



## Rethinking social welfare in Spain: a basic pension for everyone

J. Iñaki De La Peña Esteban & Noemí Peña-Miguel

To cite this article: J. Iñaki De La Peña Esteban & Noemí Peña-Miguel (2018) Rethinking social welfare in Spain: a basic pension for everyone, Economic Research-Ekonomska Istraživanja, 31:1, 1737-1757, DOI: [10.1080/1331677X.2018.1480402](https://doi.org/10.1080/1331677X.2018.1480402)

To link to this article: <https://doi.org/10.1080/1331677X.2018.1480402>



© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 20 Nov 2018.



Submit your article to this journal [↗](#)



View Crossmark data [↗](#)

# Rethinking social welfare in Spain: a basic pension for everyone

J. Iñaki De La Peña Esteban<sup>a,b</sup>  and Noemí Peña-Miguel<sup>a,b</sup> 

<sup>a</sup>Social Provisions Research Group, Unit Associated with POLIBIENESTAR (Social Welfare Policy), University of the Basque Country (UPV/EHU), Leioa, Bizkaia, Spain; <sup>b</sup>Department of Financial Economics I, Faculty of Economics and Business, University of the Basque Country (UPV/EHU), Bilbao, Vizcaya, Spain

## ABSTRACT

This study proposes a general aid system based on a mixed financing model in Spain. To that end, it proposes that the different aids available be merged into a single scheme to avoid duplications. The proposed financial model factors in the tax base of the unified aids on the one hand and the contributory part of social insurance on the other. The main conclusion is that the proposal is feasible, so long as a reform of the contributory aid system is undertaken.

## ARTICLE HISTORY

Received 28 March 2017  
Accepted 22 May 2018

## KEYWORDS

Public pensions; welfare state; public finance; social security

## JEL CLASSIFICATIONS

I38; H53; H55; D63

## 1. Introduction

In most countries social welfare insurance was introduced first for industrial workers with low wages and later extended to agricultural workers, service-sector workers and freelancers (ILO, 2002). Currently there are also networks of aid set up by local authorities (at regional, provincial and municipal levels) for the needy, and the system covers most residents and non-residents in a welfare state.

Systems of this kind are not usually homogeneous across the whole of a country. This may result in major problems that limit their effectiveness in reducing inequality and poverty. It is precisely this problem that the World Bank has sought to tackle in switching from a three-pillar social welfare protection system (a ‘first-pillar’ contributory system; a mandatory ‘second pillar’ that is essentially an individual savings account; and voluntary ‘third-pillar’ arrangements that can take the form of individual, employer-sponsored, defined-benefit or defined-contribution systems) to a five-pillar system (Holzmann & Hinz, 2005) by adding:

- a ‘zero pillar’ based on non-contributory or social assistance aids, and
- an additional pillar based on family or informal transfers.

**CONTACT** J. Iñaki De La Peña Esteban  [jinaki.delapena@ehu.es](mailto:jinaki.delapena@ehu.es)

© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

The role and ability of each pillar to provide poverty relief, a smoothing of consumer spending and redistribution from (lifetime) rich to those at risk of old-age poverty depend not only on the design and associated incentives and disincentives but also on administrative capability.

First, basic income support (a zero pillar) to alleviate old-age poverty should be part of any complete retirement system. Financing in low-income countries will be a challenge and needs to be assessed against the competing demands of other vulnerable groups, such as children, youth and the disabled, but the challenges of implementation are equally strong and require close attention.

The first pillar is the typical public pension scheme funded from social security contributions, with perhaps some reserves, with defined benefits or non-financial defined contributions, under public management and possibly with an additional redistributive goal. Initially, this category comprises different plans for various occupations (such as civil servants, private-sector employees, independent workers or farmers), with a trend toward harmonisation between the schemes as development occurs and labour mobility becomes increasingly important. Its essential feature is to provide a minimum level of longevity insurance for retirees, funded through intergenerational transfers.

A mandatory second pillar, if it is effectively designed and operated, can better insulate individuals from political risks. Participants are subject to financial market volatility, the risk of high transaction costs and demographic risks if they require some mandatory annuitisation. The third pillar offsets rigidities in the design of other systems but entails financial and agency risks as a result of the private management of assets. The third pillar comprises voluntary and prefunded pension plans (occupational or personal plans) established and regulated to ensure a clear retirement objective. Depending on the form of the benefits, the third pillar can also provide longevity insurance, but its provision would rely on private-sector institutions.

In Europe and elsewhere, the second pillar refers to occupational pension plans and the third refers to personal pension plans (whether mandated or voluntary); in the Americas and elsewhere, the second pillar refers to mandated plans and the third pillar refers to voluntary plans (whether occupational or personal).

The fourth pillar is added because a large part of consumer spending in retirement may be derived from sources that are not formally defined as pensions, such as home ownership, interfamily transfers and personal savings accounts.

In addition, multipillar schemes with substantial funded pillars may also have effects at the level of individual welfare, with five main outcomes being possible in mature systems: diversification, political isolation, choice, rate of return and lower excess taxation. The advantages of diversification have been discussed and comprise the diversification of risk at economic, demographic and political levels, both nationally and internationally (World Bank, 1994).

Like the World Bank, the European Parliament encourages states to guarantee the basic financial security of their populations (European Parliament, 2010). In June 2012 the International Labour Organisation (ILO) also issued a recommendation that urged the governments of EU Member States to:

1. establish and maintain, as applicable, social protection floors as a fundamental element of their national social security systems; and

2. implement social protection floors within strategies for the extension of social security that progressively ensure higher levels of social security to as many people as possible, guided by ILO social security standards.

The ILO (ILO, 2012) currently proposes a basic level of social protection, recognising that social security is a vital public social policy tool for preventing and reducing poverty, inequality, exclusion and social insecurity.

In many developed countries and some transition economies in Europe and Central Asia, mandatory defined-contribution social security systems form the first pillar of the system proposed by the World Bank. A 'zero pillar' has also been introduced that deals with minimum requirements for survival and takes into account the demographic and economic circumstances of each country (Cichon & Hagemeyer, 2007; Kulke, 2007).

This could be guaranteed through minimum aid levels (non-contributory benefits) subject to minimum requirements for households, or through various schemes such as the 'minimum income for integration' and financial aids for disadvantaged groups managed by local authorities (at Regional Autonomous Community or municipal level) in Spain. However, although a network of financial aid exists, there is no single coverage system to ensure that all citizens receive the benefits needed to guarantee a minimum standard of living. In Spain this is a major shortcoming: the fact that the system was not designed as a single whole means that there are major problems of coordination which significantly constrain its effectiveness in reducing inequality and poverty (Laparra, 2011).

A 'basic social aid' (BSA) that brings together all these aids in a single scheme would do away with the inconsistencies and shortfalls observed in many current schemes, which result in disparities in the degree of protection received by different segments of the population. Such minimum basic social coverage would need to be backed up by a financing structure capable of guaranteeing its viability and sustainability over time in financial and social terms. It needs to reach most of the population and cover their basic necessities. Setting up a level of social protection sufficient to cover basic necessities would of course entail increasing the level of social assistance provided by the social security system, and this in turn would mean redefining the amounts payable through contributions. This redefinition is of vital importance because it has implications for sources of financing: public funding from taxation to cover the social assistance part and contributions from employers and workers to fund the contributory part.

