ESTIMATION OF THE IMPACT OF CHANGES IN THE PERIOD USED TO CALCULATE THE REGULATORY BASE ON NEW RETIREMENT PENSION AMOUNTS

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Abstract

Based on a sample of new retirees in 2019, this article estimates the effect which the period considered in calculating the regulatory base has on the initial pension amount. In the analysis the initial pension amount for periods ranging between 15 and 35 years and the result of shortening that period to the most favourable contribution years are calculated. The results show that, within the range indicated, the average initial pension is a monotonically decreasing function of the number of years considered in calculating the regulatory base. Specifically, extending the calculation period from 15 to 25 years would be associated with a fall in the average initial pension of 5.0%, while extending it from 25 to 35 years would entail an additional reduction of 8.2%. Also, simultaneously extending the calculation period to 35 years and discarding the most unfavourable years to determine the regulatory base would help smooth the fall in the average initial pension. At the same time, this would reduce the heterogeneity of pensions among individuals (although the inequality would decline less than if the calculation period were limited to the 35 years preceding retirement). For instance, taking into consideration the 29 most favourable years within the 35 years before retirement would give an average pension similar to that resulting from considering the 25 years preceding retirement. Also, determining the regulatory base in this way would, on average, give rise to an increase in the initial pension benefit amounts of pensions below the median (in comparison with a scenario in which the regulatory base is calculated on the basis of the 25 years preceding retirement) and a fall in the initial benefit amounts of pensions in the fourth quartile of the distribution.

Keywords: initial pension, regulatory base calculation period.

JEL classification: H55, E62.

Resumen

En este documento se estima, a partir de una muestra de altas de jubilación de 2019, el efecto que el período considerado para el cálculo de la base reguladora ejerce sobre la cuantía de la pensión inicial. En particular, en el análisis se calcula la cuantía inicial de las pensiones para períodos de cálculo que varían entre 15 y 35 años, así como el resultado de restringir dicho período a los años más favorables de cotización. Los resultados muestran que, en el rango señalado, la pensión inicial media es una función monótonamente decreciente del número de años considerados para el cálculo de la base reguladora. En particular, la extensión del período de cálculo desde 15 hasta 25 años estaría asociada con una caída de la pensión inicial media del 5 %, mientras que una ampliación desde 25 hasta 35 años produciría una reducción adicional del 8,2 %. Por otro lado, simultanear la ampliación del período de cálculo a 35 años con el descarte de los años más desfavorables para determinar la base reguladora permitiría suavizar la caída de la pensión inicial media, al tiempo que reduciría la heterogeneidad de las pensiones entre individuos (si bien la desigualdad caería en menor medida que si se restringiera el período de cálculo a los 35 anteriores a la pensión). Por ejemplo, tomar en consideración los 29 años más favorables dentro de los 35 años previos a la jubilación arrojaría una pensión media similar a la resultante de tomar en cuenta los 25 años anteriores a la jubilación. Además, esta forma de determinar la base reguladora produciría, en promedio, un incremento de la prestación inicial de las pensiones que se sitúan por debajo de la mediana (con respecto de un escenario en el que la base reguladora se calcula a partir de los 25 años anteriores a la jubilación) y una caída de la prestación inicial para las pensiones en el cuarto cuartil de la distribución.

Palabras clave: pensión inicial, período de cálculo de la base reguladora.

Códigos JEL: H55, E62.

Contents

1 Introduction

In October 2020, the Committee for the Monitoring and Assessment of the Toledo Pact Agreements approved the "Report on the assessment and reform of the Toledo Pact", which included 21 recommendations to serve as guidance for the pension reform (see Comisión de Seguimiento y Evaluación de los Acuerdos del Pacto de Toledo (2020)).

According to the Committee, any pension reforms must respect two of the model's underlying principles: the contributory principle (understood as a balanced relationship between the pensions entitlement and the contributions made over the course of an individual's working life) and the solidarity principle (which modulates the foregoing principle insofar as it allows the lowest pensions to be improved, addresses the gender gap in pensions and ensures their sufficiency).

To reinforce the contributory principle, the 2011 pension system reform lengthened the regulatory base calculation period (the number of years taken into account to average the contribution bases) from 15 to 25 years, and established its gradual implementation between 2013 and 2022. The Toledo Pact report of October advocated analysing the impact of that extension, paying special attention to the possible mixed effects that may arise as a result of the uneven incidence of periods of precarious employment or unemployment during the working life, and to the consequences for the gender gap in pensions. It also addressed other measures, such as the possibility of disregarding the worst years when determining the regulatory base (see recommendation 5 of the report). The Operational Arrangements of the Recovery Plan, approved in November 2021 by the Spanish Government and the European Commission in the context of the development of the Recovery, Transformation and Resilience Plan, include the measure of adjusting and extending the period for calculating retirement pensions.[1]

This paper aims to offer an estimation of the effect that the number of years considered in calculating the regulatory base has on the initial pension amount. To this end, a sample of new retirees in 2019 is used, drawn from the Social Security administrative labour records (MCVL, by its Spanish abbreviation). The quantitative exercise consists, first, of replicating the pension amounts of new retirees observed in the MCVL based on their contribution records and retirement characteristics (age, type of pension, etc.). Different counterfactual (hypothetical) pensions are then calculated based on different mechanisms in terms of the years taken into account to calculate the regulatory base. The calculations are applied to a sample of new retirees subject to the 2011 reform, thus excluding retirements under the previous legislation. In 2019, slightly more than 75% of new retirements were taken under the law approved in 2011.[2]

1 See target 408 of Annex I to the Operational Arrangements, available at: https://www.lamoncloa.gob.es/serviciosdeprensa/notasprensa/hacienda/Documents/2021/101121-CountersignedESFirstCopy.pdf.

2 In addition, the pension entitlements that had been deregistered when the data were extracted from the MCVL are excluded from the sample. General Social Security Regime pension entitlements are maintained if they are accompanied by another retirement taken in 2019.

The empirical exercise shows that, within the 15 to 35-year range, the average initial pension is a monotonically decreasing function of the number of years considered in calculating the regulatory base. Specifically, extending the calculation period from 15 to 25 years would be associated with a fall in the average initial pension of 5%, while extending it from 25 to 35 years would reduce it by a further 8.2%. However, these aggregate effects – which correspond to the average individual changes weighted by the initial pension amount before the extension of the calculation period – appear to conceal considerable heterogeneity across pensioner groups. Specifically, the average decrease in pension benefits would be lower for pensioners with more than one year of contribution gaps or unemployment episodes (in the 15 or 25 years prior to retirement), and for pension benefits below the median. Consequently, initial pension inequality, measured by the P90/P10 ratio of the distribution, would be lower under a 35-year calculation period than under a 25-year one.

