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Transfers in Spanish State Retirement Pensions

EDUARDO BANDRÉS and ALAIN CUENCA*

Abstract

A central issue in the recent reforms of state pensions in Spain has been to increase the proportionality between contributions and benefits along actuarially fair lines. The aim of this paper is to quantify the transfer component of social security retirement pensions, with transfer being understood as the difference between the pension effectively received and that which would be received under a system of actuarial fairness. The analysis is placed within a life-cycle framework, with particular reference to the distributive effects by income level. The results show that, in the past, there was a marked bias in favour of the objective of intergenerational and intragenerational redistribution, to the detriment of the objective of income insurance. This paper examines the factors that determine the final value of the transfer component within the entire Spanish pensions system.

JEL classification: D31, H55.

I. INTRODUCTION

Social security contributory pensions represent the main spending area within the Spanish public sector. In the 1998 national budget, the provisions for spending under this concept amounted to some 7,476,465 million pesetas and the number of pensions has exceeded 7.5 million. Specifically, it is retirement pensions that absorb the most important part of the budget, accounting for 67.8 per cent of it, followed by widows'/widowers' pensions, with 18.5 per cent, and invalidity pensions, with 12.1 per cent. In other words, more than 12 per cent of

*University of Zaragoza, Spain.

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all disposable family income has its origin in social security contributory pensions.

However, the expected problems with respect to the fiscal sustainability of the pensions system have given rise to a series of reforms in Spain and in other Mediterranean countries. Within these reforms, a key role has been given to the criterion of proportionality between contributions and benefits. In a pay-as-you-go scheme such as that found in Spain, which is somewhat removed from actuarial fairness, the voters tend to consider the system in terms of a tax/transfer model. As a result, the 'generosity' of the social security system is based not on the logic of actuarial fairness, but on the weight that workers assign to old people's welfare in a hypothetical social welfare function. Having said that, the instability caused by demographic transition undermines confidence in public pensions, by reducing the expectations of return and increasing the opportunity cost of the system, both in the present and, above all, in the future, compared with other savings alternatives. The most foreseeable result is an intergenerational conflict that erodes the weight that working generations allocate to retired individuals' welfare in the tax/transfer model, giving rise to lower political support for the public system and a greater propensity towards individual solutions (see Verbon (1987)).

The aim of this paper is to quantify the transfer component of social security contributory retirement pensions, with transfer being understood as the difference between the pension effectively received and that which would be received under a system of actuarial fairness between contributions and benefits. The large amount of the transfer component in Spanish pensions highlights the fact that, in the past, there was a marked bias in favour of the objective of redistribution, to the detriment of the objective of income insurance. However, in the future, the predominance enjoyed by this objective of redistribution could well undermine the political support that is given to the system.

Following the first studies on the life-cycle incidence of pensions, carried out at the beginning of the 1970s, there have been a number of subsequent works, from amongst which mention should particularly be made of Burkhauser and Warlick (1981), Creedy (1982), Hurd and Shoven (1985), Meyer and Wolff (1987), Boskin et al. (1987) and, more recently, Harding (1992), Creedy, Disney and Whitehouse (1993), Falkingham, Hills and Lessof (1993), Wolff (1993) and Nelissen (1994). For the case of Spain, Monasterio and Suárez (1992) and Monasterio, Sánchez and Blanco (1996) have carried out studies into the redistributive component and rate of return of the main social security regimes, presenting results that highlight the importance of the break in the actuarial equilibrium between contributions and pensions, as well as the quite exceptional differences between these regimes. Nevertheless, given the information available, both works are limited to a regime-by-regime comparison, without providing a breakdown of the transfers according to income level and thus making it impossible to calculate the redistributive capacity of the pensions.

Another interesting study of the Spanish case is that of Medel, Molina and Sánchez (1992), which quantifies the distributive effect of pensions and of other social expenditure, albeit on an annual basis and not within the framework of life-cycle incidence. Finally, Durán (1995) and Gil and López-Casasnovas (1997) have employed simulations of the contributory trajectory of different individuals, rather than historical data.