The rest of the paper is structured as follows. [Section 2](#) reviews the literature on basic social aids, their definition, amounts and financing. [Section 3](#) proposes a general basic aid system backed by a mixed financing model. [Section 4](#) deals with the application of the model to Spain, indicating a basic social aid determined according to basic necessities and drawing up forecasts under three different scenarios. The last section offers conclusions and suggestions for future research.

## **2. Literature review on basic aids and financing social aids from tax income**

The idea of basic aids is not new: there are already minimum aids for various forms of coverage (e.g., retirement, unemployment and invalidity), minimum income schemes and proposals for general minimum income.

## **2.1. Basic aids: definition and amount**

In the European Union there are many different approaches to general minimum income (GMI) benefits under different names in different countries.

Usually they are a combination of different monetary allowances with social inclusion measures (Kazepov, 2011) such as compulsory training for labour-market integration (Germany, Austria, Italy, Luxembourg and Portugal) (Clegg, 2013). Although other aid is available, GMI benefits are paid as a last resort in Belgium, Denmark, Finland and Ireland, and are compatible with other monetary allowances at municipal level (Martínez, 2010; MISSOC, 2011). In southern Europe, Portugal, Italy, Spain and Greece have had minimum aids since the 1990s (Gough, 1996; Gough et al., 1997), but both Portugal and Italy have now introduced national GMI schemes. In Spain, Italy and Greece, local authorities provide minimum income supplements (Rhodes, 1996), although Greece has also set up a pilot programme for a national-level GMI (Lalioti, 2016; Matsaganis, 2013).

Perhaps the most universal of GMI schemes is the Alaska oil dividend (APFC, 2009), which is paid to all residents and funded from oil production in the region. However, this dividend is also paid to residents who are not short of resources. It is more of a remuneration for residency than a social benefit. The schemes most widely used are those aimed at specific needy groups such as the Canadian universal pension for all Canadian citizens or legal residents over 65 (Service Canada, 2012) and the universal citizen's pension in the Federal District of Mexico for all over 68s, both of which are paid regardless of the socioeconomic characteristics of the recipients (Medina, 2009). Other programmes include the Guaranteed Minimum Income Programme and Basic Low Income schemes in Brazil, under which the same family can receive aid from different programmes.

Palacios and Knox-Vydmanov (2014) point out that new social pensions clearly marked a turning point in terms of coverage and adequacy of systems; even if the focus continued to be on the 'deserving poor', the introduction of social pensions represented an important symbolic shift in these early social protection systems. Moreover, the increasing popularity of social pensions has clearly been a response to the failure of contributory pensions to expand coverage beyond a small portion of the population. This frustration has led the ILO (2012) to shift its focus increasingly from traditional social insurance to the concept of a 'floor' of social protection.

Although support for a social protection floor has been growing from a range of actors (the G20, European Union, the United Nations), no such floor exists at present. Instead there are different social aids or benefits with different coverages. The amounts paid in them tend to depend on political agreements, which reflect the ideologies of the governing parties (Figari, Matsaganis, & Sutherland, 2013), the financial resources available to the government or regional authorities and whether other supplementary or replacement benefits (Noguera, 2002) financed by different organisations (the state, the municipal authorities, etc.) are available. However, some researchers have put forward the idea of single universal benefit payments with amounts that vary in line with factors such as place of residence, age and family circumstances (Pinilla, 2004, 2006; Sanzo, 2011). Moreover, parameters of social pension design vary considerably in issues such as age of eligibility, citizenship and residency

criteria, and whether they are means-tested. The adequacy of benefit levels also varies widely, and some countries vary the benefit level for different categories of people, such as married couples or older ages (Palacios & Knox-Vydmanov, 2014).

The amount payable may be based on an external wage benchmark (such as a regularly set income level such as the statutory minimum wage or the Spanish public multiple-effect income indicator (IPREM)) although the purpose of the pension benefit – i.e., to guarantee a minimum level of social protection – should be taken into account.

In this context, the federal government of Finland is currently conducting an experiment on the effects of a basic income (individual, unconditional, universal income) on unemployed citizens which began in January 2017 and will conclude in December 2018. Prior to the launch of the Finnish experiment, the provincial government of Ontario had already announced its plans to test a type of unconditional guaranteed income with the aim of finding ways to reshape the social security system in response to changes in the labour market. The sample group for the Finnish experiment consists of 2000 individuals randomly selected from among Finns between the ages of 25 and 58 who were receiving unemployment benefits in November 2016. These 2000 participants receive unconditional monthly cash payments of €560, an amount approximately equal to that provided by Finland's existing programmes of unemployment assistance. Researchers such as Olli Kangas have recommended expanding the experiment in future years to test different models of basic income or broaden the target population. This, however, will depend on budgetary decisions by the federal government and on the results of the experiment.

Leading authors (Coulter et al., 1992; Regidor et al., 2003) have asserted that the biggest difficulty in setting amounts is the fact that in the real world individuals have widely differing characteristics.

1. They live in households of different sizes and types, which means that they must be acknowledged as having different 'necessities'.
2. Some resources depend directly on the activities of individuals and others are beyond their control (Roemer, 1998), e.g., the gender and age of the main breadwinner (Roemer et al., 2003).
3. There are also differences that go beyond prices, such as sociodemographic and financial differences between otherwise identical individuals, which are currently covered by a wide variety of minimum income schemes. In this regard there is a problem of equity between territories in the trend over time in minimum income benefits, just as there is between one country and another in Europe (Beramendi, 2012).

Most studies of social pension benefits use aggregate public spending figures (Figari, Matsaganis & Sutherland, 2013), although others use models based on family units (the 'family approach') (Adema, 2006; Frazer & Marlier, 2009; Gough et al., 1997; Immervoll, 2012; Nelson, 2010; Van Mechelen et al., 2011). However, the latter have limitations due to the different types of family that can exist.

Following the necessity-based and family approaches, Peña-Miguel, De La Peña, & Fernández-Sainz (2015) define the BSA as a single financial allowance paid each year to each individual that is sufficient to meet the minimum requirements for

survival in line with basic necessities for subsistence, family situation and place of residence.

The basic necessities for subsistence – food, clothing and footwear, accommodation and public transport (Clark, 2005) – are hard for people who live below the poverty line to obtain (Guio, 2005). The make-up of those necessities varies little from one country or region to another (Frazer & Marlier, 2009). The items involved form part of the so-called ‘reference budget’, which is the sum cost of a widely accepted list of basic items required by the heads of a range of households to maintain an acceptable standard of living (Storms & Van der Bosch, 2009). These items are a standard component of Household Budget Surveys (HBS) and can be associated with and estimated according to family circumstances and place of residence.

**2.2. Models of financing social aids from tax revenues**

The funding earmarked for the payment of social pensions can come from two sources: taxes and social contributions. There are proposals for financing other alternatives such as GMI via taxation. The main proposals are listed in Table 1.

**3. Mixed financing model based on a pay-as-you-go system**

As pointed out above, the idea of basic aids is not new because there are already minimum aids, minimum income schemes and proposals for general minimum income. However, there is no overall aid system based on a sustainable, standard scheme. In this section, we propose a pay-as-you-go system as a support for basic social aid.

