_R}$ is a (column) vector containing the distribution of OASP consumption baskets, y_R is the average annual pension and n_R the number of OASP; $\mathbf{c}_{LR}$ is a (column) vector with the distribution of the workers consumption basket that has been purchased with $\mathbf{w}_R$, which is a (row) vector of wages linked to the labour requirements per unit of total output. In equation (1), $(\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w}_R)^{-1}$ is the extended inverse matrix that allows us to calculate the total effects on output $\mathbf{x}_R$ as a result of a particular variation in the exogenous final demand $\mathbf{c_R} \cdot y_R \cdot n_R$. Such effects are based on the interindustrial structure given by technical coefficients $\mathbf{A}$ and the induced consumption of workers employed in $\mathbf{x}_R$. Consequently, $\mathbf{x}_R$ is a (column) vector with the total domestic output by sector that is needed to produce the consumption basket that OASP can purchase with their pensions.

Once that $\mathbf{x}_R$ has been worked out, the value added $\mathbf{v}_R$ and employment $\mathbf{l}_R$ that are associated to pensioners' consumption can be obtained as follows:

$$\mathbf{l}_R = <\mathbf{l_d}> \cdot \mathbf{x}_R \;=\; <\mathbf{l_d}> \cdot (\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w}_R)^{-1} \cdot \mathbf{c}_R \cdot y_R \cdot n_R \qquad (2)$$

$$\mathbf{v}_R = <\mathbf{v_d}> \cdot \mathbf{x}_R \;=\; <\mathbf{v_d}> \cdot (\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w}_R)^{-1} \cdot \mathbf{c}_R \cdot y_R \cdot n_R \qquad (3)$$

where $<l_\mathbf{d}>$ and $<v_\mathbf{d}>$ are diagonal matrices obtained from vectors $\mathbf{l_d}$ and $\mathbf{v_d}$, including respectively the direct coefficients of employment and value added.

Therefore, equations (2) and (3) give us a disaggregated result of the total labour and income embodied in the OASP consumption baskets funded with the foregoing expenditure on pensions. By replicating these estimates for the observation period, in a further step, we develop a temporal analysis based on techniques of structural decomposition to quantify the contribution of the main factors that have caused the shifts in the total employment and value added.

Thus, the starting point is the equations (2) and (3) above. Focused on labour $\mathbf{l}_R{}^2$ and following (Skolka, 1989), the total shift in employment from base year 0 until

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[2] For the sake of simplicity, the methodology is described here only for employment $\mathbf{l}_R$, but the decomposition technique is equally valid for the subsequent analysis of the value added $\mathbf{v}_R$, being $\mathbf{v}_d$ the coefficients of value added per unit of output.

year 1 can be explained by changes related to inputs coefficients and changes in exogenous final demand $\mathbf{Y} = \mathbf{c}_R \cdot y_R \cdot n_R$ as follows:

$$\Delta\mathbf{l_R} = \mathbf{l}_{R1} - \mathbf{l}_{R0} = (\mathbf{l_{v1}} - \mathbf{l_{v0}}) \cdot \mathbf{Y}_{1/2} + \mathbf{l_{v1/2}} \cdot (\mathbf{Y}_1 - \mathbf{Y}_0) \qquad (4)$$

Where, using the terminology in (Pasinetti, 1973), $\mathbf{l_v} = <\mathbf{l_d}> \cdot (\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w_R})^{-1}$, is the vector of vertically integrated coefficients of employment, $\mathbf{Y}_{1/2} = \frac{1}{2}\mathbf{Y}_0 + \frac{1}{2}\mathbf{Y}_1$ and $\mathbf{l_{v1/2}} = \frac{1}{2}\mathbf{l_{v0}} + \frac{1}{2}\mathbf{l_{v1}}$.

Equation [6] can be further decomposed to identify additional changes in employment that has been originated by different effects related to the technology and to the final demand. Following (Han, 1995), changes in employment $\Delta\{\mathbf{l_d} \cdot (\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w_R})^{-1}\}$ due to technology can be decomposed into a *direct effect* related to the variation of sectoral employment coefficients $\Delta\mathbf{l_d}$ and *an indirect effect* caused by changes in the extended technical matrix $(\mathbf{I} - \mathbf{A} - \mathbf{c}_{LR} \cdot \mathbf{w_R})^{-1}$. In addition, this indirect effect can be split into changes related to the technical coefficients $\Delta(\mathbf{I} - \mathbf{A})^{-1}$ and changes related to the induced workers consumption $\Delta(\mathbf{c}_{LR} \cdot \mathbf{w_R} \cdot (\mathbf{I} - \mathbf{A})^{-1})^{-1}$.