Simultaneously extending the calculation period and disregarding the worst years to determine the regulatory base would also smooth the aforementioned fall in the average initial pension. For instance, the average pension calculated taking the 29 best years of the 35 years before retirement would be approximately equal to that calculated based on the 25 years preceding retirement. Furthermore, under this approach pension benefit heterogeneity across pensioner groups would be slightly lower than in the case of the regulatory base calculated using the 25 years preceding retirement. In general, mechanisms restricting the calculation to the best years would have a more positive average effect on those workers affected by contribution gaps or unemployment episodes and on pension benefits below the median.

Three considerations advise caution when interpreting the results of the exercise. First, the analysis ignores that the changes in the regulatory base calculation formula, which impact the pension amount, could influence the decision about when to retire. Second, the effects calculated are restricted to new retirements in 2019. Consequently, the results cannot be directly extrapolated to the future, since the wage and labour characteristics of new pensioners change over time. This aspect may be particularly relevant when analysing the estimated effects on women, since their labour market participation has changed significantly in recent decades. In addition, the pandemic may also have generated other structural changes in the labour market. Third, a very wide range of factors are included in pension calculations, such that the initial pension estimated on the basis of the contribution episodes included in the MCVL has a margin of error with respect to the actual pension amount. The methodological annex included at the end of this paper presents the practical details of the quantitative exercise and analyses in greater depth the third consideration mentioned above.

This is not the first paper to analyse the effects of changing the regulatory base calculation period. Specifically, Devesa et al. (2021a, 2021b and 2022) address, using the 2019 MCVL, the implications for the regulatory base of increasing such period from 25 to 35 years, in addition to the possibility of restricting the calculation to the best 25 years of the last 35. These papers also analyse the heterogeneous effects of these approaches on

the basis of workers' observable characteristics, in addition to their implications for pension expenditure. Although the analysis in this occasional paper has much in common with the above-mentioned papers, there are some key differences. First, this paper focuses on how changes in the calculation period affect the initial pension, rather than the regulatory base. It therefore complements the findings in those papers. Second, this paper analyses the effect of discrete (year-by-year) changes in the calculation period and in the number of best years to calculate the regulatory base. Third, the samples used for the calculations differ.[3] Lastly, the analyses in Devesa et al. investigate the effect of different configurations of the regulatory base calculation period on different standard individuals and on pension expenditure. These matters are not addressed in this paper.

The rest of the paper is structured as follows. Section 2 analyses the impact on the initial pension of different regulatory base calculation periods ranging from 15 to 35 years. Section 3 studies the effects of restricting the calculation period to the best years. Lastly, Section 4 contains the main findings of the exercise.

3 There are 6,143 observations in Devesa et al. (2021a and 2021b), compared with 8,009 in this occasional paper. This difference could mainly owe to the inclusion in this paper of new retirees who have another concurrent pension benefit and of partial retirements.

2 The effect of extending the regulatory base calculation period on the initial pension

Calculating the initial pension consists of applying a percentage to the regulatory base, mainly on the basis of contributory years and retirement age, and of adjusting the result according to a series of factors, such as maximum pension, receipt of the pension benefit while continuing to be employed and the maternity supplement.[4] Broadly speaking, the regulatory base is calculated as the average of the inflation-adjusted contribution bases corresponding to a specific number of years immediately prior to entering retirement (i.e. the "regulatory base calculation period").[5]

The effect of extending the regulatory base calculation period on the initial pension amount is therefore determined by the (adjusted) level of the contribution bases that were previously not included in the calculation of the average. In this regard, since workers' wages tend to increase over time, extending the calculation period tends to lower their average contribution bases because the lowest bases are concentrated in the months farthest away from retirement.

The effect of an extension to the calculation period also depends on the factors applied to the product of the regulatory base and the relevant percentage that determine the initial pension. For example, if a worker is capped by the maximum pension before and after the extension of the calculation period, the effect of such extension on their pension will be negligible, even if this change lowers their regulatory base.

Chart 1 depicts the average contribution bases (adjusted according to the rules in force and applying the legislation to fill in contribution gaps) in the months immediately prior to taking retirement for the sample of workers considered in this paper and for different groups within such sample. The chart also shows the percentage of workers affected by the maximum pension cap as a function of the number of years considered to calculate the regulatory base.

Chart 1 therefore provides a visual and intuitive picture of how extending the calculation period would affect different types of workers. For example, the fact that the profile of the adjusted contribution bases increases as workers approach retirement means that extensions to the calculation period generally lower the regulatory base and, therefore, the initial pension amount (see Charts 1.1, 1.3 and 1.5). Furthermore, the steeper the slope of this relationship, the more pronounced this negative effect will be. For example, Chart 1.1 points to an extension of the calculation period from 15 to 25 years (i.e. from 180 to 300 months) potentially lowering women's average initial pension more than men's.

4 For further details, see the methodological annex at the end of this paper.

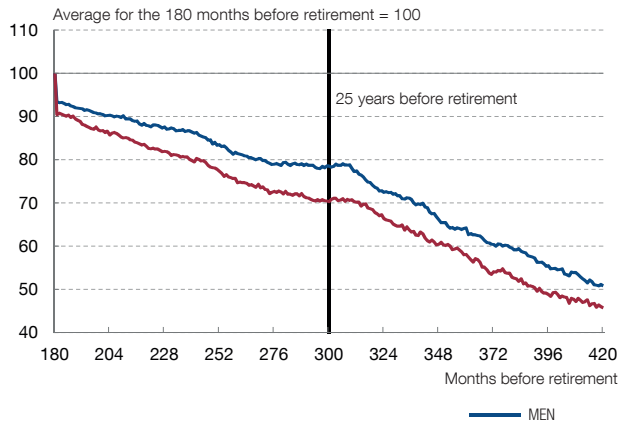
5 In 2022 the contribution bases of the 300 months (25 years) prior to taking retirement are considered. Such contribution bases are divided by 350 to obtain an average for 14 payments per year. The contribution bases of the 24 months prior to retirement are taken at their nominal value. The remainder are adjusted for inflation from the 25th month prior to retirement.