Many national social security systems are based on pay-as-you-go frameworks in which the revenue collected in each financial year is redistributed to cover the spending in that year. Technically, this system is based on financial actuarial equivalence (Kaiser, 1962; Thullen, 1977; Zelenka, 1958):

$$K_n \cdot \int_{t_n}^{t_{n+1}} S(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau = \int_{t_n}^{t_{n+1}} B(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau \tag{1}$$

where

$S(\tau)$ : sum of pensionable earnings of contributing workers for period  $\tau$

$K_n$ : percentage of contribution

$\delta(\tau)$ : strength of interest

$B(\tau)$ : aid spending function at time  $\tau$

$\int_{t_n}^{t_{n+1}} S(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau$ : this indicates the total wages of contributing workers updated to the start of the interval  $[t_n, t_{n+1}]$

$\int_{t_n}^{t_{n+1}} B(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau$ : this indicates the total aid spending updated to the start of the interval  $[t_n, t_{n+1}]$

**Table 1.** Proposals for financing guaranteed minimum income (GMI).

| Measure   | Characteristics   | Researcher  | Year                   | Scope                    |
|---|---|---|------------------------|--------------------------|
| Inheritance tax                                       | 100% levy on inheritances   | Paine (1796), Van Parijs (1992), Steiner (1996), White (2003) | 1796, 1992, 1996, 2003 | Nationwide               |
| New tax   | Tax on energy   | Genet & Van Parijs (1992)                                     | 1992                   | Europe                   |
| New tax   | Environmental taxes + taxation of non-basic income  | Kooistra (1994)   | 1994                   | Global, funded by the UN |
| Replacement of existing benefits by GMI + IRPF reform | Merging of current monetary benefits into GMI + elimination of any tax exemptions or rebates + application of personal income tax rates to all types of income other than GMI | Raventós (1999)   | 1999                   | Spain, Catalonia         |
| Replacement of existing benefits by GMI + IRPF reform | Elimination of existing monetary benefits + reallocation of funding + tax revenue   | Noguera (2002)  | 2002                   | Spain                    |
| Replacement of existing benefits by GMI + IRPF reform | Tax policy: reallocation of public spending + restructuring of welfare state + new tax resources and other taxes  | Iglesias (2002)   | 2002                   | Spain                    |
| New tax   | Creation of a GMI tax on the revaluation of the economy. A variant of the Tobin tax   | Pinto (2003)  | 2003                   | Spain                    |
| IRPF reform   | IRPF reform: elimination of benefits for joint tax returns + elimination of deductions and discounts  | Mercader (2004)   | 2004                   | Spain                    |
| IRPF reform   | IRPF reform: encouragement of deductions from quota & refundable loans  | Pinilla (2006)  | 2006                   | Spain                    |
| IRPF and VAT reform                                   | IRPF reform: rises in effective average rates of IRPF and indirect taxes, VAT   | Sanzo (2005)  | 2005                   | Spain and Basque Country |
| IRPF reform   | IRPF reform: elimination of reductions and deductions from tax base and quota, application of a single tax rate to each earnings bracket                                      | Arcarons, Raventós, & Torrens (2015)                          | 2015                   | Catalonia and Spain      |

GMI, guaranteed minimum income; IRPF, Spanish personal income tax; VAT, value added tax. There are major differences between the forms of financing based on tax modifications (particularly in personal income tax) (see Table 1), and many of them are not backed up by prior quantitative analyses. Source: own work.

If both sides of the equation in the expression above are considered:

- (i) the initial population to be covered at the start of the period  $l(t_n)$ , breaking down the wage function  $S(\tau)$  into two factors ( $s(\tau)$  or the average wage at time  $\tau$  and the number of people in work  $l^a(t_n)$ ); and
  - (ii) the spending function  $B(\tau)$  is also broken down into two factors ( $PM(\tau)$  or the average aid received at time  $\tau$  and the group of beneficiaries  $l^b(t_n)$ ),
- then the following is obtained:

$$K_n \cdot \int_{t_n}^{t_{n+1}} \underbrace{s(\tau)}_{\text{Productivity}} \cdot \underbrace{\frac{l^a(t_n)}{l(t_n)}}_{\text{Occupation}} \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau$$



$$= \int_{t_n}^{t_{n+1}} \overbrace{\underbrace{PM(\tau)}_{\text{Generosity of the system}} \cdot \underbrace{\frac{l^b(t_n)}{l(t_n)}}_{\text{Coverage of the system}}}_{\text{Institutional Factor}} \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau \tag{2}$$

This contribution-based model takes into account three basic factors that condition its viability (Conde-Ruiz & Alonso, 2006):

- (i) The demographics of the target population.
- (ii) The labour market from which compulsory contributions are to be drawn, including salaries, the productivity factor and the employment level of the labour force of the country.
- (iii) The institutional factor, broken down into two subfactors:
  - (i) the coverage of the system in terms of the number of beneficiaries as a proportion of the total population; and
  - (ii) the generosity of the system in terms of the level of financial benefits provided by the system, measured in line with the purposes of the benefits to be paid.

This system provides horizontal support (transfers from income to expenditure), vertical support (offsetting between different income levels) and cross-sectoral support (from one generation to another) (Cichon et al., 2004). However, the tendency to break down the national welfare provision system into smaller groups that are required to be self-financing inevitably widens the gaps in the coverage levels of benefits (García-Núñez, 2002). In the case of Spain, doubt is currently being cast on the viability of the social security system and in some sectors a trend is observed towards the division of solidarity groups. In this context the extreme case is that of individual accounts. This inevitably creates inequalities and uncertainties in regard to benefits (ILO, 2012).

Furthermore, this model entails financing the BSA not just from contributions but also from the tax revenue currently earmarked for the aids that it is to replace.

$$K_n \cdot \int_{t_n}^{t_{n+1}} \overbrace{\underbrace{s(\tau)}_{\text{Productivity}} \cdot \underbrace{\frac{l^a(t_n)}{l(t_n)}}_{\text{Employment}}}_{\text{Labour market}} \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau + \int_{t_n}^{t_{n+1}} \overbrace{SC(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau}}_{\text{Tax factor}} \cdot d\tau$$

$$= \int_{t_n}^{t_{n+1}} \overbrace{\underbrace{BSA(\tau)}_{\text{Generosity of the system}} \cdot \underbrace{\frac{l^b(t_n)}{l(t_n)}}_{\text{Coverage of the system}}}_{\text{Institutional Factor}} \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau \tag{3}$$

where

$BSA(\tau)$ : sum of social aid benefits in period  $\tau$

$SC(\tau)$ : sum of state contributions for period  $\tau$

One immediate consequence of this proposal is the restructuring of the first level, i.e., the contributory pillar. On becoming aid beneficiaries all citizens would receive the BSA adjusted to their own personal characteristics (place of residence, age, dependents, etc.). If their welfare contributions over their years at work add up to a contribution-based benefit lower than the BSA then they receive the BSA. However, if the sum is higher than the BSA they also receive an additional amount in line with the contributions paid.

Aid beneficiaries continue to receive their pensions normally, but from the viewpoint of financing sources their make-up is different. On the one hand beneficiaries receive the BSA and on the other any additional amounts due to them as a result of their contributions during working lifetimes. In funding the BSA it is therefore necessary to determine what proportion of the financing provided by the state in contribution-based benefits would correspond to the BSA.

Not only the budget allocation for social security defined-contribution benefits but also that for unemployment benefits would be affected. Unemployed persons would receive the BSA and any additional amount due to them in line with their contributions and the time for which they have contributed. The amount to be spent should therefore be the proportion of public spending on unemployment benefits that corresponds to the BSA. This means considering two levels: the first is the BSA itself and the second is the additional amount (if any) resulting from contributions paid in. Contribution-based social security benefits would thus have to be divided into two levels, in line with the two levels proposed by the World Bank: one comprising the BSA and the other any additional amount resulting from contributions.