Regarding the effects on final demand $\Delta\{\mathbf{c}_R \cdot y_R \cdot n_R\}$, according to the decomposition technique described in (Hoekstra & van den Bergh, 2002; Lin & Polenske, 1995), two factors can explain changes in employment: the *product mix effect*, which is caused by shifts in the composition of the pensioners' consumption basket $\Delta\mathbf{c_R}$, and a *final demand level effect*, i.e. effects associated to the growth of the overall level of final demand. In our analysis, this effect refers to changes in the average pension Δy_R and the number of pensioners Δn_R.

3.2. Main Results

This section provides information about the main results of this research. Firstly, we consider that a brief description of the main data sources used in this paper can be useful:

- The domestic Symmetric Input-Output Tables (henceforth, SIOT) for Spain has been obtained from the WIOD Database. This database is a project funded by the Research Directorate General of the European Commission, covering 27 EU countries and 13 other major countries in the world for the

period from 1995 to 2011. The Input-Output Tables are defined at basic prices and the information is disaggregated in 35 industries based on the NACE classification worldwide (Timmer et al., 2012).

- Consumption data for the different types of households considered in this exercise have been collected from the Household Budget Survey (HBS) carried out by the Spanish Statistics Institute. This database provides information on the amount and structure of households' expenditure according to the COICOP (Classification of Individual Consumption by Purpose), which is one of the classifications of the National accounts system. It is mainly used to classify transactions made between producers and the institutional sector of households. Moreover, the HBS also includes socio-economic data related to the standard of living, income, professional activity of the household reference person.

- It is important to note that there is not an official correspondence between HBS and SIOT. In order to provide comparable results between consumption purposes and products, HBS and SIOT have been aggregated in a basic classification of 20 sectors of activity according to the purpose of this particular investigation.

- The compensation and number of workers by productive sectors have been obtained from the National Accounting of the Spanish Statistics Institute.

In a first step of our analysis, vectors c_R of OASP consumption and c_{LR} of induced workers consumption in equation (1) are estimated. Given that final consumption appears in SIOT classified only in three levels, namely, Households, NPISH and Administration, we need a procedure to extract the information related to the consumption of pensioners from the consumption of the total number of households. To accomplish this, we used the above-mentioned statistics of the households' consumption contained in the HBS. By defining specific data filters related to age and earnings, we obtain the composition of the consumption basket of those households where a retirement pension is the main source of income and the reference person is aged 65 or older, as well as those households where the reference person is in employment. (Table 1).

Table 1. Households' and workers' consumption baskets. (2006-2011).

Sectors	c_R			c_{LR}		
	2006	2011	$\Delta_{2006-2011}$	2006	2011	$\Delta_{2006-2011}$
Agriculture and fishing	5.35%	5.23%	-0.12 p.p.	2.89%	2.94%	0.05 p.p.
Mining and quarrying	0.11%	0.08%	-0.03 p.p.	0.02%	0.02%	0.00 p.p.
Food, beverages and tobacco	22.15%	21.72%	-0.43 p.p.	15.80%	16.05%	0.25 p.p.
Clothing, textiles and footwear	7.47%	6.10%	-1.37 p.p.	8.25%	7.70%	-0.55 p.p.
Chemicals and intermediate products	3.08%	3.62%	0.53 p.p.	2.22%	2.30%	0.09 p.p.
Machinery and electrical equipment	2.17%	3.10%	0.93 p.p.	2.95%	3.67%	0.72 p.p.
Furnishing, accessories and recycling	5.29%	4.60%	-0.70 p.p.	6.43%	5.37%	-1.06 p.p.
Electricity, gas and water supply	8.96%	9.49%	0.53 p.p.	8.65%	9.54%	0.90 p.p.
Construction	2.05%	2.06%	0.01 p.p.	1.10%	0.94%	-0.16 p.p.
Sale and repair of motor vehicles and fuels	5.68%	4.58%	-1.10 p.p.	10.77%	7.48%	-3.30 p.p.
Maintenance services	0.75%	0.59%	-0.16 p.p.	0.52%	0.60%	0.08 p.p.
Restaurants and Hotels	8.66%	8.09%	-0.56 p.p.	13.38%	12.59%	-0.79 p.p.
Transport	1.12%	0.94%	-0.18 p.p.	1.54%	1.49%	-0.05 p.p.
Post and telecommunications	3.04%	3.76%	0.72 p.p.	3.22%	4.13%	0.92 p.p.
Insurance and Financial services	4.12%	4.62%	0.50 p.p.	3.48%	3.71%	0.23 p.p.
Housing and real estate	3.40%	4.14%	0.74 p.p.	4.17%	6.12%	1.96 p.p.
Business services	1.79%	0.87%	-0.92 p.p.	1.45%	0.85%	-0.60 p.p.
Education	0.28%	0.24%	-0.05 p.p.	1.30%	1.64%	0.34 p.p.
Health and social work	4.03%	4.87%	0.83 p.p.	2.71%	3.36%	0.65 p.p.
Community, recreation and personal services	10.48%	11.30%	0.82 p.p.	9.16%	9.50%	0.34 p.p.
y_R Average old-age pension (euros)	9,861	11,077	**12.3%**			
n_R number of OASP (thousands)	4,501	4,871	**8.2%**			
Total consumption (10⁶ euros)	**44,387**	**53,954**	**21.5%**			

