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# A Dynamic Analysis of the Effect of Social Security Reform on Spanish Widow Pensioners

**Summary:** This paper shows the dynamic effects of the reform of the Spanish social security pension system on the pensions received by one of the most vulnerable groups of the population, namely, widows. We undertake a duration analysis to account for the effects of reform over time. We study the effects on the widows' overall financial welfare in terms of the evolution of their risk of poverty. We show that the combined effects of the measures to be implemented will have a positive impact; that is to say, the risk of poverty diminishes with respect to the current financial situation of the widows. However, the risk of poverty increases as the pensioners get older.

**Key words:** Dynamic welfare, Widow, Pension, Social security, Policy reforms.

**JEL:** H55, I38, J14.

The reform of the pension systems in the European Union, provoked by the estimated effects of the ageing population on the financial imbalances of the systems has again become a priority on the political agendas of the various countries. These reforms will have positive effects on future fiscal imbalances because the implemented measures are intended to constrain the rate of growth of pension expenditure, but they will have also have an effect on the overall financial welfare of the retired population.

The effects that these reforms may have on the welfare of future generations of pensioners have not yet been widely studied (Barbara A. Butrica, Smith E. Karen, and Eugene C. Steuerle 2006; Holly Sutherland et al. 2006; Marie-Eve Lachance 2008; Frédéric Gonand and Florence Legros 2009; Patricia Peinado and Felipe Serrano 2012). These studies demonstrate that the implemented or planned reforms in the various European countries and in the USA could have different effects on the welfare system, depending on which various combinations of the parameters are chosen (eligibility conditions, retirement age and indexation of the pension benefit).

The scope of the present paper is to test the effects of the recent Spanish welfare reform on one of the most vulnerable groups in the population: the recipients of widow pensions. In order to do so, the parametric reforms recently passed by the Spanish Parliament are taken as a case study.

The features of the widow pensions are very similar to those of the vast majority of developed countries (Steven H. Sandell and Howard M. Iams 1997; Choi

Jongkyun 2006; Nadia Karamcheva and Alicia Munell 2007)<sup>1</sup>. The two most characteristic features that are highlighted in every study are as follows: the high concentration of women who received this benefit, and the higher probability that these recipients would find themselves in a state of poverty relative to retired men who received a retirement pension in Spain. In Spain, according to the Spanish Continuous Survey of Working Lives (2007), 95.5% of widow pensions paid by the Spanish social security system are received by women (widow pensions). This has to do with the predominant social and family pattern of the past decades, which is characterized by the weak (and irregular) entrance of women into the workforce. In 2009, only 35.6% of retirement pensions were drawn by women, and their average pension was equal to only 59% of men's pensions. Additionally, women's life expectancy is higher than that of men (both before and after the legal retirement age).

With respect to the risk of poverty, the Spanish Survey of Life Conditions (ECV 2007) indicates that risk among Spanish men who receive a pension benefit (widowhood or other pension) is 29% while this rate reaches 33% for women. In the case of widows and widowers who live alone, the risk of falling into poverty is 28.4% for men and 36.2% for women. At almost 8 points higher than the rate for men, this rate represents one of the highest risks of poverty registered in the EU (Ahn Namkee and Florentino Felgueroso 2007). The risk of poverty for men who do not live alone is practically equal for men and women (9.4% and 9.3%, respectively).

The aim of this paper is to evaluate the effects of the reform, which was passed by the Spanish parliament in August 2011, on the future welfare of the people who are owed a widow pension. Welfare is analysed by means of the poverty risk associated with the widow's pension.

As we will note in the following study, poverty rates cannot be related exclusively to the income stemming from pensions. However, in Spain a unique situation makes poverty risk particularly sensitive to the pension benefit, as a household's greatest source of wealth is held in the form of home ownership. After Singapore Spain is the country with the highest rate of home ownership in the world. More than 80 per cent of Spanish households own the house in which they live. Holding investments in this way increase the sensitivity of the effects of the reforms on the welfare of the retired population for two different reasons. On one hand, the ageing process of the population has a negative effect on the value of housing (Elöd Takáts 2010), ending in a loss of accumulated wealth. On the other hand, it is difficult to convert this asset into income, as has been shown by the poor development of financial products designed to achieve this objective (home-equity reversion). As a consequence, the changes in the widow pension may have a deeper impact on the actual poverty risk of the Spanish elderly population than one that might be observed in other European Union countries, in which savings in the form of real and financial assets are distributed differently.