Chart 1

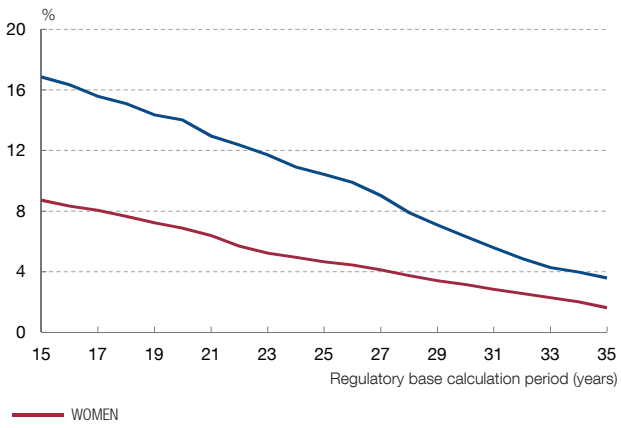
AVERAGE CONTRIBUTION BASE IN EACH MONTH PRIOR TO RETIREMENT AND INCIDENCE OF THE MAXIMUM PENSION BY NUMBER OF YEARS INCLUDED IN THE REGULATORY BASE CALCULATION

A rising contribution base profile over the working life, as observed in the sample of new retirees in 2019, tends to reduce the initial pension benefit when the regulatory base calculation period is extended. By contrast, for pension benefits capped at the maximum amount or topped up to the minimum pension, the impact of extending the calculation period is generally less pronounced.

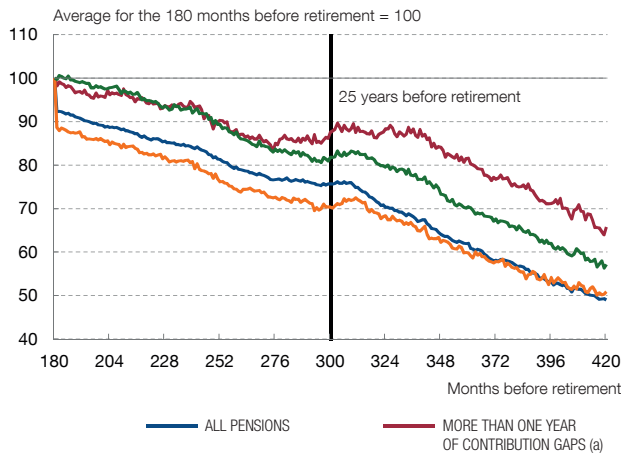
1 AVERAGE CONTRIBUTION BASE, BY GENDER



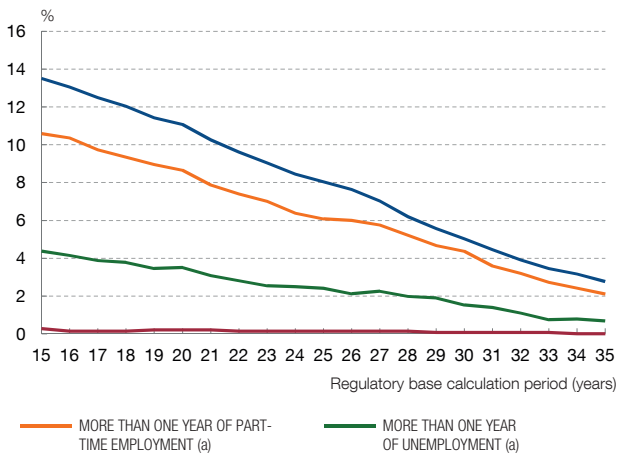
2 INCIDENCE OF THE MAXIMUM PENSION CAP, BY GENDER



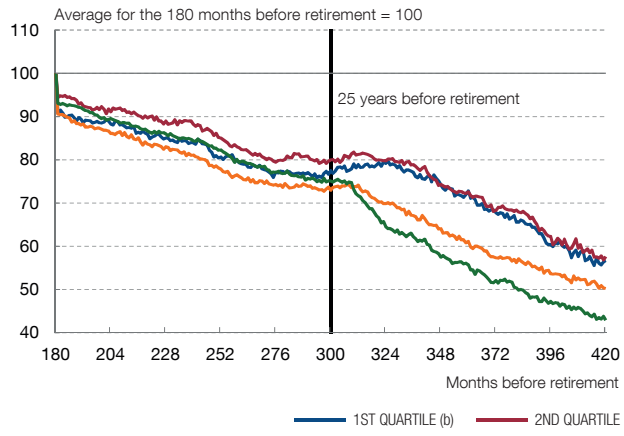
3 AVERAGE CONTRIBUTION BASE, BY EMPLOYMENT HISTORY



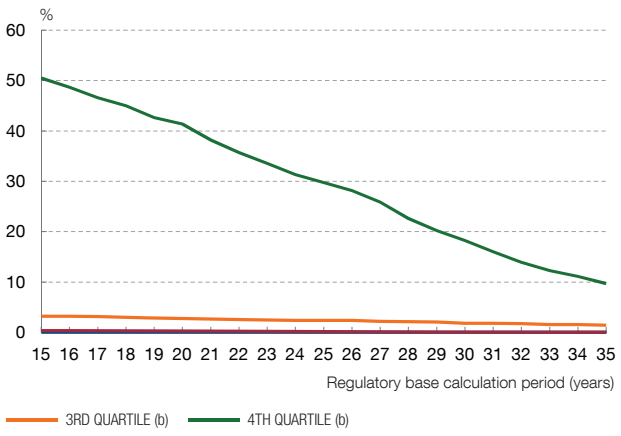
4 INCIDENCE OF THE MAXIMUM PENSION CAP, BY EMPLOYMENT HISTORY



5 AVERAGE CONTRIBUTION BASE, BY INITIAL PENSION AMOUNT



6 INCIDENCE OF THE MAXIMUM PENSION CAP, BY INITIAL PENSION AMOUNT



1ST QUARTILE (b) 2ND QUARTILE (b) 3RD QUARTILE (b) 4TH QUARTILE (b)

SOURCE: Banco de España.

a In the 15 years prior to retirement.
b Pension estimated using a regulatory base calculation period of 15 years.

In addition, were a group of workers to be especially affected by the maximum pension cap, an increase in the calculation period should be expected to be less unfavourable for them than for another group of workers with the same contribution base profile but that was less affected by the maximum pension cap. For example, Chart 1.5 shows that pensioners with pension benefits in the third and fourth quartiles of the distribution have a similar contribution base profile between the 15 and 25 years prior to retirement. However, because a large amount of pensioners in the fourth quartile receive the maximum pension (see Chart 1.6), we can predict that extending the calculation period from 15 years to up to 25 years will have a smaller effect on this group of pensioners than on those in the third quartile.