Source: Own elaboration from HBS data (INE) and WIOD Database.

The results above have been obtained taking into account three important requirements: (i) the deduction of VAT, since we are interested in the expenditure of workers and pensioners in basic prices to make it compatible with the TSIO data; (ii) the discounting of the imputed rents included in the values of housing and real estate, since the nature of this expenditure does not put in motion any amount of labour linked to this activity; and (iii) the monetary values in SIOT and HBS are expressed in real terms (base year 2006) and have been deflated by using constant prices tables extracted from the WIOD database.

Broadly speaking, the pensioners' consumption basket reflects a distribution (defined by c_R) mainly focused on essential goods and services to cover basic necessities –food, beverages and tobacco together with health and social work make up approximately a quarter of the total expenditure for the elderly–, whilst workers' households show a higher level of consumption in the vehicles sector

and hotels. In light of these results, pensions have been the key to guarantee the purchasing power of old-age households, allowing the elderly to meet their spending needs during retirement. From a macroeconomic perspective, this can be considered a source of additional demand that is able to bring into production resources which, otherwise, would have remained idle (Cesaratto, 2002).

Once the consumption baskets of workers and pensioners have been estimated, Table 2 shows the level of production (disaggregated by sectors) that is needed to match the OASP consumption, as well as the value added and the employment associated to such level of production. The results have been obtained by applying firstly equation (1) to find out the output x_R and then, equations (2) and (3) for the value added v_R and the employment l_R respectively.

Table 2. Output, value added and labour depending on pensioners' consumption. 2006-2011.

Sectors	x_R			v_R			l_R		
	2006	2011	$\Delta_{2006-2011}$	2006	2011	$\Delta_{2006-2011}$	2006	2011	$\Delta_{2006-2011}$
Agriculture and fishing	6.146	7.186	16,92%	3.540	4.129	16,63%	118.815	125.051	5,25%
Mining and quarrying	326	242	-25,66%	130	88	-32,16%	2.440	2.079	-14,79%
Food, beverages and tobacco	17.391	20.780	19,49%	3.529	4.372	23,88%	82.871	88.408	6,68%
Clothing, textiles and footwear	5.965	5.353	-10,26%	1.709	1.555	-9,05%	61.774	49.953	-19,14%
Chemicals and intermediate products	9.752	11.910	22,12%	2.725	2.995	9,91%	47.426	41.150	-13,23%
Machinery and electrical equipment	3.627	4.522	24,69%	907	1.123	23,87%	14.456	12.145	-15,99%
Furnishing, accessories and recycling	4.155	4.247	2,19%	1.235	1.213	-1,73%	67.524	80.122	18,66%
Electricity, gas and water supply	9.323	12.640	35,59%	3.153	4.269	35,43%	15.373	22.849	48,63%
Construction	4.181	4.515	7,99%	1.419	1.696	19,55%	34.208	29.795	-12,90%
Sale and repair of motor vehicles and fuels	5.686	5.563	-2,15%	2.410	2.390	-0,82%	54.742	49.192	-10,14%
Maintenance services	6.212	8.399	35,20%	3.675	5.063	37,76%	119.065	128.809	8,18%
Restaurants and Hotels	6.775	7.714	13,86%	3.977	4.454	11,99%	74.655	86.067	15,29%
Transport	4.465	4.848	8,58%	1.738	1.943	11,75%	37.029	41.033	10,81%
Post and telecommunications	3.660	5.227	42,82%	1.826	2.584	41,49%	13.952	18.343	31,48%
Insurance and Financial services	4.912	6.209	26,42%	3.235	3.751	15,95%	29.962	36.999	23,49%
Housing and real estate	2.594	4.022	55,05%	13.034	19.402	48,86%	29.605	38.487	30,00%
Business services	5.569	7.009	25,86%	3.129	3.973	26,99%	94.214	119.021	26,33%
Education	543	716	31,96%	467	616	31,85%	10.675	14.205	33,06%
Health and social work	2.611	3.918	50,06%	1.686	2.555	51,53%	41.605	54.944	32,06%
Community, recreation and personal services	7.860	10.242	30,31%	4.967	6.415	29,14%	137.203	171.247	24,81%
Total [1]	111.752	135.264	21,04%	58.493	74.587	27,52%	1.087.594	1.209.900	11,25%