The rest of the paper is organised as follows. In Section II, we present a summary of the Spanish social security system. Section III is given over to an explanation of the methodology employed in the empirical work, with the results being set out in Section IV. Section V closes the paper with a review of the most important conclusions.

II. THE PUBLIC PENSIONS SYSTEM IN SPAIN

In Spain, the public pensions system is made up of two tiers. The first has a contributory nature and operates on a pay-as-you-go basis. The second is non-contributory and is available to those individuals who do not meet the requirements of the first, always provided that their income does not exceed a determined amount. The contributory system is structured as follows: a general regime, which covers workers in the industrial and service sectors; six special regimes, corresponding to the self-employed, farmers, farm workers, coal-miners, seamen and domestic help; and, finally, a special regime covering accidents at work and work-related illnesses. In turn, pensions are divided into the following classes: retirement, permanent invalidity, widows/widowers, orphans and other surviving dependants of deceased workers. Civil servants have a special regime outside social security.

This work is centred on the impact of the life-cycle social security contributory retirement pensions that fall under the general, the self-employed,

TABLE I
Current Retirement Pensions, as at 31 December 1992

<i>Regime</i>	<i>Amount (million pesetas)</i>	<i>Percentage of total</i>
General	111,042	61.29
Self-employed	16,301	9.00
Farm workers	11,307	6.24
Farmers	21,422	11.82
Domestic help	3,935	2.17
Total, five regimes	164,007	90.52
Other regimes	17,175	9.48
Total	181,182	100

Source: Instituto Nacional de la Seguridad Social, *Memoria Estadística Anual 1992*.

the farm workers, the farmers and the domestic help regimes. When taken together, these regimes, as at 31 December 1992, which is the reference point of our research, covered some 86.8 per cent of all contributory retirement pensions and 90.5 per cent of expenditure (see Table 1); thus it can be said that the results obtained are truly representative of the global situation of the system.

In order to have access to a retirement pension, it is necessary, in general, to meet the following requirements: to be registered with social security, to have reached the age of 65 and to have made contributions for a minimum period of 15 years. The most relevant exception concerns the second of these, where workers who were affiliated at 1 January 1967 can retire at 60.

According to the pension rules in force and effect in 1992 — that is to say, applicable to the data being used in this study (these rules, dating from 1985, were modified in July 1997) — the amount of the initial pension is a function of a relevant income measure (the average contribution base of the eight years prior to retirement), the number of years of contribution and the age at retirement. This initial pension, IP , is obtained by applying the legal formula $IP = RB\lambda\theta$. That is to say, the initial pension is the product of the average regulatory base, RB , multiplied by a percentage, λ , which is a function of the number of contributing years, with a minimum of 60 per cent for 15 years (starting from the date when the 1985 reform came into complete force and effect; 50 per cent for 10 years prior to that reform), plus 2 percentage points for each additional year, up to a maximum of 100 per cent for 35 years of contribution. Further, if the retirement age was less than 65, then the above result is reduced in accordance with a correcting coefficient, θ , the value of which moves from 0.92 when retirement takes place at 64, to 0.60 when it takes place at 60, with reductions of 0.08 points per year.

The system also provides for a guaranteed pension for those individuals who, although having completed the required contribution period, nevertheless only have a right to a very low pension by virtue of their meagre contributions, and whose income does not exceed an annual limit. Once the amount of the initial pension has been calculated, it is the subject of periodical revaluation at the beginning of every year according to the anticipated rise in the consumer price index, with a limit on the maximum pension (284,198 pesetas per month in 1997).