Chart 2.1 depicts the average initial pension as a function of the number of years considered in calculating the regulatory base for all workers included in the sample. According to the estimation, an increase in the calculation period, from 15 to up to 35 years, results in a monotonic decrease in the average new pension amount, due to workers' upward wage profile (see Chart 1) over the course of their professional career.[6] Specifically, extending the calculation period from 15 to 25 years would be associated with a fall in the average initial pension of 5%, while extending it from 25 to 35 years would reduce it by a further 8.2%.[7] Thus, the marginal effect of extending the calculation period by one year would grow as the number of years considered increases. For example, between 15 and 25 years, one additional year in the calculation period would reduce the initial pension, on average, by 0.5%, whereas between 25 and 35 years one additional year would reduce the initial pension by up to 0.9%.

It should be noted that the aforementioned change in the average initial pension resulting from different regulatory base calculation periods conceals significant heterogeneity across worker and pension characteristics.[8] The remaining panels in Chart 2 explore some of the dimensions of such heterogeneity.

First, in terms of gender, extending the calculation period would affect the average initial pension of women and men similarly. However, the negative effect would be somewhat greater for women where the period is extended from 15 to 25 years and for men where it is extended from 25 to 35 years. Specifically, the change from 15 to 25 years would reduce women's and men's initial pension by 5.4% and 4.8%, respectively, while the increase from 25 to 35 years would be associated with an initial pension 8.1% and 8.3% lower for women and men, respectively (see Chart 2.2). This pattern is consistent with the contribution base dynamics depicted in Chart 1.1. Specifically, compared with the contribution bases in the 15 years prior to retirement, such bases in the 16 to 25 years prior to retirement would be lower for women than for men. However, compared with the period between 16 and 25 years, men's contribution bases in the period between 26 and 35 years decrease slightly more than women's.

6 This monotonic relationship has also been found in the case of the regulatory base with data on new retirees drawn from the 2016 MCVL. See https://alberto-carlos-sabido-martin.shinyapps.io/Pensiones/.

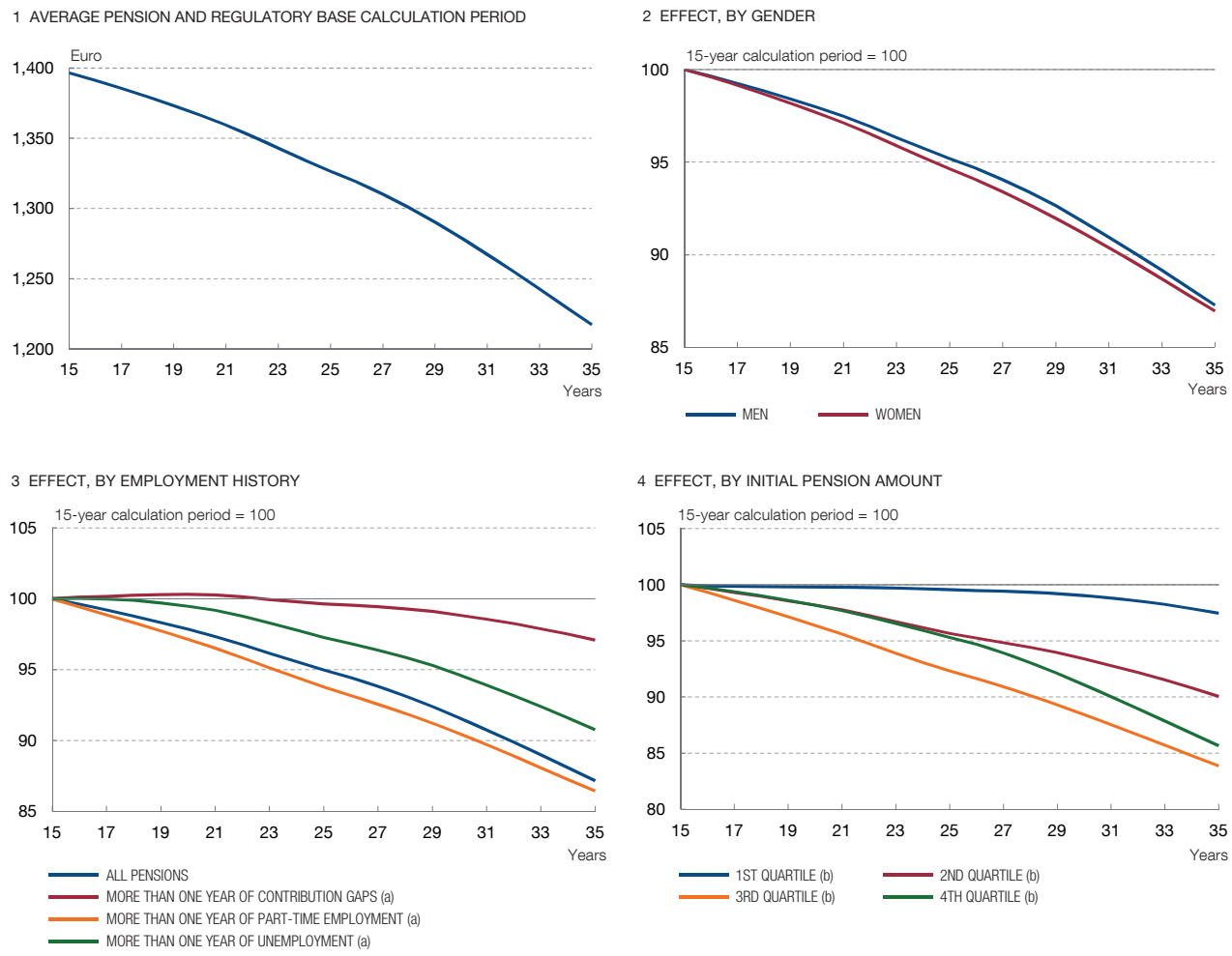
7 Note that the regulatory base calculation period for new retirees in 2019 was 22 years.

8 The initial pension itself is significantly heterogeneous. For example, the standard deviation of the initial pension observed in the sample is somewhat more than 50% of the average.

Chart 2

EFFECT ON THE AVERAGE INITIAL PENSION OF EXTENDING THE REGULATORY BASE CALCULATION PERIOD

In the 15-35 year range, an increase in the regulatory base calculation period is associated with a monotonic decrease in the average initial pension amount. In particular, an increase from 15 to 25 years would reduce the average initial pension by 5%, while an extension from 25 to 35 years would prompt a further reduction of 8.2%. However, the effect is highly uneven when broken down by new retiree characteristics.