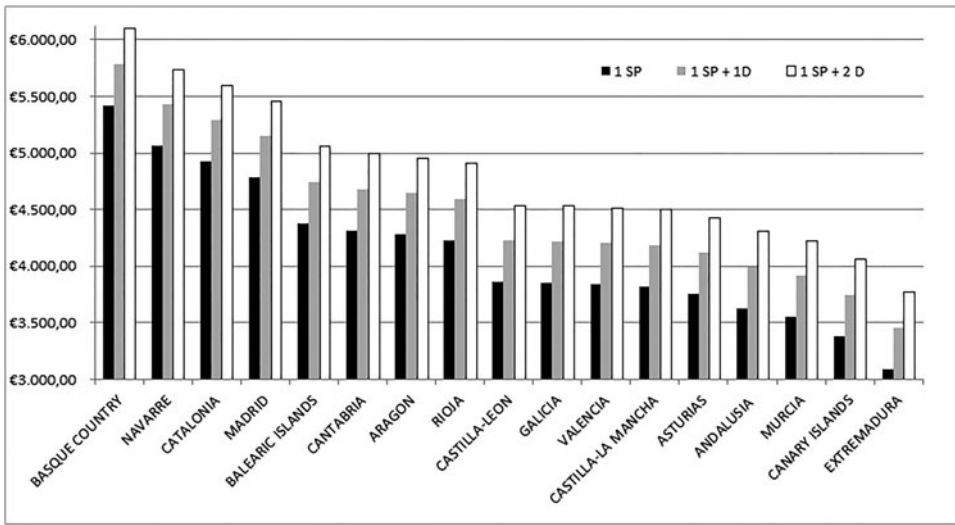
## 4. Application to Spain

In this section the mixed financing model described is applied to Spain. This means that the cost of the BSA for the country as a whole must be estimated.

### 4.1. Cost

Peña-Miguel et al. (2015) detail the regression factors in the sample used in the Spanish EPF 2010 household budget survey, which quantifies the aggregate and individual benefits payable to 22,203 respondents (see [Appendix 2](#)). The raising factor<sup>1</sup> for the INE (Spanish National Statistics Office) sample is then used to extrapolate the results to the full population in 2010 of 45,147,618 (INE, 2010). This gives an average benefit of €3,820.48 per annum for universal coverage. This amount corresponds to a main breadwinner aged 40 who is a wage earner with no dependents in his/her charge and who lives in a municipality with a population of between 10,000 and 50,000 people in the region of Extremadura (a low-income region) ([Figure 1](#)).

If this aid is paid to the whole population (wage earners and non-wage earners alike) the total expenditure  $BSAT_{2010}$  would be as follows:



**Figure 1.** Estimated BSA per household (€ per annum) depending on region and number of dependents.

Note: SP, main breadwinner; 1D, one dependent; 2D, two dependents. Source: own work based on Peña Miguel et al. (2015).

**Table 2.** Cost per group of beneficiaries for financial year 2010.

| BSA            | Average BSA | Cost for 2010 (€ M) | Cost per Group (%) |
|----------------|-------------|---------------------|--------------------|
| The unemployed | 3,176.13    | 10,591.7            | 14,148%            |
| Pensioners     | 4,368.67    | 54,871.9            | 73,297%            |
| Others         | 3,323.02    | 9,399.0             | 12,555%            |
| Total          |             | 74,862.6            | 100,000%           |

Source: own work based on Peña Miguel et al. (2015).

$$BSAT_{2010} \int_{t_n}^{t_{n+1}} B(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau = \text{€}172,485 \text{ million} \tag{4}$$

However, to raise the level of social protection to the point where it covers basic necessities there is a need to increase the non-contributory or social assistance-based level of social security benefits in Spain for those people who have no resources of their own. This means looking at pensioners, unemployed persons and other groups (students, emancipated minors, etc.) who live outside a family unit and lack the income needed to meet those necessities.

The target group is therefore those individuals who do not work and can feasibly receive the aids unified under the scheme proposed. The cost of providing a basic social aid to part of the population (those without wage earnings) –  $BSAP_{2010}$  – is:

$$BSAP_{2010} = \int_{t_n}^{t_{n+1}} B(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau = \text{€}74,862 \text{ million} \tag{5}$$

Table 2 breaks down the cost of each non-wage-earning subgroup, revealing that 73.30% of the total for 2010 would go to beneficiaries. Pension beneficiaries would

**Table 3.** 2010 State contributions that would be replaced by the BSA (millions of Euros).

| Item  | Contribution |
|---|--------------|
| Regional guaranteed minimum income (RMI) schemes (100%)   | 766.73       |
| Non contributory pension schemes, LISMI (social integration and job placement for the disabled), SOVI (statutory old-age and invalidity cover) and other subsidies (100%) | 13,828.12    |
| Contribution-based pensions (35%)   | 37,033.06    |
| Unemployment: contributory level (85%)  | 20,931.25    |
| Non contributory pension quota (100%)   | 142.57       |
| State contributions <sub>2010</sub> -SC-  | 72,701.73    |

Source: own work based on IGAE (State Auditors' Office), Ministry of the Treasury and Public Administration (2010).

also have the highest BSA per main breadwinner with the same characteristics as for the general BSA (40 years old, no dependents, living in a town of between 10,000 and 50,000 people in the region of Extremadura).

#### 4.2. Mixed model

Once the cost is worked out it is then possible to determine the level of contributions needed to fund that cost solely from the labour market (contribution-based model). This initial percentage represents the maximum contribution that would be payable per working individual to fund the zero pillar of social welfare.

The labour market factor for Spain is obtained from the 2010 Wage Structure Survey (EES, 2010). This survey gives the gross wage earnings of the Spanish population in that year broken down by age groups. The amount obtained from the sample population surveyed is then extrapolated to the full working population in 2010 (18,408,100 individuals according to the Labour Force Survey for 2010 (EPA, 2010)). This gives the following:

$$S_{2010} = \int_{t_n}^{t_{n+1}} S(\tau) \cdot e^{-\int_{t_n}^{t_{n+1}} \delta(\tau) \cdot d\tau} \cdot d\tau = \text{€}517,909 \text{ million} \quad (6)$$

The tax factor is obtained from the budget allocations of the various public administrations in Spain earmarked for funding minimum benefits, 'guaranteed minimum income for integration (RMI)' and similar schemes. When the BSA is considered as part of the basic level of social welfare provision all these allocations can be simplified. In 2010 a total of €766.7 million was allocated to RMI, and in 2013 the figure was €1.04 billion (Ministry of Health, Social Services and Equality, 2014). Apart from these aids the public-sector social security system also provides supplements to bring payments up to minimum aid level and non-contributory benefits for beneficiaries with low incomes. In 2010 these supplements amounted to €8.903 billion, out of total subsidy payments of €13.828 billion (Table 3).

Apart from the budget items shown in Table 3, 35% of the public-sector budget endowment for contributory benefits would be transferred to the funding of the BSA (this being the proportion of the average contributory benefit amount for 2010 (€779.89 per month) accounted for by the average coverage of the BSA (€272.89 per month). The same would go for the budget allocations for the contributory unemployment payments for funding the basic level: the BSA for the unemployed

**Table 4.** BSA as a proportion of the total wage bill.

| Rate per group                                      | Contribution (%) |
|---|------------------|
| $K_n^{Unemployed}$                                  | 2.05             |
| $K_n^{Pensioners}$                                  | 10.59            |
| $K_n^{Others}$                                      | 1.81             |
| $K_n^{Zero\ pillar\ in\ contribution-based\ model}$ | 14.45            |
| $K_n^{Zero\ pillar\ in\ mixed\ model}$              | 0.44             |

Source: own work.

would account for an average of 85% (€615.66 per month) of the average unemployment benefit in 2010 (€842.40 per month).