Reform in 1997 began the phasing-in of an extension to the period that is taken as the base for the calculation of the regulatory base, RB , from eight to 15 years. The reform also changed the coefficient λ , with the objective of bringing pensions more into line with contributions. The political parties have stated in their programmes that their objective is to continue this line in order to guarantee the future of the pensions system. Having said that, a number of significant reforms have yet to be implemented. Nor is it foreseen that the different regimes

will be merged. We can only say that, since the end of the 1970s, many of the special regimes have gradually disappeared and that one can only assume that this tendency will continue in the future, although there is currently no specific project along these lines.

III. METHODOLOGY

The fundamental objective of this work is to quantify the transfer component that exists in the pensions effectively received by those individuals who are currently retired, to which end we have followed the model proposed by Burkhauser and Warlick (1981), further developed by Meyer and Wolff (1987). The said component is measured by the difference between the real pension and that which would correspond to a system that respects the actuarial equilibrium between the capitalised total of the contributions and the discounted and expected value of the pensions.

Valuing both income streams in the year in which retirement takes place, R (equal to the number of years of contribution), the total contributions of one individual would be the cumulated sum of contributions revalued at some implicit interest rate. Denote this C_R . In turn, the discounted value of the pensions received by current retirement pensioners between the moment of retirement, R , and their death, and valued in R , is derived from the pension level each year times the probability of surviving to that year. Denote this H_R .

Let P_j be the value of the pension derived from applying the calculation and uprating rules of the system that is in force in year j , which will normally differ from the actuarial value that would correspond to it according to the equality $H_R = C_R$. If we call this latter P_A , we can compare the pension actually received in year j (P_j) with that which would correspond to it according to the actuarial fairness between contributions and benefits (P_A). The difference $P_j - P_A$ has to be interpreted, therefore, as the transfer component of the pensions programme in year j :

$$T = P_j - P_A.$$

The basic information needed for the required calculations has been supplied directly by the Directorate General for Economic Planning at the Department of Social Security. For each regime, we have a matrix made up of three variables: the age of retirement (before or after the age of 65), the banded number of years of contribution (in six intervals), and whether or not a minimum pension is received. Thus we initially have 24 cells in each regime matrix, where each cell provides the number of pensions and the average contribution base. This is the best information upon which we can count, because it has not been possible to

gain access to the micro-data representative of a sample of pensioners, including a complete history of their contribution record and pensions received to date.

However, the sizes of the considered cells are very different. As a consequence, and as a general rule, we have proceeded to divide the cells that, under each regime, exceed 10 per cent of total pensions. We have done this in order to rely on more precise information concerning the regulatory bases of the subgroups that, although having similar characteristics with respect to the length of their contribution record, the age of retirement and whether or not a minimum pension is received, nevertheless have very different contribution bases. The contribution bases vary because, in each cell, we have individuals who retired in different years and who have different contribution bases within each year. The methods are described in more detail in the Appendix.

IV. RESULTS

A review of the results obtained for each regime studied shows, first, the high transfer component that, as a general rule, has been enjoyed by all social security retirement pensioners and which, at December 1992, represented some 49.4 per cent of the total amount of the average retirement pension (Table 2). This amount corresponds, therefore, to an intergenerational transfer from employed workers to current pensioners, and its most immediate explanation lies in the maturing process of the system itself. The limited length of the contribution periods and the reduced quantity of the bases, which would have given rise to very low pensions under actuarial equilibrium, have been compensated for by the system through revaluations and through additions to bring pensions up to the minimum pension level, with the financing of these being made possible thanks to the high rates of growth enjoyed by the overall productivity of the economy and to a demographic pyramid which has allowed a high degree of generosity to be shown to pensioners. Our analysis has referred to all retirement pensions that existed in Spain as at 31 December 1992, without the data allowing us to determine the population cohorts to which the pensioners belonged. In any event, it should be noted that, with the passage of time, the conditions for access to the initial pension have been made more stringent, whilst the revaluations have been lower. The overall effect of these changes has been to favour those pensioners who joined the system at an earlier date. By contrast, the maturing of the system has reduced the transfer percentages for newer pensioners.