SOURCE: Banco de España, drawing on the 2019 MCVL.

a In the 15 years prior to retirement.
b Pension estimated using a regulatory base calculation period of 15 years.

Second, increasing the regulatory base calculation period from 15 to 25 years would have a relatively smaller impact on the initial pension of workers with more than one year of either contribution gaps or spells of unemployment in the 15 years prior to retirement, compared with all pensions and with the pension benefits of workers with more than one year of part-time work in the 15 years prior to taking retirement (see Chart 2.3).[9]

9 According to MCVL documentation, computerised contribution base data have existed since June 1980. Nonetheless, the data prior to 2021 are often missing, and the older the data, the more frequent the data gaps. Therefore, some contribution gaps identified before 2001 may in fact be missing contribution base entries, rather than actual contribution gaps.

Specifically, the initial pension of workers with more than one year of contribution gaps and those with more than one year of unemployment would decrease by 0.4% and 2.7%, respectively, compared with the decrease of 5% in the average initial pension of all new retirees and of 6.2% for part-time workers. These results are once again consistent with the average contribution base dynamics over the course of the working life of the different cohorts analysed. For example, the average contribution base of part-time workers 25 years prior to retirement is 30% lower than their average base in the 15 years prior to retirement, whereas for workers with more than one year of contribution gaps the difference between the contribution bases is much smaller (approximately 15%) (see Chart 1.3). Nonetheless, it should be noted that the marginal effect of increasing the number of years would be particularly high for the group of workers with more than one year of unemployment. As a result, increasing the calculation period from 25 to 35 years would reduce their average initial pension by 7.8%, a figure very similar to that observed for all pensions (8.2%).

Third, extending the regulatory base calculation period would also result in significant heterogeneity across initial pension amounts estimated on the basis of a 15-year calculation period. Specifically, the average initial pension of the retirees in the first quartile would decrease less, while the retirees in the third quartile would see a sharper drop. In other words, extending the calculation period from 15 to 25 years would entail a reduction of 0.5% and 7.7% in the average initial pension of the retirees in the first and third quartile, respectively. The average initial pension would be reduced by a further 2.1% and 9.2%, respectively, were the calculation period to be extended from 25 to 35 years. It should be noted that, in the period between 16 and 25 years, there are no particularly significant differences between the contribution bases of pensioners in the different quartiles compared with the average contribution bases for the 15 years prior to retirement (see Chart 1.5). However, the different incidence of the minimum pension top-ups and the maximum pension cap significantly influences the effect of extending the calculation period. For example, in the exercise, more than 80% of the retirees in the first quartile receive minimum pension top-ups when the calculation period ranges from 16 to 25 years, which largely mitigates the effect of extending the period within this range of years.[10]

In the case of the highest pension benefits (the fourth quartile), the effect of extending the calculation from 15 to 25 years would reduce the average initial pension by 4.7%, less than observed for those in the third quartile. This is because of the incidence of the maximum pension cap among those with the highest pension benefits. Specifically, approximately half of the pensions in the fourth quartile would reach the maximum pension cap if a calculation period of 15 years were taken into account. This percentage falls to around 30% if a 25-year period were considered (see Chart 1.6). However, the marginal effect of increasing the calculation period from 25 to 35 years for pension benefits in the fourth quartile would be more pronounced, as the average initial pension in the fourth quartile would fall by 10.1% (see Chart 2.4). This would be because of the especially steep upward

10 Note that in the simulation minimum pension top-ups are only added to those pension benefits that received them in 2019, due to the amount of those top-ups depending on income limits which are difficult to simulate.

profile of the contribution bases of this group of pensioners in the 26 to 35 years prior to retirement (312 and 420 months before retirement) (see Chart 1.5) and the lower incidence of the maximum pension cap in this range of years.

As pointed out in the introduction, a previous paper by Devesa et al. (2021a) – updated in Devesa et al. (2022) –, uses the MCVL to calculate the effect on the regulatory base of extending the calculation period from 25 to 35 years, exploring the heterogeneity across the observable characteristics both of the workers and of the regulatory base itself. According to their findings, the extension would reduce the average regulatory base by 8.7%. This decline would be more pronounced for workers with short contribution histories (14.7%).[11] It would also be more sizeable for individuals with ordinary or deferred pensions (8.8% and 11.5%, respectively) than for early retirees (7.8%). Likewise, the reduction would be sharper for (i) the self-employed than for individuals under the general regime (declines of 10.2% and 8.5%, respectively), and (ii) women than for men (down by 10.2% and 7.8%, respectively).

Table 1 shows, for the entire sample and for different groups, the distribution of individual changes in the initial pension if the calculation period is extended from 15 to 25 years (Panel A) and from 25 to 35 years (Panel B). For the extension from 15 to 25 years, the average individual change in the initial pension is -4.2%.[12] Overall, 66% of new retirees would receive a smaller pension, 15% would see no change in their benefits (due to minimum pension top-ups and the maximum pension cap) and 19% would collect a higher pension.

By gender, the dispersion in the distribution of changes in the initial pension is greater for men than for women. Thus, although the average drop is somewhat more pronounced for women (4.5% compared with 4% for men), the reduction in the 25th percentile and in the median of the distribution is around 1 percentage point (pp) sharper in the case of men.

By employment record, the effect of the extension from 15 to 25 years would, on average, be slightly positive for workers with more than one year of contribution gaps in the 15 years prior to retirement, increasing their initial pension by 0.4% on average. However, 50% of new pensioners in this group would receive lower benefits, 22% would be unaffected and 27% would collect a higher pension. Workers who have been unemployed for more than one year during the 15 years prior to retirement would experience an average reduction in their initial pension of 1.9%. For workers who have been in part-time employment for more than one year, the average pension decrease would be 5%. In each of the last two groups, 25% of pensions would drop by around 10% or more.

11 Less than 31 contribution years, approximately.

12 Note that the average of the individual changes in the initial pension is -4.2%, whereas the average change in the initial pension, indicated previously, is -5%. The former figure is calculated as the unweighted average of the individual changes in the initial pension, while the latter is the average weighted by the initial pension amount. The fact that the weighted average is lower than the unweighted average indicates that higher pensions experience a more pronounced reduction. Table 1 explores this heterogeneity in more detail.