Notes: (1) Monetary values in million euros. Constant prices (Base 2006).
Source: Own elaboration from HBS data (INE) and WIOD Database

The last row in Table 2 reflects that during the crisis of 2008 the production of goods and services to satisfy the pensioners' consumption demand increased 21% in real terms. It has been a widespread gain, where an outstanding rise of 55% in the sector of housing and rents highlights especially, together with other

increases of 50% in health and social services or 42.8% in post and telecommunications. However, it has also declined in the industrial sectors as manufacturing of clothing and footwear (-10.3%) and extractive industries (-25.7%). This increase in production has triggered two positive effects in terms of economic growth: a raise by 27.5% in the value added and by 11.25% in the number of direct and indirect jobs. Table 3 shows the value added generated by the production of the pensioners' basket of consumption split into wages and salaries of the workers, the benefit of the companies and the amount corresponding to the social contributions and indirect taxes on production.

Table 3. Value added generated by OASP consumption. (2006-2011).

	Monetary Value (10^6 €)			Income distribution		
	2006	**2011**	**Δ₂₀₀₆₋₂₀₁₁**	**2006**	**2011**	**Δ₂₀₀₆₋₂₀₁₁**
Salaries of workers	18,951	23,152	22.16%	32.40%	31.04%	-1.36 p.p.
Social Security Contributions	5,395	6,351	17.73%	9.22%	8.52%	-0.71 p.p.
Gross Operating Surplus	33,786	44,117	30.58%	57.76%	59.15%	1.39 p.p.
Indirect taxes on production	360	966	168.56%	0.61%	1.30%	0.68 p.p.
V_R	**58,492**	**74,587**	**27.51%**			
Spending on pensions	**44,387**	**53,954**	**21.55%**			
V_R over Spending on pensions	**31.8%**	**38.2%**				

Note: Monetary values in real terms. Million euros of 2006.
Source: Own elaboration from HBS data (INE) and WIOD Database

The results show, on the one hand, that the income distribution generated during the recession has remained constant at roughly 1% for indirect taxes, 58% for the gross operating surplus, 32% in wages and 9% in social contributions. On the other hand, what is more significant for the purpose of this investigation, the total value added in the production exceeds the previous spending on pensions during the whole period considered, ranging from 31.8% in 2006 to 38.2% in 2011.

Furthermore, if we focus exclusively on the amount of added value that has been allocated to social contributions and indirect taxes, the outcomes above reveal that during 2006-2011, 12% on average of the previous expenditure on pensions returned directly to the system. Such result represents an amount on average equivalent to 6.13% of the total contributions of employees to Social Security and 0.71% of GDP during 2006-2011.

Regarding the employment, as mentioned before, Table 2 shows that during the period of crisis the number of jobs required to match the pensioners' consumption

demand increased by 11.25%. At a sectoral level, a general increase of employment is observed, especially in those sectors of services and those ones related to basic needs, but the rise of 48.6% in the energy sector and 18.7% in furnishing, accessories, and recycling is also significant. However, Table 2 also reflects negative values, mainly in the industrial sectors of sale and repair of motor vehicles and fuels (-10.1%), construction (-12.9%), machinery and electrical equipment (-16%), chemicals and intermediate products (-13.2%), clothing, textiles and footwear (-19.1%) and mining and quarrying (-14.8%), which proves that the secondary sector has been the one where the recessive effect of the aggregate demand has caused a deeper impact.