Second, there is a marked disproportion in the transfer components received under the different regimes. Whilst in the general regime the transfer component is calculated to be 37.1 per cent, in the domestic help regime it reaches some 89.0 per cent, with high figures also being found in the farm workers, the farmers and the self-employed regimes. The breakdown of the transfer component also shows that the differences between the regimes are easy to detect in the initial pension itself and in the additions for minimum pensions. Note that in the

TABLE 2
Transfer Component, by Regime

<i>Regime</i>	<i>Initial neutral pension</i>	<i>Transfer component in initial pension</i>	<i>Revaluations</i>	<i>Addition for minimum pension</i>	<i>Per cent Total transfer component</i>
General	62.90	4.24	28.68	4.18	37.10
Self-employed	41.05	6.64	29.25	23.06	58.95
Farm workers	20.30	27.48	39.66	12.55	79.70
Farmers	16.90	27.10	35.20	20.80	83.10
Domestic help	11.05	21.75	22.23	44.97	88.95
Total	50.62	9.45	30.17	9.76	49.38

farmers, the farm workers and the domestic help regimes, the transfer in initial pensions lies between 21 and 28 per cent, and that the domestic help regime has an addition for minimum pension of close to 45 per cent.

Third, the transfer component has been calculated from an individual perspective, ignoring the possibility that current pensioners could generate survivors' pensions (mostly widows'/widowers' pensions). The available information does not allow a distinction to be drawn between single individuals and couples, but it can be confirmed that the inclusion of survivors' pensions will increase the transfer percentage by an amount equivalent to the discounted value of all survivors' pensions.

Grouping all the regimes together and presenting the results by contribution decile offers more information on the distribution of the transfer component. Again, we take as a reference the capitalised value of the contributions, calculated as the discounted amount of the initial neutral pension.

The distributive pattern of the transfer component across contribution deciles is clearly progressive, as can easily be seen from Table 3. In summary, the pensions system pays relatively more to those who have contributed less, completely breaking the principle of proportionality between contributions and benefits which inspires it.

It would appear at first sight that the objectives of income redistribution might explain this result, as evidenced by the lower revaluation bands for higher deciles and the additions for minimum pensions that were proposed. If contributions had always been the same proportion of the corresponding income levels, then this would indeed have been the case. However, the contribution bases have not been a good indicator of real incomes, and nor have the contribution rates been uniform for equal bases. In the self-employed regime, the contribution bases have been a pale reflection of incomes, especially when the

TABLE 3
Transfer Component, by Contribution Decile^a

<i>Decile</i>	<i>Initial neutral pension</i>	<i>Transfer component in initial pension</i>	<i>Revaluations</i>	<i>Addition for minimum pension</i>	<i>Per cent Total transfer component</i>
1	4.07	7.07	44.91	43.96	95.93
2	12.00	16.63	40.33	31.04	88.00
3	26.13	22.19	31.76	19.92	73.87
4	32.33	18.33	26.02	23.32	67.67
5	47.58	22.35	25.87	4.19	52.42
6	48.63	7.58	31.25	12.53	51.37
7	58.38	-0.29	38.32	3.59	41.62
8	56.20	3.13	40.28	0.40	43.80
9	59.01	5.48	35.51	0.00	40.99
10	80.29	7.90	11.81	0.00	19.71
Total	50.61	9.46	30.17	9.76	49.39

^aThe ranking is carried out in accordance with the amount of the contribution.

aspect of choice and manipulation of the bases has facilitated, until quite recently, the phenomenon known as the 'purchase of pensions'.¹ Additionally, the contribution rates have been systematically lower under the special regimes — as can be confirmed by the average values given in Table 2 — and in certain categories of employment. In the light of this, the true progressivity of the transfer component of pensions is not well illustrated by comparing it with accumulated contributions. By contrast, it can be said that the rates of return achieved in relation to the contributed amounts, and the possibilities for exercising discretion in the choice of bases, have converted the social security self-employed regime into an alternative investment that is without rival.