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<sup>1</sup> In the case of Spain, in which widow pensions account for 26.58% of the total number of pensions paid by social security (in absolute terms 2,273,470 pensions in the year 2009), the most detailed analysis of this benefit can be found in Namkee Ahn and Florentino Felgueroso (2007).

This article is organised as follows. In Section 2, we offer some methodological considerations about the indicator that was chosen to measure the financial welfare of widow pensioners. In Section 3, we explain the methodology and data used. Section 4 presents the results, and, finally, we discuss the most relevant conclusions.

## 1. Measuring the Welfare of Widow Pensioners

The income flow of an individual is, on the one hand, the sum of the monetary income stemming from economic activity (in our case the income flow provided by the pension system), and, on the other hand, the income (if it exists) stemming from the decumulation of savings and/or such profitability of savings. A person's risk of entering a situation of *relative poverty* (Herman Deeeck, Karel Van den Bosh, and Lieve De Lathouvewer 1992) depends on two factors. It can depend on the poverty line selected, or it can depend on the total amount of income drawn compared to such a poverty line, that is to say, whether the sum of the total income is higher or lower than the poverty line selected.

To evaluate the effect of the reform of the pension system on the welfare of widow pensioners we will compute the *poverty risk that would result if income from social security were the sole source of income for the pensioners*. That is to say, the poverty risk that stems from the used of income of social security. The variation in the risk of poverty presented here cannot be related to the real risk of poverty given that this paper cannot take into consideration the wealth held by individuals. The wealth variable, which is necessary to compute the poverty rate of individuals, is not included in this analysis because pertinent information is not available. Spain does have information about the wealth of households (Spanish Survey of Household Finance EFF 2005), which includes that of households composed of pensioners. However, this information cannot be matched to our dataset.

Consequently, the poverty rate is only used as an instrument to measure the gains or losses that stem from the reform.

Taking these considerations about the nature of our indicator of poverty risk into account, we use the standard poverty threshold proposed by the European Union, which is 60 per cent of the median equivalised income<sup>2</sup>.

## 2. Spain's Pension System and Reform Proposal

### 2.1 Widow Pension Benefit

Widows in Spain are entitled to a benefit that is related to the pension of their husbands. Precisely for this reason, it is classified within the group of *derived* pension

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<sup>2</sup> Eurostat. 2009. Statistics.

[http://epp.eurostat.ec.europa.eu/portal/page/portal/income\\_social\\_inclusion\\_living\\_conditions/data/database](http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/data/database) (accessed September, 2009).

The poverty threshold is defined as 60 per cent of the Equivalised Median Income for households comprising one single person between 1995 and 2007 (Eurostat 2009). For the period 1986-1994, the poverty line is defined as the 60 per cent of the Equivalised Mean Income estimated by Mercedes Prieto and Carmelo Garcia (2007). Consequently, poverty threshold changes every single year according to income changes.

benefits, which may be drawn only after the husband's death. More concretely, expression (1) describes the pension  $i$  drawn by the widow in year  $t$ . Under the current law, a widow's pension can be calculated by applying a coefficient  $\eta$  equal to 52 per cent of the *regulatory base* of her husband. This result constitutes the Effective Pension of the widow, which forms the basis for the computation of the final benefit to which the widow is entitled.

$$\text{WidowPension}_{it} = \eta \text{RegulatoryBase}_i + \text{Reassessment}_{it} \quad (1)$$

The regulatory base constitutes the basis for the computation of the husband's retirement pension. The husband's contributions to the social security system during his working life are analysed and then used to compute the benefit to which each individual, according to the regulation, is entitled. Let  $TAE_t$  denote the Taxable Average Earnings of the husband in period  $t$ , where each period is measured as a month. Then the regulatory base of the husband is computed as the weighted sum of the last 180 months of Taxable Average Earnings, or, in other words, the Taxable Average Earnings of the last 15 years of contributions. The last 24 months of contributions to the system are weighted as 1, that is, they are computed by their nominal value. The months prior to these last 24 months (months 25 to 180) are weighted according to an index that is intended to take into account the price evolution that has been registered for a given period of time. Concretely, these previous earnings are adjusted by means of the coefficient between the price level in the 25<sup>th</sup> month and the price level in the respective month  $t$ . The price level in the economy is measured according to the Consumer Price Index ( $CPI_t$ ). Finally, the result is divided by 210 in order to obtain the value of the regulatory base to which the pensioner (husband) is entitled. Expression (2) shows the exact formula used to compute the regulatory base ( $RB$ ) of the pension.