Table 1

THE UNEVEN EFFECTS OF EXTENDING THE REGULATORY BASE CALCULATION PERIOD

Extending the regulatory base calculation period has uneven effects on pensions by gender, employment history and level of benefits. In particular, part-time workers and retirees with above-median benefits would, on average, see the largest reductions.

			Unweighted individual changes				
	Sample size (number)	Weighted average (e) (%)	Average (%)	Standard deviation (%)	25th percentile (%)	50th percentile (%)	75th percentile (%)
A: From 15 to 25 years							
Total	8,009	-5.0	-4.2	11.8	-10.2	-3.2	0.0
By gender							
Women	3,294	-5.4	-4.5	11.5	-9.6	-2.5	0.0
Men	4,715	-4.8	-4.0	12.1	-10.5	-3.6	0.0
By employment history (a)							
More than one year of contribution gaps	1,435	-0.4	0.4	18.0	-4.0	0.0	0.4
More than one year of part-time employment	1,284	-6.2	-5.0	11.5	-12.1	-3.9	0.0
More than one year of unemployment	2,170	-2.7	-1.9	13.3	-8.9	-2.0	0.7
By initial pension amount (b)							
1st quartile	2,003	-0.5	-0.3	15.8	-3.8	-0.3	0.4
2nd quartile	2,002	-4.3	-3.9	12.2	-11.0	-4.4	1.5
3rd quartile	2,002	-7.7	-7.8	9.6	-14.4	-7.8	-2.3
4th quartile	2,002	-4.7	-4.9	6.5	-8.4	-2.9	0.0
B: From 25 to 35 years							
Total	8,009	-8.2	-7.1	9.9	-12.9	-7.5	-0.6
By gender							
Women	3,294	-8.1	-7.1	9.9	-13.4	-6.3	-0.4
Men	4,715	-8.3	-7.1	10.0	-12.6	-8.1	-1.8
By employment history (c)							
More than one year of contribution gaps	2,722	-2.6	-4.6	12.4	-11.9	-1.1	0.0
More than one year of part-time employment	1,588	-7.8	-6.9	9.6	-13.7	-7.5	-0.2
More than one year of unemployment	2,683	-6.7	-5.6	9.2	-11.3	-6.1	-0.2
By initial pension amount (d)							
1st quartile	2,003	-2.1	-3.2	12.3	-8.9	-0.7	0.0
2nd quartile	2,002	-5.9	-6.3	10.3	-12.1	-7.1	-0.3
3rd quartile	2,002	-9.2	-8.8	7.7	-13.7	-9.4	-4.6
4th quartile	2,002	-10.1	-9.9	7.1	-15.0	-9.4	-4.7

SOURCE: Banco de España, drawing on the 2019 MCVL.

a In the 15 years prior to retirement.
b Pension estimated using a regulatory base calculation period of 15 years.
c In the 25 years prior to retirement.
d Pension estimated using a regulatory base calculation period of 25 years.
e By initial pension amount using a calculation period of 15 years (Panel A) or 25 years (Panel B).

By initial pension amount, the largest negative impact of extending the pension calculation period from 15 to 25 years would be felt by pensions in the third quartile (down by around 8% on average), due to the rising wage profile over the course of a professional career. The highest pensions (in the fourth quartile) also have an upward sloping wage profile, but the average reduction would be tempered by the incidence of the maximum pension cap, as discussed above.

In qualitative terms, lengthening the calculation period from 25 to 35 years would yield similar heterogeneity by gender and employment record (see Panel B of Table 1). Quantitatively, however, the marginal effects would generally be greater. In particular, the initial pension would, on average, be 7.1% lower than one calculated using 25 years:[13] 80% of initial pensions would be lower, 10% unchanged and the remaining 10% would be higher. Once again, part-time workers would, on average, bear the brunt of the effects, although the average change for workers with contribution gaps or spells of unemployment would be similar.[14] In terms of the initial pension amount, the highest pensions would be affected by the largest average reductions (9.9%), since the incidence of the maximum pension cap would be significantly decreased. In particular, of all pensioners in the fourth quartile who would receive the maximum pension based on a 25-year calculation period, barely one-third would continue to do so if that period were lengthened to 35 years. Overall, the inequality in terms of new pension amounts, measured as the P90/P10 ratio of the initial pension distribution, would decline from 4.02 (when the calculation period is restricted to the 25 years prior to retirement) to 3.84 (calculation period extended to 35 years).

13 Note, once again, that the unweighted average change is -7.1%, while the change in the average initial pension, i.e. the average change weighted by the initial pension amount, is -8.2%.

14 In this case, employment record characteristics are measured during the 25 years before retirement. For instance, workers are deemed to have experienced a spell of unemployment when they have been unemployed for more than one year in the 25 years leading up to retirement.

3 Effect on the initial pension of limiting the calculation period to the best contribution years

Chart 3.1 shows the average pension level under a mechanism that calculates the regulatory base taking only the best contribution years of the 35 leading up to retirement.[15] The horizontal axis shows the number of best years computed. For instance, if the best 25 of the last 35 contribution years were used, the average initial pension would amount to €1,382. Meanwhile, a calculation based on the best 34 years (disregarding only the 12 worst contribution months) would result in an average pension of €1,238. Note that the last data point in Chart 3.1 represents the average initial pension if the regulatory base were calculated using the best 35 of the last 35 contribution years. This is one of the examples used in Section 2 (i.e. a 35-year calculation period) and would result in an initial pension of €1,217.

Chart 3.2 plots the difference between the average initial pension calculated using the last 25 years of working life and that calculated taking different numbers of best contribution years of the 35 prior to retirement (horizontal axis). As the chart shows, in terms of average initial pension, a mechanism that takes the best 29 contribution years of the last 35 would be equivalent to one using the last 25 years' contribution bases. Thus, calculation formulae under which more than six of the worst contribution years (out of the last 35) can be disregarded would give a higher average initial pension than one based on the last 25 contributory years (in Chart 3.2, the bars in positive). Conversely, if less than six of the worst contribution years were excluded from the calculation period, the average initial pension would be lower (bars in negative).[16] In particular, if the 12 worst contribution months could be disregarded from the regulatory base calculation, i.e. only the best 34 of the last 35 contribution years were used, the average pension of new retirees would be 6.7% lower than under a mechanism using the last 25 contribution years. However, it would be 1.7% higher than based on a calculation period restricted to the last 35 contribution years (i.e. with no option to disregard the lowest contributions).