The results obtained so far have been based on a nominal discount rate of 6.5 per cent, equivalent to a real interest rate of 3 per cent and an expected inflation rate of 3.4 per cent per year. A change in the discount rate will affect the transfer component of pensions and have a small effect on the progressive nature of the system.

On the one hand, an increase (decrease) in the discount rate applied will reduce (increase) the uprated value of future pensions, in such a way that the

¹This phenomenon occurred in the self-employed, farmers and domestic help regimes and consisted of individuals either beginning to contribute or raising their contributions during the last years of their working lives, in order to obtain greater eventual benefits. The introduction of non-contributory pensions as from 1991 and a greater rigour in the application of administrative controls have reduced the profitability of this practice.

transfer component falls (increases) in all the regimes and in all the contribution deciles. With a discount rate of 6.5 per cent, the total transfer component for the whole system is 49.4 per cent of the pension received, whilst with a discount rate of 5 per cent, this component increases to 54.7 per cent, and with a rate of 7.5 per cent, it falls to 45.8 per cent. On the other hand, the effect of a change in the discount rate is not equal in all regimes or in all contribution deciles. Although in all cases the uprated value of future pensions changes by the same proportion, the introduction of different assumptions over the discount rate causes a slight change to the progressive nature of the system, making it more progressive the higher is the discount rate applied.

V. CONCLUSIONS

The objective of this paper has been to calculate the redistributive effect of social security retirement pensions in Spain, by comparing the monthly amount of pension effectively received and the amount that would correspond to an actuarial equilibrium between contributions and benefits. The results obtained allow us to draw the following conclusions.

First, the Spanish social security system is paying out pensions that significantly exceed the amount that is actuarially fair. In total, some 49.4 per cent of expenditure on retirement pensions could be interpreted as an intergenerational transfer from the currently employed to current pensioners.

Second, the combination of different calculation rules for the initial pension, for revaluation procedures and for additions for minimum pensions implies a different redistributive effect in each pension regime. The most favoured regimes are those covering domestic help, farmers and farm workers, with transfer percentages of between 80 and 90 per cent of the value of the pension received. By contrast, under the general regime, which corresponds to employees in the industrial and service sectors, the transfer percentage is 37 per cent, explained in great part by the revaluations accumulated in the past.

Third, the results must be interpreted as the minimum value of the transfer component. We say this for two reasons: first, because we have assumed complete transfer to the employees of the employers' contributions, so that all contributions are assigned to the financing of pensions, without taking into account other benefits, such as sickness or maternity benefits; and, second, because we have not included in our analysis possible survivors' pensions, which would also increase the transfer percentage.

The final conclusion is that the pensions system in Spain has operated more as a mechanism for the redistribution of income than as income insurance for old age. The maturing of the system itself, together with the reforms introduced in 1997, is altering the proportion of the actuarial and redistributive elements of the system, increasing the former and reducing the latter. However, it should be noted that the effects of the reforms will be moderate, given that they only affect

new pensioners who, in 1997, represented some 6.6 per cent of the total. Furthermore, these reforms are being introduced in a phased process and will only be fully in effect after 2002. For these reasons, the 1997 law will not be sufficient and the political agenda contains a number of proposals that will probably give more weight to income insurance.

In summary, the break with proportionality that can be detected in the social security pensions system in Spain has arisen, as a general rule, in response to initially redistributive patterns — namely, the progressive revaluation of pensions and the additions for pensions that do not reach minimum values. Having said that, the imperfections that are abundant within the system have distanced it from this general rule, and it is difficult to justify certain types of transfer that favour those pensioners who are situated in high income strata. Any proposed reform to the pensions system must therefore take into account the redistributive elements of both the current system and its alternatives.

In terms of the reforms that must be undertaken in order to respond to the phenomenon of an ageing population, and given that the main reason for foreseeing a reduction in the political support given to the public system is that it is viewed as a tax/transfer mechanism, any correcting measures must be directed towards the actuarial mechanisms of the system, increasing the proportionality between contributions and benefits and reducing the transfer component. It is our belief that greater proportionality will result in higher political support from the workers, reducing the risk of a migration from collective towards individual solutions and restoring part of the confidence that was lost during the demographic transition.