$$RB = \frac{\sum_{t=1}^{24} TAE_t + \sum_{t=25}^{180} TAE_t \frac{CPI_{25}}{CPI_t}}{210} \quad (2)$$

The pensioner will then draw his pension, more or less proportionately, as determined by this regulatory base and depending on the years of contribution to the system. After 15 years of contributions, the initial pension is equal to 50 per cent of the regulatory base. Each additional year of contribution increases the percentage of the regulatory base between 2 and 3 per cent. The total amount of the regulatory base is drawn only by those individuals who have contributed for at least 35 years. This percentage, however, is not taken into account for the computed widow benefit. In the case of the widow pension, as mentioned above, the percentage to which the wife is entitled by law is 52 per cent of the regulatory base to which the husband is entitled. This is true even if the husband were entitled to the whole regulatory base because he had contributed for 35 years or even if he were only entitled to 50 per cent of the regulatory base because he had only contributed for 15 years. As a con-

sequence, the effective pension to which the widow is entitled is 52 per cent of the regulatory base of her husband.

Additionally, the widow pension is adjusted according to the Consumer Price Index (*CPI*), also known as the *reassessment* of the pension. In the case of a widow pension, the reassessment may be described as having two different components. First, the effective pension is initially revised through an accounting of the evolution of the consumer price index dating from the year in which the husband started to draw his retirement pension until the year in which he died; consequently, the widow acquires the right to draw the benefit of the widow pension. The sum of the effective pension plus this amount of reassessment constitutes the initial pension to which the widow is entitled. The widow draws this initial pension during the first year of widowhood. In subsequent years, the widow pension benefit is adjusted according to the annual evolution of the Consumer Price Index (*CPI*). Reassessment then increases each year as a result of the indexation of the pension benefit to the Consumer Price Index for that year.

In sum, as shown in expression (1), the widow pension, drawn by widow  $i$  in the year  $t$ , is the result of addition of the amount of *reassessment* $_{it}$  to the effective pension to which the widow is entitled, that is, the result of applying the 52 per cent coefficient to the corresponding regulatory base.

A widow pension, like the rest of pensions within the system, is complemented with other benefits of a means-tested nature (basically the minimum complements), which are not taken into account in this study. These complementary benefits are discretionary. Every year, the government defines the minimum poverty threshold, which takes into account both personal and household characteristics of the pensioner. It is beyond the scope of this paper to determine the effect of these complementary benefits, so they have not been included in the estimates. In any case, the inclusion of these complementary benefits would not alter the estimated results given that the minimum complement remains below the poverty threshold and thus does not eradicate poverty among these pensioners.

## 2.2 Reform Proposal

The reform that the Spanish parliament passed in the summer of 2011 proposes various plans of action. In this paper we will discuss only those strategies that have a direct impact on widow pensions. On one hand, we refer to the new parameters that will be used to compute the regulatory base. Once the reform is fully implemented (which is slated for the middle of the next decade), the number of years to be included in the computation of the regulatory base will increase from the current 15 to 25. This increase implies a reduction in the regulatory base of about 10 per cent; that is to say, 1 percentage point for each year (Rafael Muñoz de Bustillo et al. 2007). The reform also includes a modification of the coefficient applied to the regulatory base. This coefficient will increase from the current 52 per cent to 60 per cent. Additionally, this second measure does not envision a long gestation period before it is put in practise because the law will be applied beginning January 1, 2012. The first of the measures, cited above, will, *ceteris paribus*, reduce the widow pension, but the second measure will have the opposite effect.

Our aim is to quantify the combined effect of these two measures. We sought to answer the following question: is the change in the computational method of the regulatory base compensated for by the increase in the coefficient applied to it when a widow pension benefit is computed? If this question can be affirmed, then the reform would be considered neutral or even positive for the welfare of future recipients of widow pensions. As a consequence, the reform would have no effect on the pensioners; it might even help diminish their risk of future poverty.