This funding and all the other funds provided by the various public administrations to cover basic welfare provision amounted in 2010 to €72,701.73 million (Table 3). Current funding for regional guaranteed minimum income schemes would be switched in full to funding the BSA, which would in all cases be higher than the regional schemes and would serve the same purpose.

Finally, the item ‘non-contributory pension quota’ represents the amount prepaid by the regional communities of Navarre and the Basque Country (under their respective schemes for the regional collection of taxes which are then paid on to the central government) to cover the payment of aids in their regions which are actually payable by the state. Given that all the non-contributory pensions paid under this quota system are lower than the BSA they would be subsumed into it, so the full amount currently allocated to funding them would be switched to the funding of the BSA.

By applying the above factors, the proportion of the total wage bill accounted for by this benefit in Spain in 2010 can be obtained for each group covered. The resulting figures (see Table 4) are the maximum percentages of wage earnings of workers that would have to be redistributed to fund the BSA for the year in question. In the case of 2010 the BSA would account for 7.16% of GDP with the contribution-based model. The group of beneficiaries to which the highest proportion needs to be devoted is that of pensioners, with 10.59% of the total wage bill. However, under a mixed financing model only 0.44% of the total wage bill is needed.

### 4.3. A proposal with a 12-year time frame

Changes in the population, the economy and the labour market in a country have a direct effect on the financing of its social security system (Cichon et al., 1999). This is factored into the model set out above, so to examine the changes over time in the cost of basic social aids over the coming 12 years we now put forward three potential scenarios in line with the recommendations of the Ageing Report (European Commission, 2012).

The demographic, economic and labour-related circumstances expected in each scenario are set out. Given that the base year for this study is 2010 and there are already confirmed data available for part of the time frame, the data are adjusted accordingly prior to the setting out of the three potential scenarios.

There are five variables in each scenario:

**Table 5.** Technical basis for the three scenarios.

|                               | Pessimistic Scenario 1 | Neutral Scenario 2 | Optimistic Scenario 3 |
|-------------------------------|------------------------|--------------------|-----------------------|
| <b>Demographic Trend</b>      |                        |                    |                       |
| Fertility rate                | 90.00%                 | 100.00%            | 110.00%               |
| Immigration rate              | 90.00%                 | 100.00%            | 110.00%               |
| Emigration rate               | 110.00%                | 100.00%            | 90.00%                |
| Mortality rate                | PE 2000 NP             | PE 2000 NP         | PE 2000 NP            |
| <b>Economic Trend</b>         |                        |                    |                       |
| Variation in GDP              | 0.00%                  | 1.00%              | 2.00%                 |
| Variation in updating rate    | 1.50%                  | 2.00%              | 3.00%                 |
| CPI variation in BSA products | 3.00%                  | 2.00%              | 1.50%                 |
| <b>Labour Market</b>          |                        |                    |                       |
| Trend in wages                | 0.00%                  | 1.00%              | 2.00%                 |
| Trend in unemployment         | 3.00%                  | 0.00%              | -3.00%                |

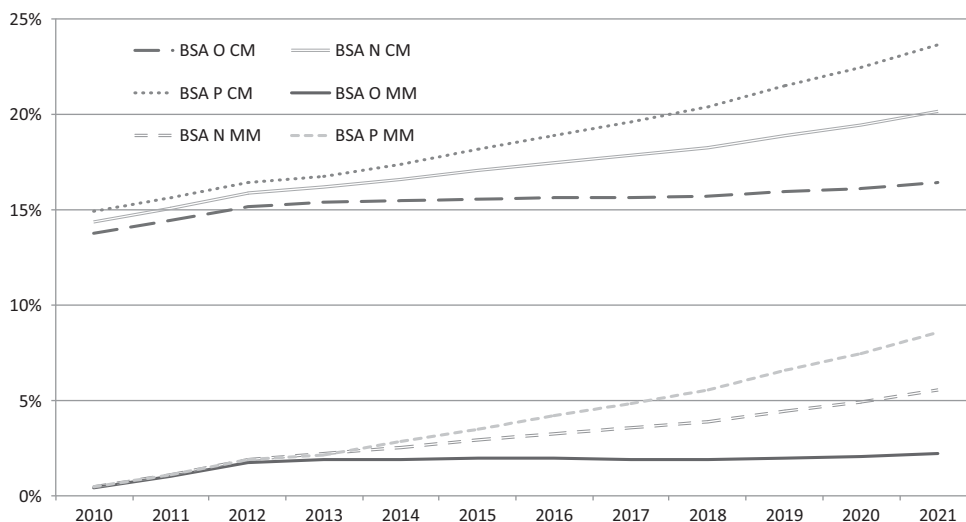
Source: own work.

1. Demographics: the population structure by age groups serves to estimate the potential number of contributors and the number of beneficiaries expected in the coming years. The general population data required are the following (Plamondon et al., 2000):
  - population broken down by age groups and sex (INE, 2010),
  - fertility rates and percentage breakdown by gender of children born (INE, 2010),
  - mortality rates (PE 2000 NP survey of the general population in Spain),
  - immigration and emigration rates and their variation (INE, 2010).
2. The economy: the main variables that serve to forecast the state and development of the economy are the following.
  - (i) GDP: the percentage of GDP allocated to the BSA serves to measure the level of spending that an efficient, foresighted public administration can afford without getting into difficulties in circumstances of all types, including the most adverse.
  - (ii) Consumer price index (CPI) variations in the products to be covered by the BSA.
  - (iii) The benefit updating rate. The 12-year time frame used here envisages a risk-free interest rate for investment in updating the relevant values.
3. Labour market: the trend in wages and the variation in the number of people who transition from one employment status to another<sup>2</sup> (EPA, 2010) (Table 5).

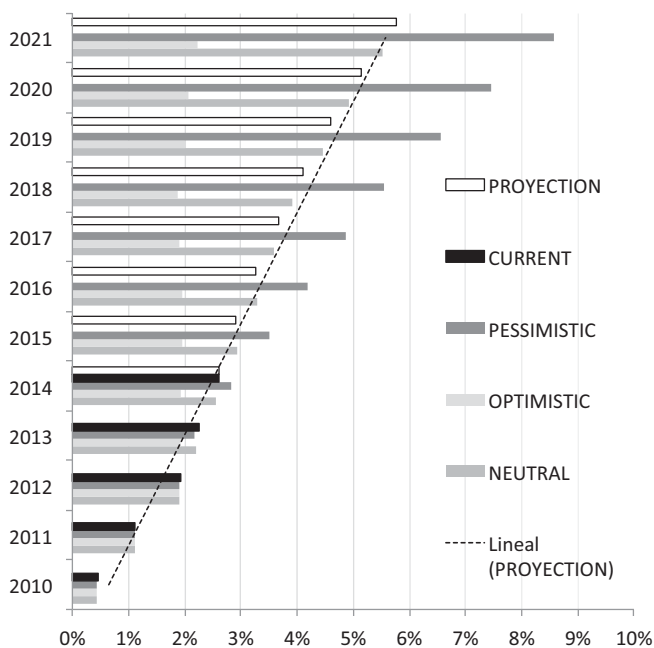
#### 4.3.1. Scenarios

The pessimistic scenario is characterised by negative trends in all variables. In other words, the demographic trend shows moderate decreases in immigration and moderate increases in emigration resulting in a negative net balance, i.e., a fall in population. The economic trend is negative, with GDP stagnating, positive (but low) benefit updating rates and a CPI that increases by a far higher rate than wages, thus substantially decreasing purchasing power.