All above results prove the stabilizing effect of pensions on the labour market, since the benefits received by pensioners have been applied to sustain and improve a level of demand that subsequently has returned to the system as production and jobs. This fact has helped to alleviate the negative trend in consumption and employment followed by the rest of the households. Such negative trend in employment is described in the left side of Table 4.

Table 4. Total employment *vs* employment related to pensioners' consumption baskets. (2006-2011).

Sectors	l_{TOTAL}			$\%l_R s/l_{TOTAL}$		
	2006	2011	$\Delta_{2006-2011}$	2006	2011	$\Delta_{2006-2011}$
Agriculture and fishing	821.300	723.200	-11.94%	14,47%	17,29%	2.82 p.p.
Mining and quarrying	46.500	33.100	-28.82%	5,25%	6,28%	1.03 p.p.
Food, beverages and tobacco	424.700	398.100	-6.26%	19,51%	22,21%	2.70 p.p.
Clothing, textiles and footwear	236.600	162.700	-31.23%	26,11%	30,70%	4.59 p.p.
Chemicals and intermediate products	1.244.600	944.321	-24.13%	3,81%	4,36%	0.55 p.p.
Machinery and electrical equipment	523.000	420.200	-19.66%	2,76%	2,89%	0.13 p.p.
Furnishing. accessories and recycling	377.500	321.351	-14.87%	17,89%	24,93%	7.04 p.p.
Electricity. gas and water supply	85.500	105.849	23.80%	17,98%	21,59%	3.61 p.p.
Construction	2.551.200	1.369.300	-46.33%	1,34%	2,18%	0.84 p.p.
Sale and repair of motor vehicles and fuels	330.700	331.914	0.37%	16,55%	14,82%	-1.73 p.p.
Maintenance services	2.536.300	2.495.086	-1.62%	4,69%	5,16%	0.47 p.p.
Restaurants and Hotels	1.223.600	1.231.200	0.62%	6,10%	6,99%	0.89 p.p.
Transport	856.300	839.192	-2.00%	4,32%	4,89%	0.57 p.p.
Post and telecommunications	152.000	154.126	1.40%	9,18%	11,90%	2.72 p.p.
Insurance and Financial services	383.100	375.500	-1.98%	7,82%	9,85%	2.03 p.p.
Housing and real estate	183.100	178.600	-2.46%	16,17%	21,55%	5.38 p.p.
Business services	2.048.800	2.199.860	7.37%	4,60%	5,41%	0.81 p.p.
Education	944.900	992.100	5.00%	1,13%	1,43%	0.30 p.p.
Health and social work	1.194.900	1.301.900	8.95%	3,48%	4,22%	0.74 p.p.
Community. recreation and personal services	2.561.500	2.660.500	3.86%	5,36%	6,44%	1.08 p.p.
Total	**18,726,100**	**17,238,100**	**-7.95%**	**5.81%**	**7.02%**	**1.21 p.p.**

Source: Own elaboration from HBS data (INE) and WIOD Database.

Table 4 also shows, at the right side, the share of the employment associated to the pensioners' consumption with respect to total employment. The combined effect of a negative trend in the total production of the economy together with a positive trend in the production associated to the pensioners' consumption, resulted in a larger share of workers linked to the pensioners' demand on total employment. As the data at the aggregate level show, the employment related to goods and services demanded by pensioners was 5.81% of the total number of workers in 2006, whilst it reached 7.02% in 2011. All branches of activity experienced an important rise (1.21 p.p. at the aggregate level), with the exception of the sector of sale and repair of motor vehicles and fuels (-1.73 p.p.).

The rationale behind the variation in the value added and employment previously shown relies on the imbalances that triggered the recent economic crisis. But: what structural components have been the driving forces responsible for such changes and what has been the share of these changes during the recession? Firstly, Table 5 below shows the structural decomposition for the value added generated by the pensioners' consumption demand.