### 3. Data and Methodology

#### 3.1 Data Source

The source of data is the Spanish Continuous Survey of Working Lives (MCVL), which conducts an annual survey for the Spanish Ministry of Immigration and Social Security.

These data, which have been collected annually since 2004, provide information about the working lives of 1,170,000 pensioners and employed workers<sup>3</sup>. Our analysis has been carried out using the information of the standard widow pension from the year 2007. The standard holder of a widow pension is defined as the pensioner who draws a single pension and does not draw any other complementary benefit.

The entire path of pension benefits has been reconstructed for each pensioner in the data according to the pension formula<sup>4</sup> used by the Spanish Social Security System up to the year in which the pensioner entered the system. As a consequence, the study has been undertaken with an unbalanced panel dataset, which starts in the year 1986 and concludes in the year 2007. Each widow enters the panel in the year when her corresponding pension is acknowledged and continues until the end of the period, which is the year 2007. After the database was debugged, the total number of individuals included in the study was 28,386.

#### 3.2 Methodology

The employed method is the dynamic duration analysis based on the estimates proposed by Edward Kaplan and Paul Meier (1958). Applying this method, one can follow the evolution of the pensioner's welfare over time from the moment she starts drawing the pension. Dynamic duration analysis is the most appropriate method for studying pensions such as this one in the Spanish system, in which the pension benefit is adjusted according to the evolution of a given price index but not

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<sup>3</sup> The Spanish social security system comprises the General Social Security Scheme, with which salaried workers as a whole are affiliated (71% of the total number of those affiliated), and a Special Self-employed Workers Scheme, with which the self-employed are affiliated (15% of the total number of those affiliated). The rest of the system comprises several minor groups, such as fishermen or mine workers. This study is focused exclusively on pensioners who are part of the General Social Security Scheme.

<sup>4</sup> The reassessment, corresponding to the period of time from when the retiree starts receiving the pension to the moment the widow starts drawing, it has been assumed to be fifty percent of the effective pension, as shown by the estimates used in the data.

of a productivity index. The effect is known in the research literature as the “ageing process of the pension benefit” (Peinado and Serrano 2012).

The cumulative probability of a poor widow pension (cumulative risk of poverty) in period  $t$  is given by one minus the value of the survivor function (Tony Lancaster 1990) in the moment  $t$ , and the survivor function is written as follows in expression 3:

$$\hat{S}(a_m) = \prod_{r=1}^m \left[ \frac{N_r - E_r}{N_r} \right] \quad (3)$$

$$m = 1, \dots, M$$

where  $\hat{S}(a_m)$  is the estimate of the probability not to be poor in the moment  $m$ , where  $N_r$  is the number of individuals who remain in the sample in the moment  $r$  (because they have not been counted or because they have not entered a poverty situation), and where  $E_r$  is the number of people who precisely in the moment  $r$  fall below the poverty line.  $M$  is the maximum number of periods analysed, which is 22 in this study.

The Poverty Effect of the Reform ( $PER_m$ ) is measured as the difference in the cumulative risk of poverty before and after the reform for each period  $m$ . In other words, it is the difference between the cumulative risk of poverty as shown in expression 4 where in each period  $m$  the probability of not being poor before the implementation of the reform is identified by  $(\hat{S}_0(a_m))$  and the probability of not being poor after the reform  $k$  by  $(\hat{S}_k(a_m))$ :