Under the neutral or baseline scenario all variables are assumed to follow a constant trend with no significant variations. This means a demographic trend in which



**Figure 2.** Comparison of forecast BSAs: contribution-based model (CM) and mixed model (MM). Source: own work.



**Figure 3.** Forecast for BSA: mixed model. Source: own work.

there are only non-significant variations in immigration and emigration rates, an economic trend in which GDP hardly grows at all, a positive but moderate updating rate and increases in the CPI slightly greater than those in wages.

The optimistic scenario is characterised by a positive trend in all variables: the demographic trend shows a moderate increase in immigration and a moderate decrease in emigration, resulting in a positive net balance (increase in population).

The economic trend is positive thanks to a moderate increase in GDP, a positive benefit updating rate and increases in CPI which are lower than the increases in wages, so that purchasing power increases.

Finally, the demographic trend expected for the coming 12 years (European Commission, 2012) is one of slight growth, with the population increasing from 46 million in 2010 to 48.1 million by 2020.

#### 4.3.2. Outcomes

Depending on the variable selected for comparison and on the basis of the trends hypothesised the intervals in which the BSA system can be found and its trends for the next three legislatures (12 years) can be seen.

Figures 2 and 3 show the percentages of the contributions paid on the total wage bill of individuals in work required to fund the BSA under the contribution-based and mixed models. In all cases an upward trend is observed, due mainly to increases in aid amounts and in the number of beneficiaries in the cycle, resulting in parallel movements in the two models.

In 2010 state contributions accounted for 5.93% of the year's GDP and the cost of a hypothetical BSA would be 16.5% of GDP, so the remaining 10.57% would have to be funded by wage-based contributions.

However, under the mixed model the contributions required are not so high (Figure 2), because funding from taxation is incorporated (state contributions) ranging from 0.4384% in 2010 to 2.23%, 5.52% and 8.57% for the three scenarios in 2021.

Funding the basic aid would entail maintenance costs ranging from 7% of GDP under the contributory model (1.23% for the mixed model) in 2010 to 13.6% of GDP in the pessimistic scenario in 2021 (5.22% for the mixed model). Under the neutral scenario the figure would be 9.21% of GDP (3.28% for the mixed model), and the lowest figure is that of the optimistic scenario, at 7.86% of GDP (2.08% for the mixed model). See Appendix 2.

It can be seen in Figure 2 (taking into account the latest data on 2014) that the current situation is very close to a neutral scenario. Therefore, the cost and the financial resources which are needed to support a basic social aid are well calculated and the amount calculated is close to the real cost for the non-working populations. The reasons are as follows.

*Demographic trends:* fertility rates have fallen steadily compared to 2013 and the variation in mortality rates has fallen steadily by 0.02%. The migration rate, in terms of net flow, has decreased because immigration has only grown by 2.00% and emigration has fallen by 21% (INE, 2014). Therefore, in terms of demographic trends the situation is between a neutral and a highly pessimistic scenario, but nearer to a neutral scenario because these demographic variables have undergone only slight fluctuations.

In terms of economic trends, the percentage of GDP has risen by 1.4%, which brings it into neutral scenario territory. Meanwhile, the variation in the benefit updating rate, which in the 12-year time frame envisages an interest rate for updating the relevant amounts free from investment risks, was 2% in 2014, which is what really happens in a neutral scenario. On the other hand, the CPI fell dramatically by 3.5%



due to the ongoing financial and economic crisis. Although this could be catalogued as an optimistic scenario, the risk of continuous deflation, its consequences in our economy and its negative influences on employment, consumption, investment and business activity must be taken into account.

Finally, in terms of the job market, there is only a very slight improvement in the trend in wages and unemployment, so the job market can currently be considered to be in a neutral scenario.

## 5. Conclusions and implications

Calculations have determined that the cost of implementing and financing a BSA would be so great that it would be necessary to transform the whole socioeconomic system. Even if the current level of state contributions is maintained, and even though those contributions would cover practically all costs involving the unemployed and the group of 'other' beneficiaries, a substantial proportion of the total wage bill would need to be earmarked for funding the BSA to cover benefits for workers and pensioners.

In no case would state contributions cover more than half the cost of implementing these benefits, so additional financing would be needed to cover the rest. This supports the validity of the mixed financing model. Other researchers have suggested alternative means of securing the additional financing required (see [Section 2](#)), or resorting to the creation of new taxes, e.g., a tax on tourism or other goods and services. However, paying the BSA would still necessitate the payment of high costs on the part of society.

This means that contribution-based social security benefits would need to be divided into two levels as proposed by the World Bank. The first level would comprise the BSA and the second would be the additional amount arising from contributions paid in.

Providing a minimum aid in Spain included in the social assistance level and based on pensions that cater for the basic necessities of households would entail a far-reaching revision of the first pillar of social provision. Recall that the current system is split between contributory and non-contributory benefits, while the inclusion of the BSA would mean that all beneficiaries would receive a guaranteed minimum aid calculated to meet their basic necessities plus an additional amount in line with their contributions. Logically, pensioners whose pension rights work out to less than the minimum required to meet basic necessities would receive the guaranteed minimum, as they do now. Those who are entitled to higher benefits would receive their full amounts and therefore would not be affected by the split. The changes made would be in how the minimum for meeting basic necessities is defined, in the factors considered in setting it and in the inclusion of a three-way funding system for all aids in which the state acts as the guarantor of the basic social aid for those without income and employers and workers fund the difference in line with the amount of the contributions made to the system and how long they have been paid.

These findings make a relevant contribution and offer an affordable system never before presented. However, this study is not without limitations that will be need to

be overcome in future research. The first is that our data are not updated, mainly because we sought to analyse the years when the social and economic crisis started to increase in Spain. It would be interesting to undertake further research with a current database and compare the evolution of social benefit aid. It would also be very interesting to extend the study to other countries, such as France, Italy or Germany.

## Notes

1. This is equivalent to the number of individuals represented by the respondent and the sum of all the raising factors is equal to the total Spanish population in 2010.
2. For example from working to unemployed, from working to retired, from unemployed to retired and individuals who join the workforce for the first time.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Funding

This study was supported by UFI 11/51 (Business Management & Territorial/Social Governance) at the UPV/EHU, Polibienestar Research Institute and Consolidated Research Group EJ/GV: IT 897-16.