Table 5. Structural Decomposition of the value added generated by pensioner's consumption. (2006-2011)

$v_R = v_d \cdot (I - A - c_{LR} \cdot w_R)^{-1} \cdot < c_R \cdot y_R \cdot n_R >$		
$v_{R\ 2006}$	58,493 (million €)	
TOTAL Δv_R	**27.52%**	
Technological change $\Delta\{v_d \cdot (I - A - c_{LR} \cdot w_R)^{-1}\}$	2.63%	
Value added per unit of output Δv_d	-3.04%	
Changes in intermediate consumption $\Delta(I - A - c_{LR} \cdot w_R)^{-1}$	5.67%	
Changes in technical coefficients $\Delta(I - A)^{-1}$		1.56%
Changes in induced consumption of workers producing x_R $\Delta(c_{LR} \cdot w_R \cdot (I - A)^{-1})^{-1}$		4.11%
Changes in consumption of pensioners' households $\Delta\{c_R \cdot y_R \cdot n_R\}$	24.89%	
Product mix effect Δc_R	2.66%	
Level effect $\Delta\{y_R \cdot n_R\}$	22.23%	
Changes in number of pensioners' households Δn_R		8.99%
Changes in the average pension Δy_R		13.24%
$v_{R\ 2011}$	74,587 (million €)	

Source: Own elaboration from HBS data (INE) and WIOD Database.

The results indicate that the increase of 27.52% observed in the total value added has been mainly due to a rise by 24.89% in the aggregate demand, as a result of a higher level of pensioners' consumption, that has been slightly strengthened by an increase of 2.63% due to changes in the technological factors. The most important effect on the shift of the added value has been produced by the increase in the number of pensioners and the value of the average pension. The increase in the benefits of pensioners' households is responsible for the 13.24% of the income variation, whilst the increase in the number of pensioners over 65 contributed 8.99%. Both factors are combined in the effect level described in the methodological section, which herein denotes a variation of 22.23% in the final demand (positive and particularly relevant in this analysis).

Finally, Table 6 below presents the variation of the total employment associated to consumption of pensioners' households from 2006 to 2011. The results show that two opposing effects can explain the increase by 11.07% in the number of jobs: an increase by 18.95% in the exogenous final demand and a decrease by 7.88% due to changes observed in the technology.

Table 6. Structural Decomposition of the employment associated to pensioner's consumption. (2006-2011)

$l_R = l_d \cdot (I - A - c_{LR} \cdot w_R)^{-1} \cdot < c_R \cdot y_R \cdot n_R >$		
$l_{R\ 2006}$	**1,087,594**	
TOTAL Δl_R	**11.25%**	
Technological change $\Delta\{l_d \cdot (I - A - c_{LR} \cdot w_R)^{-1}\}$	**-7.93%**	
Employment per unit of output Δl_d	**-9.83%**	
Changes in intermediate consumption $\Delta(I - A - c_{LR} \cdot w_R)^{-1}$	**1.90%**	
Changes in technical coefficients $\Delta(I - A)^{-1}$		2.05%
Changes in induced consumption of workers producing x_R $\Delta(c_{LR} \cdot w_R \cdot (I - A)^{-1})^{-1}$		-0.15%
Changes in consumption of pensioners' households $\Delta\{c_R \cdot y_R \cdot n_R\}$	**19.18%**	
Product mix effect Δc_R	**-1.58%**	
Level effect $\Delta\{y_R \cdot n_R\}$	**20.76%**	
Changes in number of pensioners' households Δn_R		8.39%
Changes in the average pension Δy_R		12.37%
$l_{R\ 2011}$	**1,209,900**	

Source: Own elaboration from HBS data (INE) and WIOD Database.

More specifically, changes related to the exogenous consumption were produced by the increase in the number and the average income of pensioners' households. The maintenance and improvement of the purchasing power of the elderly (mostly by pensions) is responsible for 12.3% of changes in employment, whilst the increase in the number of old-age households has contributed in 8.35%. Both factors are combined in the so-called level effect, which refers to the variation (positive and especially relevant for this particular case) of the final demand in absolute terms. However, changes in consumption due to the product mix effect cause a negative impact on the total number of jobs (although of minor importance, -1.69%). This reduction occurs as a consequence of a change in the consumption behaviour of old-age consumers from 2006 to 2011. The difference in employment due to technological effects (-7.88%) has been further decomposed into changes produced by labour productivity growths (-8.81%) and changes in the intermediate consumption (0.93%), which are also explained by the variation in the technical coefficients included in matrix A (1.96%) and the induced consumption of workers employed in the output to match the final demand (-1.03%).