Table 2 sets out the uneven impact that these mechanisms would have, showing the average pension for different groups using a calculation formula that takes into consideration the best 25 (Panel A) and the best 29 (Panel B) contribution years of the 35 prior to retirement, compared with the average pension calculated using the last 25 contribution years.

As Panel A illustrates, selecting the best 25 contribution years of last 35 would, on average, result in a pension that is 5.3% higher than one calculated using the last 25 years prior to retirement. The groups most benefited are retirees with more than one year of contribution gaps or unemployment spells in the 25 years prior to retirement (average

15 The monthly contribution bases, adjusted according to the current rules, are ordered from largest to smallest, and those that contribute the largest amount to the regulatory base calculation are used. The contribution gaps, which are filled in accordance with the current legislation, are only included in the regulatory base calculation (from largest to smallest) after the actual contribution bases are included. In other words, they are only used if there is a shortfall between actual contribution bases and the number of best years used to calculate the regulatory base.

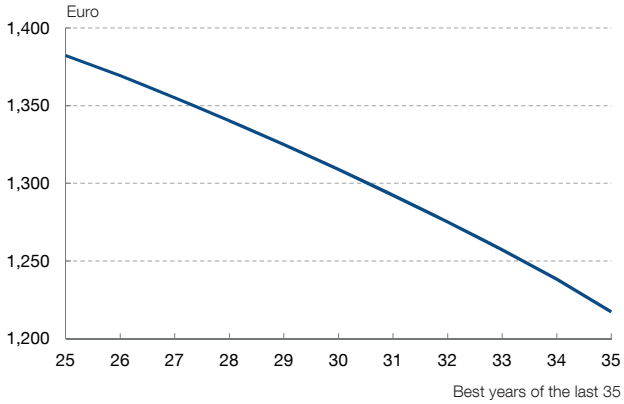
16 In terms of the average regulatory base, Devesa et al. (2022) find that taking the best 29 years and 5 months of the last 35 contributory years would be equivalent to using the last 25 contribution years.

Chart 3

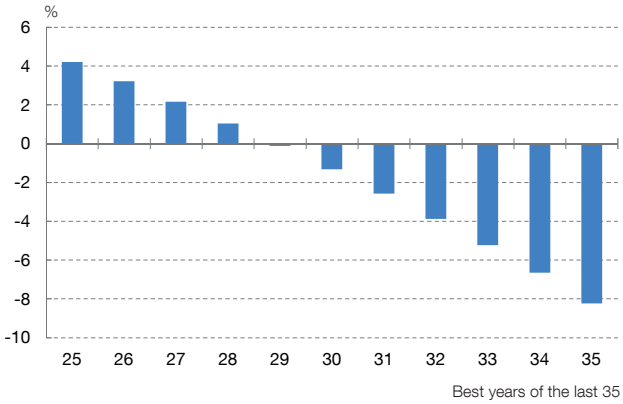
EFFECT ON THE AVERAGE INITIAL PENSION OF SELECTING THE BEST CONTRIBUTORY YEARS FOR THE REGULATORY BASE CALCULATION PERIOD

Compared with a mechanism that averages the contribution bases of the last 25 years, one that disregards the 12 worst contributory months of the 35 years prior to retirement would be associated with an average initial pension that is 6.5% lower. However, that pension would be 1.7% higher than if the calculation period were extended to the last 35 years of contributions. Generally speaking, calculation formulae under which more than six of the worst years (out of the last 35) can be disregarded would yield a higher average initial pension than one that takes the last 25 contributory years.

1 AVERAGE PENSION AND NUMBER OF BEST YEARS (OF THE LAST 35) CONSIDERED FOR THE REGULATORY BASE CALCULATION PERIOD



2 DIFFERENCE VS A CALCULATION BASED ON THE LAST 25 YEARS



SOURCE: Banco de España, drawing on the 2019 MCVL.

increase in the initial pension of 8.2% and 7.7%, respectively), and pensions in the second quartile (average increase of 7.3%).

If the 29 best years of the last 35 were used, the average change vis-à-vis a calculation using the 25 years prior to retirement would be slightly positive (0.8%) (see Panel B of Table 2). However, the effects would be uneven. For example, more than half of the pensioners would receive lower benefits (compared with a calculation based on the 25 years prior to retirement). Meanwhile, the average individual change would be more positive in the case of workers with more than one year of contribution gaps (2.8%) or unemployment spells (2.5%), and for pensions in the first quartile (2.3%) and in the second quartile (2.2%). Under this mechanism, the inequality in terms of new pension amounts, measured as the P90/P10 ratio of the initial pension distribution, would be lower than if the calculation period were restricted to the last 25 years prior to retirement (3.94 versus 4.02), but somewhat higher than one based on the last 35 years of working life (3.84, as noted above).

The paper by Devesa et al. (2021b), updated in Devesa et al. (2022), addresses the effects on the regulatory base of limiting the calculation period to the best 25 of the 35 years prior to retirement. According to their results, the average regulatory base would increase by 5.6% compared with a 35-year calculation period. By type of worker, the largest increase would be experienced by workers with the lowest contribution bases (11.8%), the fewest contribution years (7%) and those taking later retirement (6.9%).

Table 2

CALCULATING THE REGULATORY BASE USING THE BEST CONTRIBUTION YEARS OF THE 35 PRIOR TO RETIREMENT HAS UNEVEN EFFECTS ON INITIAL PENSIONS

If the best years of contribution were taken into account, workers with contribution gaps or spells of unemployment, along with pensions in the first and second quartiles, would see the largest average improvement.