## ORCID

J. Iñaki De La Peña Esteban  <http://orcid.org/0000-0002-7478-5571>

Noemí Peña-Miguel  <http://orcid.org/0000-0003-3259-7289>

## References

- Adema, W. (2006). *Social assistance policy development and the provision of a decent level of incomes in selected OECD countries*. OECD social employment and migration working papers (vol. 38). Paris: OECD.
- Arcarons, J., Raventós, D., & Torrens, L. (2015). Feasibility of financing a basic income. *Basic Income Studies*, 9(1–2), 79–94.
- APFC (2009, January). *An Alaskan's guide to the permanent fund*. Retrieved from <http://www.apfc.org/home/Media/publications/2009AlaskansGuide.pdf>.
- Beramendi, P. (2012). *The political geography of inequality. Regions and redistribution*. Cambridge: Cambridge University Press.
- Clark, D. (2005). Sen's capability approach and the many spaces of human well-being. *The Journal of Development Studies*, 41(8), 1139–1368.
- Cichon, M., Scholz, W., Van der Meerendonk, A., Hagemerjer, K., Bertranou, F. & Plamondon, P. (1999). *Financing social protection*. Geneva: ILO.
- Cichon, M. & Hagemerjer, K. (2007). Changing the development policy paradigm: Investing in social security floor for all. *International Social Security Review*, 60(2–3), 189–219.
- Cichon, M., Scholz, W., van de Meerendonk, A., Hagemerjer, K., Bertranou, F., Plamondon, P. (2004). *Financing social protection*. Geneva: International Labour Office/International Social Security Association.

- Clegg, D. (2013, January). *Dynamics and varieties of active inclusion: A five-country comparison, deliverable D5.6, FP7 project combating poverty in Europe: Re-organising Active Inclusion through Participatory and Integrated Modes of Multilevel Governance*. Retrieved from [http://cope-research.eu/wp-content/uploads/2013/10/D5.6\\_Comparative\\_Report.pdf](http://cope-research.eu/wp-content/uploads/2013/10/D5.6_Comparative_Report.pdf).
- Conde-Ruiz, J. I. & Alonso, J. (2006). *The Pension System in Spain before the challenge of the Aging, Presupuesto y Gasto Público*, 44. Instituto de Estudios Fiscales.
- Coulter, F., Cowell, F., & Jenkins, S. (1992). Differences in needs and assesment of income distributions. *Bulletin of Economic Research*, 44, 77–124.
- EES - *Wage Structure Survey*. (2010). INE - Spanish National Statistics Office.
- EPA - *Labour Force Survey*. (2010). INE - Spanish National Statistics Office.
- European Parliament. (2010). Role of minimum income in combating poverty and promoting an inclusive society in Europe. European Parliament resolution 2010/2039 (INI).
- European Commission. (2012). The 2012 Ageing Report. Economy and budgetary projections for the 27 EU MEMBER States (2010–2060).
- Figari, F., Matsaganis, M., & Sutherland, H. (2013). Are European social safety nets tight enough? Coverage and adequacy of minimum income schemes in 14 EU countries. *International Journal of Social Welfare*, 22, 3–14.
- Frazer, H., & Marlier, E. (2009). *Minimum income schemes across EU member states: Synthesis report. EU network of National Independent Experts on social inclusion*. Brussels: European Commission.
- García-Núñez, F. (2002). The autonomous complements National Health Service or Social Assistance? *Revista Ministerio de Trabajo y Asuntos Sociales*, 34, 129–167.
- Genet, M. & Van Parijs, P.H. (1992). Eurogrant basic income. *Research Group Bulletin*, 15, 4–7.
- Gough, I. (1996). Social assistance in Southern Europe. *South European Society and Politics*, 1(1), 1–23.
- Gough, I., Bradshaw, J., Ditch, J., Eardley, T., & Whiteford, P. (1997). Social assistance in OECD countries. *Journal of European Social Policy*, 7(1), 17–43.
- Guio, A. (2005). *Material deprivation in the EU. En EUROSTAT Statistics in Focus*. Luxembourg: Office of Official Publications of the European Communities.
- Holzmann, R., & Hinz, R. (2005). Old-Age Income Support in the 21st Century. An International Perspective on Pension Systems and Reform. World Bank.
- International Labour Office –ILO-. (2012). *Social protection floors for social justice and a fair globalization*. International Labour Conference, 101st Session.
- Immervoll, H. (2012). Minimum-income benefits in OECD countries: Policy design, effectiveness and challenges. In D. J. Besharov y & K. Couch (Eds.), *Counting the poor: New thinking about European poverty measures and lessons for the Unites States* (pp. 171–210). New York, NY: Oxford University Press.
- IGAE -Government Administration's General intervention body-. Ministerio de Hacienda y Administraciones Públicas, 2010
- Iglesias, J. (2002). Basic Income: Perfecting the process of implantation. *Revista internacional de filosofía política*, 19, 71–88.
- ILO, (2002). Social Security: A new consensus. Geneva International Labour Office.
- INE – Spanish National Statistics Office. (2014, January). *Spanish immigration and emigration rates*. Retrieved from [http://www.ine.es/inebmenu/mnu\\_migrac.htm](http://www.ine.es/inebmenu/mnu_migrac.htm).
- INE – Spanish National Statistics Office. (2010, January). *Spanish population*. Retrived from <http://www.ine.es>.
- Kaiser, E. (1962). Functional equations for the Social Mathematics. A.I.S.S. III. International Congress. Madrid.
- Kazepov, Y. (2011). *The economic and social policy*. In U. Ascoli (Ed.) *Il Welfare in Italia*. Bologna: Il Mulino.
- Kooistra, P. (1994). *Het ideale eigenbelang, Een UNO–Marshallplan voor alle mensen* (pp. 201). Kampen: Kok Agore.

- Kulke, U. (2007). The present and future role of ILO standards in realizing the right to social security. *International Social Security Review*, 60(2–3), 133–158.
- Lalioti, V. (2016). The curious case of the guaranteed minimum income (GMI): Highlighting Greek ‘exceptionalism’ in a Southern European context. *Journal of European Social Policy*, 26(1), 80–93. doi:10.1177/0958928715608795
- Laparra, M. (2011). The hollows of the social protection in Spain. In Laparra, M., & Pérez Eransus, B. (Eds.). *El primer impacto de la crisis en la cohesión social en España*. Madrid: Fundación FOESSA.
- Martínez, M. (2010). Regional minimum income schedules. A comparative approach. *Cuadernos de Relaciones Laborales*, 23(2), 151–189.
- Matsaganis, M. (2013). *The Guaranteed Minimum Income and its Role in Dealing with the New Social Issue*, in *National Institute of Labour and Human Resources (ed.) Guaranteed Minimum Income: Approaches and Proposals in View of the Pilot Implementation of the Scheme*. Study no. 8/2013. Athens: National Institute of Labour and Human Resources.
- Mercader, M. (2004, January). *The arithmetic of a Basic Partial Income for Spain: an evaluation with EspaSim*, in XI. Encuentro de Economía Pública, Barcelona. Retrieved from [www.nodo50.org/redrentabasica/descargas/mercader-prats2004.pdf](http://www.nodo50.org/redrentabasica/descargas/mercader-prats2004.pdf).
- Medina, M. (2009, January 28–31). *The perspectives of the basic income in Latin America*, in Conferencia del 8º Foro Social Mundial en Belem do Pará. Brasil.
- MISSOC. (2011). *The EUs mutual information system on social protection*. European Commission.
- Nelson, K. (2010). Social assistance and minimum income benefits in old and new democracies. *International Journal of Social Welfare*, 19(4), 365–378.
- Noguera, J. A. (2002). Basic income or basic job? Some arguments from the social theory. *Sistema: Revista de ciencias sociales*, 166, 61–86.
- Palacios, R., & Knox-Vydmanov, C. (2014). The growing role of social pensions: History, taxonomy and key performance indicators. *Public Administration and Development*, 34. doi:10.1002/pad.1682.
- Paine, T. (1796). Agrarian justice (pp. 605–623). In P. F. Foner (ed.). *The Life and Major Writings of Thomas Paine*. Secaucus, NJ: Cita del Press.
- Peña-Miguel, N., De La Peña, J. I. & Fernández-Sainz, A. (2015). Main factors for a proposal for a social protection floor. *Social Indicators Research*, 123(1), 59–76.
- Pinilla, R. (2004). *The Basic income of citizenship. A key offer for the renovation of the welfare state*. Barcelona: Icaria Ed.
- Pinilla, R. (2006). *Beyond the well-being. The basic income of the citizenship like social innovation based on the evidence*. Barcelona: Icaria Ed.
- Pinto, R. (2003). *The foundations of the basic income and the perestroika of the capitalism*. Barcelona: Cyan.
- Plamondon, P., Drouin, A., Binet, G., Cichon, M, McGillivray, W. R., Begard, M., & Pérez-Montas, H. (2000). *Actuarial practice in social security*. Gêneva: ILO/ISSA.
- Raventós, D. (1999). *The right to the existence. The offer of the Universal Guaranteed Aid*. Barcelona: Ariel.
- Regidor, E., Calle, M. E & Navarro P. (2003). Trends in the association between average income, poverty and income inequality and life expectancy in Spain. *Social Science & Medicine*, 56(5), 961–971.
- Rhodes, M. (1996). Southern european welfare states: Identity, problems and prospects for reform. *South European Society and Politics*, 1(3), 1–22.
- Roemer, J.E. (1998). *Equality of opportunity*. Cambridge, MA: Harvard University.
- Roemer, J. E., Aaberge, U., Colombio, J., Fritzell, S., Jenkins, A., Lefranc, I., Marx, M., Page, M., Pommer, E., Ruiz-Castillo, J., San Segundo, M. J., Tranaes, T., Wagner, G. G., & Zubiri, I. (2003) To what extent do fiscal regimes equalize opportunities for income acquisition among citizens? *Journal of Public Economics*, 87, 539–65.
- Sanzo, L. (2005). The introduction of the basic income in Spain. *Cuadernos de Relaciones Laborales*, 2, 123–149.