4. Conclusions

Considering that contributory pensions are the main source of income for nearly 90% of old-age households, this paper has shown the important stabilizing effect of the Spanish pension system during the crisis. After a decade of prosperity, a series of financial and fiscal imbalances have led to a significant collapse in effective demand. As a consequence of this, we are caught in a downward spiral, in which lower household consumption raises unemployment rates and the risk of becoming unemployed hinders consumption. In this recession context, pensions not only have guaranteed the purchasing power for pensioners' households (what contributed to achieving the basic objective of economic insurance that is traditionally attributed to pension systems), but they have also financed the consumption demand by pensioners, thus helping to alleviate the negative trend in production and employment followed by the rest of households.

Both employment and valued added represent the positive contribution of pension spending to the economic system. In order to shed some light onto the debate about the sustainability of pension systems, we have performed an analysis to find

out whether those potential benefits are able to overcome the burden associated to the expenditure on pensions. Using Input-Output methodology and techniques of structural decomposition, we have carried out an analysis which results show that the consumption of the pensioners' households generated 1,087,594 jobs in 2006 (5.8% of the total employment) and 1,209,900 in 2011 (7% of the total employment). This means around 122.300 more jobs that contributed to alleviate the negative trend in the total employment during this period of time (-1.49 million people). Furthermore, the value added generated in the production of the pensioners' consumption increased from 58,493 million euros in 2006 to 74,587 million euros in 2011, whilst the expenditure on pensions was 44,387 million euros in 2006 and 53.954 million euros in 2011. These results have led us to conclude that the income returned to the economic system from the demand of pensioners was 31.7% (in 2006) and 38.2% (in 2011) larger than the previous spending on pensions, distributed among benefits for companies (58%), salaries for workers (32%) and Social Security contributions plus taxes on production (10%), all percentages on average for 2006-2011.

In summary, Figure 2 provides a measurement of the economic return depending on previous pension expenditure during the recession. The results show that every thousand euros allocated to pensions in 2006 returned 1.32 thousand euros to be distributed to the economy and around 24 jobs, whilst in 2011 the value added amounted to 1.38 euros and put in motion nearly 22 workers.

Figure 2. Economic return on pension expenditure. (2006-2011).
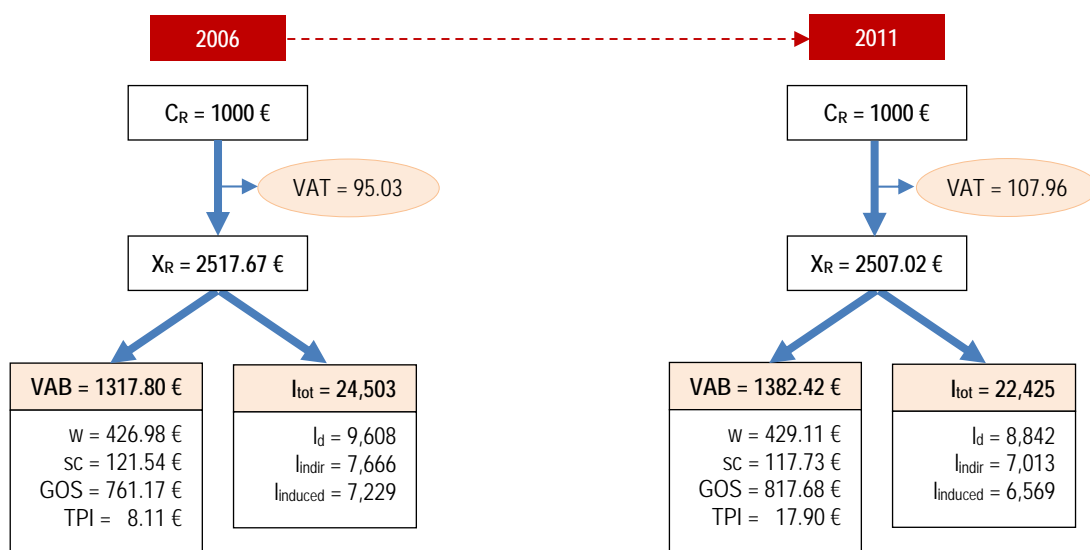
Source: Own elaboration

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