$$PER_m^k = (1 - \hat{S}_k(a_m)) - (1 - \hat{S}_0(a_m)) \quad (4)$$

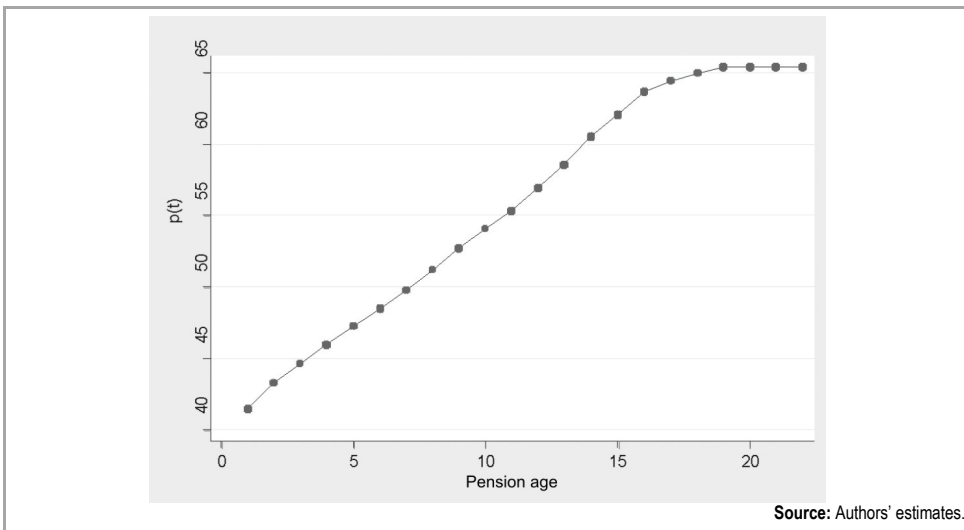
$$m = 1, \dots, M$$

The estimates are presented in four scenarios. The first scenario (Baseline) presents the situation before the implementation of the reform. It shows the cumulative poverty risk faced by widow pensioners before the reform is implemented. The second scenario (10% Regulatory Base) quantifies the effect on the cumulative poverty risk analysed in the previous step of the reform, which consists of an increase of the period used to compute the regulatory base from the last 15 to the last 25 years. The third scenario (60% Coefficient) quantifies the effect of the reform when it consists of an increase in the applied coefficient from the current 52 to 60 per cent. The last scenario (Total Reform) analyses the effect of the reform when both policy measures are implemented at the same time, that is, both an increase in the number of years used to compute the regulatory base from the last 15 to the last 25 and an increase in the coefficient applied to the regulatory base from 52 to 60 per cent.

## 4. Results

### 4.1 The Current Welfare of Spanish Widow Pensioners

Figure 1 shows the estimates of the evolution of the cumulative poverty risk faced by Spanish widow pensioners before the implementation of any of part of the reform; that is to say, it presents the current situation or baseline scenario. As can be observed, in the year in which the pension is first paid out, the poverty risk is about 41.5 per cent. The risk shows an upward trend, that is, it continues to rise over time. As the estimates of the function show, 51.2 per cent of the beneficiaries of a widow pension fall below the poverty line 8 years after they start receiving the pension. In other words, the evolution of the function shows that 51.2 per cent of the women who have just entered the system will stand below the poverty line 8 years after first drawing their pension. For example, a pensioner who becomes a widow in the year 2004 and starts drawing her pension in 2004 is expected to fall below the poverty line before the year 2013 with a probability of 51.2 per cent. This cumulative poverty risk rises to 63.7 per cent for a pensioner of 16 years and to 65.4 per cent for those who have been drawing their pension for 19 or more years. Thus, the overall financial welfare of the widow pensioner decreases over time as a consequence of the ageing process of the pension she draws.

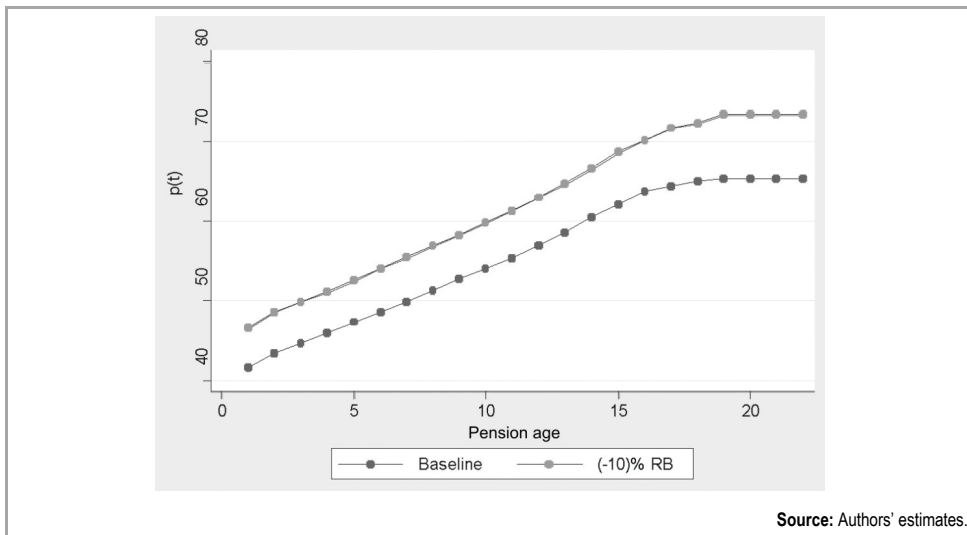


**Figure 1** Baseline: Estimates of the Evolution of the Cumulative Risk of Poverty before the Implementation of any Reform Proposal