- Sanzo, L. (2011). Basic income and social protection in Spain. In Casassas (Ed). *La Renta Básica en la era de las grandes desigualdades*. Barcelona: Ed. Montesinos.
- Service Canada (2012, January). *Guaranteed income supplement*. Retrived from <http://www.servicecanada.gc.ca/eng/services/pensions/oas/gis/>.
- Steiner, H. (1996). Three just taxes. In P. Van Parijs (Ed). *Arguing for basic income*. London: Verso.
- Storms, B. & Van Den Bosch, K. (2009). What Income Do Families Need For Social Participation At The Minimum? A Budget Standard For Flanders? UA/Berichten, Antwerp, Herman Deleeck Centre for Social Policy.
- Thullen, P. (1977). *Mathematische methoden der sozialen sicherheit: Systeme der invaliden alters-und*. Buch. Karlsruhe Werl. Versicherungswirtschaft.
- Van Mechelen, N., Marchal, S., Goedeme, T., Marx, I. y. & Cantillon, B. (2011). *The CSB-minimum income protection indicators dataset (CSB-MIPI)*. CSB Working paper 11/05. Antwerp: University of Antwerp.
- Van Parijs, P. (1992). *Competing justifications of basic income*. London: Verso.
- White, S.L. (2003). *The civic minimum*. Oxford: Oxford Universtity Press.
- World Bank. (1994). *Averting the old-age crisis: Policies to protect the old and promote growth*. New York, NY: Oxford University Press.
- Zelenka, A. (1958). *Quelques remarques sur le régime financier in ISSA: Actuarial and statistical problems of social security*, Vol. III (Geneva and Rome).

## Appendices

### Appendix 1

**Table A1.** Spending on BSA as a proportion of GDP in Spain over the next 12 years in each scenario.

| Year | BSAP/GDP    |         |            | (BSAP-SC)/GDP |         |            |
|------|-------------|---------|------------|---------------|---------|------------|
|      | Pessimistic | Neutral | Optimistic | Pessimistic   | Neutral | Optimistic |
| 2010 | 7.16%       | 7.16%   | 7.16%      | 1.23%         | 1.23%   | 1.23%      |
| 2011 | 7.49%       | 7.49%   | 7.49%      | 1.56%         | 1.56%   | 1.56%      |
| 2012 | 7.86%       | 7.85%   | 7.84%      | 1.93%         | 1.92%   | 1.91%      |
| 2013 | 8.18%       | 7.99%   | 7.85%      | 2.25%         | 2.06%   | 1.98%      |
| 2014 | 8.49%       | 8.13%   | 7.85%      | 2.56%         | 2.19%   | 1.98%      |
| 2015 | 8.83%       | 8.27%   | 7.87%      | 2.90%         | 2.34%   | 1.99%      |
| 2016 | 9.15%       | 8.39%   | 7.85%      | 3.22%         | 2.46%   | 1.98%      |
| 2017 | 9.46%       | 8.50%   | 7.83%      | 3.53%         | 2.57%   | 1.95%      |
| 2018 | 9.78%       | 8.61%   | 7.80%      | 3.85%         | 2.68%   | 1.93%      |
| 2019 | 10.24%      | 8.82%   | 7.87%      | 4.31%         | 2.89%   | 2.00%      |
| 2020 | 10.66%      | 8.99%   | 7.89%      | 4.72%         | 3.06%   | 2.01%      |
| 2021 | 11.15%      | 9.21%   | 7.96%      | 5.22%         | 3.28%   | 2.08%      |

Source: own work.

## Appendix 2

**Table A2.** Quantile and OLS regressions by category.

|                        | Quantile Regression |                   |                   | OLS                |
|------------------------|---------------------|-------------------|-------------------|--------------------|
|                        | 25%                 | 50%               | 75%               |                    |
| Age                    | 49.71* (128.078)    | 50.53* (5.28)     | 51.8305* (4.49)   | 63.85* (5.81)      |
| Age squared            | -0.27* (-72.2)      | -0.24* (-2.47)    | -0.21** (1.97)    | -0.28** (-2.7)     |
| Number of descendants  | -648.87* (-681.21)  | -891.53* (37.99)  | -1276.62* (45.12) | -1141.48* (-42.38) |
| Town (10,000; 50,000)  | 508.35* (256.7)     | 538.74* (11.04)   | 454.47* (7.27)    | 567.89* (10.14)    |
| More than 50,000       | 214.60* (96.58)     | 199.36* (3.64)    | 13.96 (0.21)      | 96.03 (1.52)       |
| Head of household (HH) | -273.09* (-89.94)   | -162.59** (-2.17) | -9.08 (-0.1)      | -180.79** (-2.1)   |
| Unemployed             |                     |                   |                   |                    |
| Retired                | 216.11* (73.17)     | 472.01* (6.49)    | 692.13* (7.88)    | 429.90* (5.14)     |
| Other                  | 86.37* (21.71)      | 555.33* (5.66)    | 744.56* (6.31)    | 464.59* (4.13)     |
| Constant               | 1107.64* (105.36)   | 1370.20* (5.29)   | 1786.33* (5.72)   | 996.38* (3.35)     |
| Income                 | 0.12* (2662.4)      | 0.16* (141.707)   | 0.21* (154.89)    | 0.17* (129.09)     |
| Gender                 | 459.26* (248.29)    | 685.95* (15.05)   | 1001.55* (18.23)  | 845.74* (16.17)    |

\*\*, \*significance at the 5 and 1% levels, respectively. *t*-statistics are in parentheses. Regional dummies are also included in all the regressions.

Source: Peña Miguel et al. (2015).