APPENDIX. CALCULATING THE TRANSFER COMPONENT OF THE SPANISH PENSION PROGRAMME: DETAILED METHODOLOGY

The basic information needed for the required calculations has been supplied directly by the Directorate General for Economic Planning at the Department of Social Security, as described in Section III. In order to subdivide each of the large cells, as described also in Section III, we have assumed that the individual contribution bases follow a log-normal distribution, which is most generally employed in similar studies and which adapts best to the Spanish situation (Jiménez et al., 1994). The total dispersion within those cells has two components, one arising from dispersion across pensioners within years and one arising from dispersion across years. The information employed to estimate these variances is provided by the data in Jiménez et al. (1994) on the distribution of the total amount of retirement pensions by pension decile in each social security regime, and by the Annual Statistical Report of the National Social Security Institute for 1992 with reference to the distribution by monetary bands of the number of pensions in force and effect. From the first of these sources, we have obtained the average amount of the total pension for each pension decile for all

TABLE A.1
Average Monthly Pension, by Pension Decile and Regime, as at 31 December 1992

Decile	<i>Pesetas</i>				
	<i>General regime</i>	<i>Self-employed</i>	<i>Farm workers</i>	<i>Farmers</i>	<i>Domestic help</i>
1	31,347	23,946	31,543	26,766	16,826
2	45,109	33,155	43,014	38,562	32,011
3	47,403	44,668	44,925	44,913	44,733
4	53,520	45,128	44,925	44,913	45,144
5	58,872	45,128	45,881	44,913	45,144
6	71,105	45,128	51,138	45,367	45,144
7	83,338	46,049	53,050	48,542	45,144
8	102,452	52,956	53,050	52,172	45,144
9	120,037	52,956	53,050	53,079	45,144
10	151,384	71,376	57,351	54,440	45,965

the regimes (see Table A.1) and, by matching these with the data from the second source, we have obtained the location of those pensions that receive additions, by way of a simple comparison between the legally established minimum pension and the pension bands included in each decile.

In order to calculate the transfer components, T , we need to be able to calculate the total contributions of any one individual, C_R , and the discounted value of pensions received, H_R . The relevant formulas are as follows. First,

$$(1) \quad C_R = \sum_{j=1}^R B_j t_j \prod_{i=j}^R (1 + r_i)$$

where B_j is the contribution base in year j , t_j is the sum of the contribution rates charged to the employer and the worker, and r_i is the rate of return applied each year to the contributions in accordance with a specific selected interest rate. We include the contribution paid by the employer because we assume the complete transfer to the employee of the employer's contribution, so that all contributions are assigned to the financing of pensions — a hypothesis that is quite common in the literature and which is not rejected by the Spanish case, as has been demonstrated by Argimón and González-Páramo (1987). It is important to note that equation (1) corresponds to a purely hypothetical concept (Wolff, 1993), given that the social security pensions system is constructed on a 'pay-as-you-go' basis, so that contributions do not give rise to the formation of reserves.

Second,

$$(2) \quad H_R = \frac{\sum_{j=R}^{\infty} q_j P_j}{(1+r)^{j-R}}$$

where q_j is the survival probability in year j , P_j is the amount of the pension corresponding to year j , and r is the rate of discount applied to future benefits.

To calculate the capitalised value of the contributions, we have used the average rate of cumulative annual growth of the average contribution bases for general contingencies, $\delta\omega$, for each one of the regimes studied, taking the years between 1967 and 1992 as the reference time period. As a result, the contribution base of one specific year can be linked with the base of the first year of contribution, B_1 : $B_j = B_1(1 + \delta\omega)^{j-1}$. The contribution rate is also calculated taking the average value, \bar{t} , for each regime in the identical period.