## 4.2 The Effect of Changes in the Regulatory Base

Figure 2 shows the effect on widow pensioners of a reform that includes a change in the regulatory base of the individual who implements the pension. Based on Figure 2, several conclusions may be drawn. First, the shape of the function representing the cumulative risk of poverty is similar to the one observed before the implementation of the reform: it increases during the initial periods and then slows down during the last years that the pension is drawn. Second, the reform increases the cumulative risk of poverty for the whole life of the pension. Poverty risk in the initial period increases from 41.5 per cent to 46.6 per cent and from 65.4 per cent to 73.3 per cent in the final period. Third, Figure 2 shows a divergence from the previous trend. The change in the regulatory base causes the cumulative poverty risk to rise from 5.1 percentage points higher than it was for the initial period before the implementation of the reform to 7.9 percentage points higher in the final period. As a consequence, the reverse effects of the reform are shown to be more harmful over time.

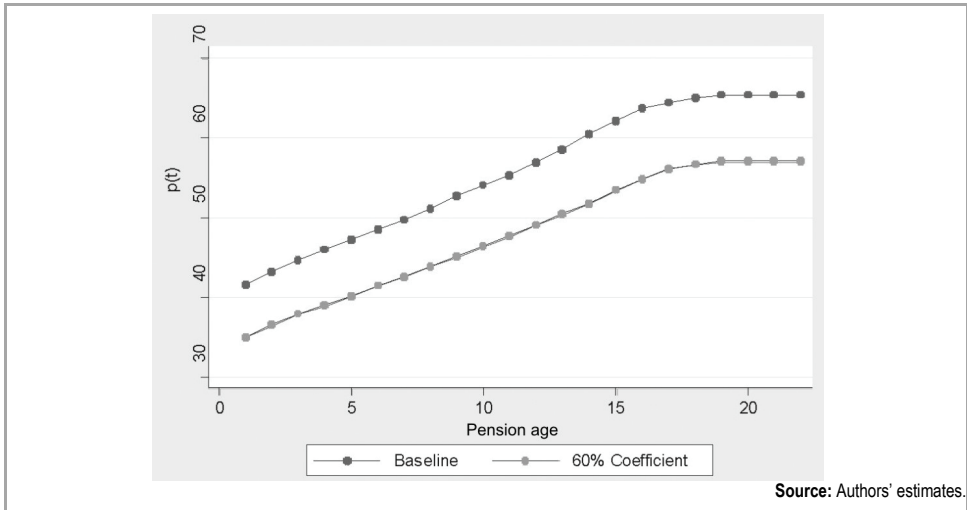


**Figure 2** Effect of a 10 per cent Decrease of the Regulatory Base

## 4.3 The Effect of the Change in Coefficient

A reform that increases the coefficient applied to the regulatory base of the individual who implements the widow pension would, as may be concluded from Figure 3, decrease the cumulative risk of poverty for the whole life of the pensioner in contrast to the risk that was faced when no reform was implemented. This is why the new function (60% Coefficient) is situated below the baseline function. The shape of the graph, as shown in Figure 3, is very similar to that of the baseline, as the increase in the cumulative risk of poverty is greater at the beginning of the period and less at the end. It starts at 35 per cent and ultimately reaches 57 per cent. This evolu-