Furthermore, the interest rate employed in order to capitalise the social contributions has been the internal return of private bonds for ordinary investors, as a proxy for the return that the contributors would have obtained from a long-term, non-risk-bearing asset. Although long-term public debt would be better than private bonds, the non-existence of a sufficiently long series has prevented us from adopting this as a reference for the rate of interest. We have calculated an average rate for the period 1967–92, obtaining a value of 13.3 per cent.

In summary, the contribution rate, t_j , and the interest rate, r_j , in expression (1) can also be substituted by their average values, \bar{t} and \bar{r} , respectively. As a consequence, expression (1) becomes

$$(3) \quad C_R = B_1 \bar{t} \sum_{j=1}^R (1 + \delta\omega)^{j-1} (1 + \bar{r})^{R-j} .$$

The discounted value of the benefits, which is reflected in expression (2), can be broken down into three concepts which make up the total amount of a pension — that is to say, the initial pension (IP), accumulated revaluations from the moment of retirement up to year j (Z_k), and the addition for minimum pension in year j (M_j). Thus we obtain

$$(4) \quad H_R = \frac{\sum_{j=R}^{\infty} q_j \left[IP + \sum_{k=R}^j Z_k + M_j \right]}{(1+r)^{j-R}} .$$

As an initial supposition, we assume that both the accumulated revaluations and the additions for minimum pensions are an integral part of the transfer component, because in no case will they form part of a funded pensions system. As a consequence, for the moment, we will disregard Z_k and M_j in expression (4), in order to limit ourselves to the discounted value of a constant pension equal to the initial pension. This initial pension is obtained by applying the legal formula $IP = RB\lambda\theta$ described in Section II.

Therefore the discounted value of a constant pension equal to the initial pension is

$$(5) \quad H_R^{IP} = \frac{\sum_{j=R}^{\infty} q_j IP}{(1+r)^{j-R}} = \frac{\sum_{j=R}^{\infty} q_j RB\lambda\theta}{(1+r)^{j-R}}.$$

The average retirement age of those under 65 has been calculated in each one of the regimes on the basis of data from the Ministry of Work and Social Security (Ministerio de Trabajo y Seguridad Social, 1993). The interest rate to be applied in order to discount the pensions is a fixed nominal rate of 6.5 per cent, which can be considered as equivalent to an interest rate of 3 per cent in real terms with an expected average annual rate of inflation of 3.4 per cent. Finally, the survival probabilities are taken from the Mortality Tables of the Spanish National Institute of Statistics (INE). These rates have been corrected for the socio-economic differences in mortality estimated by Regidor et al. (1994 and 1996) for individuals aged between 60 and 64 belonging to three socio-economic groups: manual workers, farmers, and management and professional.

Given that our first objective is to determine the transfer component of the initial pension, TC^{IP} , we compare the capitalised value of the contributions made (C_R) and the discounted value of a pension that is constant and equal to the initial one up to the death of its title holder, H_R^{IP} . This is the same as comparing expressions (3) and (5).

We have then assigned to each pension decile — for which we know the amounts of the initial and total pensions — the amounts that correspond to them for accumulated revaluations and for additions for minimum pensions. Given that, within each decile, we know which pensions equal the minimum and which do not, the allocation of the expenditure on revaluations is immediate for those pensions without additions — that is to say, as the simple difference between the total and the initial pension. In the case of those pensions that do receive additions, the procedure is more complicated and has taken into account the revaluations policy applied to each regime during the last few years — policies that have generally been very progressive.

Finally, having determined the amounts of the initial pensions and of the accumulated revaluations, the value of the additions for minimum pensions is obtained simply as the difference between the sum of these amounts and the average amount of the total pension. The result of all the above is that the total pensions of the regimes studied can be broken down into four parts — namely, the initial neutral pension, the transfer component in the initial pension, the accumulated revaluations and the additions for minimum pensions, where the total of the last three is the value of the transfer component of the pension effectively received.

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