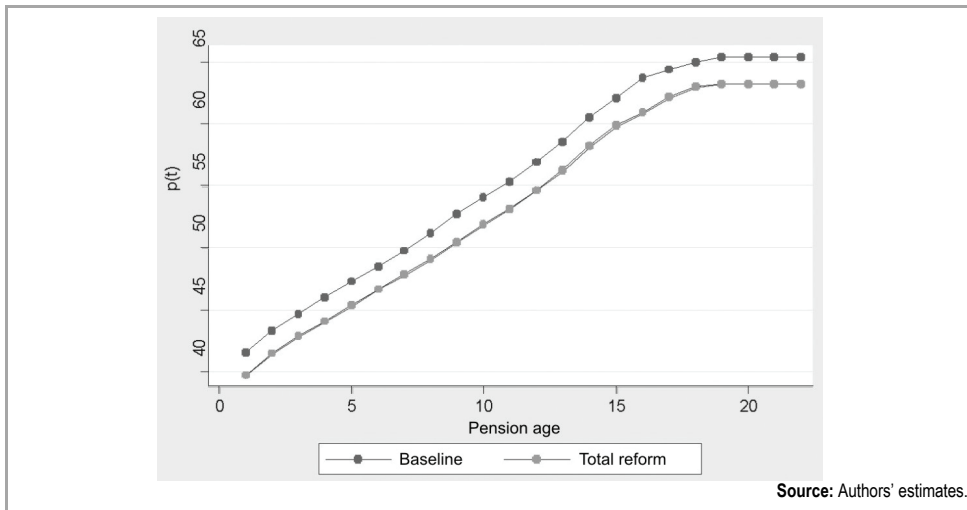
tion implies an initial decrease of the cumulative poverty risk equal to 6.5 per cent, which then increases to 8.3 per cent (Poverty Effect of the Reform). As a consequence, there is a divergence between the cumulative poverty risks faced before (baseline) and after (60% coefficient) the implementation of the reform, although in this scenario the divergence is smaller than the one registered for the previous case, which entailed a diminution of the regulatory base.



**Figure 3** Effect of a Change in the Coefficient Applied to Regulatory Base

#### 4.4 The Final Effect of Total Reform

Figure 4 compares the final effect of the implementation of the total reform (Total Reform) with the initial situation (baseline). When both the regulatory base of the individual who implements the widow pension diminishes by 10 per cent and the applied coefficient to it changes from 52 per cent to 60 per cent, the final cumulative poverty risk of the widow pensioners decreases for the whole life of the widow, as shown in the “Total reform” function, which can be seen below that of the “Baseline”. In this case, where the functions seem to be similar, the divergence between them is even lower over time. The cumulative poverty risk of the Total Reform at the beginning of the period is about 39.7 per cent. This risk increases through the final periods when it reaches 63.2 per cent. Thus, as the Poverty Effect of the Reform demonstrates, the cumulative poverty risk decreases with respect to the baseline by some 1.8 to 2.2 per cent.



**Figure 4** Effect of the Total Reform

## 5. Conclusions

This paper demonstrates the dynamic effect that the reform of the social security pension system has on the overall financial welfare of one of the most vulnerable groups in the population: the recipients of widow pensions. It has been shown that the widow pensioners' level of financial welfare diminishes over time. While a reform that would only entail a longer contribution history to compute the pension benefit would increase the cumulative poverty risk between 5 (initial period) and 8 (final period) per cent, an increase in the coefficient applied to such a regulatory base from 52 per cent to 60 per cent would bring the most positive effects, that is, a decrease in the cumulative poverty risk of between 6.2 (initial period) and 8.3 (final period) per cent compared to the current situation. The combination of the two measures would ultimately have a positive effect on the welfare of the widow pensioners as it would reduce their cumulative risk of poverty by 1.8 (initial period) and 2.2 (final period) per cent. These results make clear the difference between the cumulative poverty risks registered at the beginning and at the end of the period; in other words, the reforms would have a stronger effect on the pensioners as they draw the benefit over a longer period of time.

The results indicate that the intended reform of the social security pension system could prevent one group of pensioners from sinking deeper into poverty. These results, however, should not minimise the fact that the poverty risk of the widow pensioners continues to remain high. In any case, before any new proposals to correct this level of poverty are undertaken, it would be advisable to supplement these results with other studies that would also include an analysis of the wealth variable. This is the only way to ensure that we have a precise idea of the real situation (real poverty risk) in which this group of pensioners might finally find themselves. As has been

frequently noted in this paper, it is not possible at this time to compare the datasets that contain the appropriate wealth information to the dataset here used, which can only provide income information from social security.

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