Differences vs a calculation based on the last 25 contributory years

			Unweighted individual changes				
	Sample size	Weighted average change (c)	Average	Standard deviation	25th percentile	50th percentile	75th percentile
	(number)	(%)	(%)	(%)	(%)	(%)	(%)
A: 25 best contributory years							
Total	8,009	4.2	5.3	11.6	0.1	1.0	5.3
By gender							
Women	3,294	3.6	4.2	10.3	0.0	0.5	3.5
Men	4,715	4.5	6.1	12.3	0.1	1.4	6.9
By employment history (a)							
More than one year of contribution gaps	2,722	8.4	8.2	16.2	0.0	0.9	10.0
More than one year of part-time employment	1,588	4.7	5.5	11.0	0.0	1.1	6.0
More than one year of unemployment	2,683	7.0	7.7	11.6	0.4	3.3	10.3
By initial pension amount (b)							
1st quartile	2,003	5.5	6.1	16.7	0.0	0.1	2.8
2nd quartile	2,002	7.3	7.3	12.3	0.2	2.2	9.4
3rd quartile	2,002	5.8	5.9	8.6	0.7	2.5	7.8
4th quartile	2,002	1.8	1.9	3.9	0.0	0.5	1.9
B: 29 best contributory years							
Total	8,009	-0.1	0.8	10.1	-3.5	-0.3	1.1
By gender							
Women	3,294	-0.6	0.0	9.1	-3.5	-0.3	0.2
Men	4,715	0.1	1.4	10.7	-3.5	-0.4	2.0
By employment history (a)							
More than one year of contribution gaps	2,722	2.5	2.8	13.9	-2.0	0.0	3.4
More than one year of part-time employment	1,588	0.0	0.6	9.6	-4.1	-0.2	1.0
More than one year of unemployment	2,683	2.0	2.5	10.0	-2.8	0.0	4.8
By initial pension amount (b)							
1st quartile	2,003	2.0	2.3	14.0	-1.4	-0.1	0.2
2nd quartile	2,002	2.1	2.2	10.9	-3.2	-0.3	4.2
3rd quartile	2,002	0.3	0.4	7.8	-4.2	-1.1	2.4
4th quartile	2,002	-1.7	-1.7	4.5	-3.9	-1.3	0.0

SOURCE: Banco de España, drawing on the 2019 MCVL.

a In the 25 years prior to retirement.
b Pension estimated using a regulatory base calculation period of 25 years.
c By initial pension amount using a calculation period taking the 25 best years (Panel A) or 29 best years (Panel B).

4 Conclusions

The results of the analysis show, in the 15-35 year range and for the sample of new retirees in 2019, a monotonically decreasing relationship between the average initial pension and the number of years used in the regulatory base calculation period. Further, the longer the calculation period, the steeper the decreasing function. Looking at the different groups, the reduction in the average initial pension (as the number of years used in the calculation increases) is larger for workers that have longer spells of part-time employment in the 15 years prior to retirement and for above-median pensions. By gender, the effects would be similar for men and women. As regards inequality, extending the calculation period from 25 to 35 years would be associated with less disparity between the benefits in the 90th and 10th percentiles of the distribution.

The possibility of disregarding the worst contribution years when calculating benefits could temper the drop in the average pension caused by extending the calculation period. Specifically, compared with a mechanism taking into account the last 25 years before retirement, a calculation using the best 25 to 28 years of the 35 leading up to retirement would yield a higher average initial pension. However, a calculation period taking the best 30 to 34 years would result in a lower average initial pension. A methodology taking the best 29 years of the last 35 would, in terms of the average initial pension, be roughly equivalent to one using the 25 years prior to retirement. As regards heterogeneity, the possibility of disregarding the worst years in the pension calculation would be relatively beneficial for workers with contribution gaps or spells of unemployment and for pensions below the median, meaning slightly less inequality in new benefit amounts than under a mechanism using the last 25 years prior to retirement.

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Methodological annex

The first step in the exercise is to replicate the pension amount for new retirees observed in the 2019 MCVL based on the contribution records and the pension characteristics determining that amount.

The benefit amount is roughly calculated as:

$$P = BR \times PCTB + C$$

where P is the pension amount, BR is the regulatory base, PCTB is the percentage applied to the regulatory base and C are the supplements.

The regulatory base is the average contribution base during the years immediately prior to retirement, adjusted for CPI inflation up to 24 months before retirement. The number of years included in the regulatory base calculation was extended from 15 years in 2012 to 25 in 2022. In the simulation exercise, the number of years included ranges from 15 to 35.

The most complex aspect of the simulation is replicating the regulatory base using contribution records, given the special treatment accorded to contribution gaps and spells of multiple job-holding, multi-activity and part-time employment. These and other factors introduce a (potentially wide) margin of error between the regulatory base observed in the MCVL and that calculated using contribution records. Even for new retirees with no such spells in their employment history, the base calculated does not generally coincide with that observed in the MCVL, although the margin of error is far smaller.

The percentage applied to the regulatory base essentially depends on the contribution years and the retirement age. The simulation exercise takes the value of this variable observed in the MCVL.

The amount resulting from multiplying the regulatory base by the applicable percentage is limited by a series of factors. First, broadly speaking, it cannot exceed the maximum pension amount (€2,659.41 in 2019). Second, it is generally halved if the new retiree collects the pension benefit while employed or self-employed. Third, if the new pensioner collects other pensions, the sum total may not exceed the maximum pension amount. Fourth, some pensions are recognised under international regulations, which affects their amount. The simulation exercise incorporates these four elements into the pension calculation, either directly because they are observed in the MCVL, or based on estimates obtained from other sample variables.

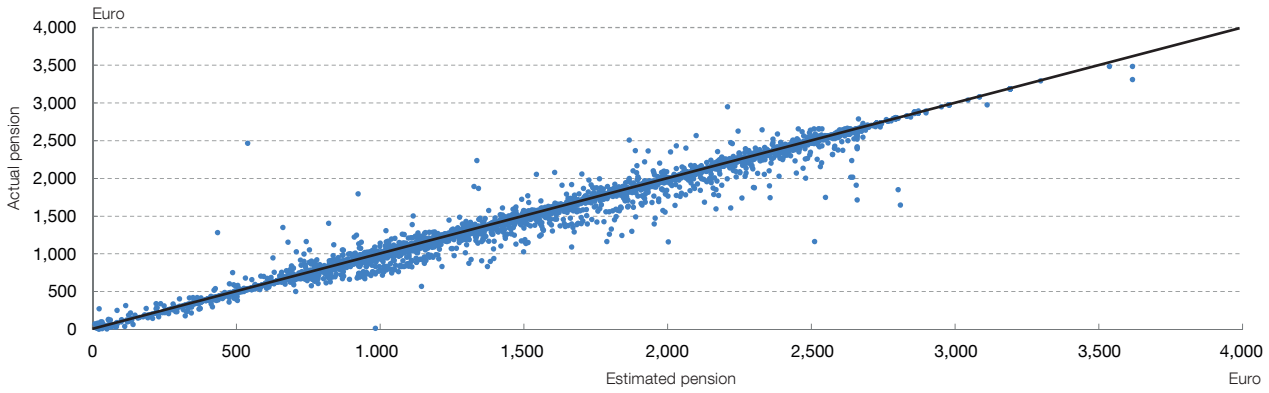
Lastly, a series of supplements may be added, on top of the amount resulting from multiplying the regulatory base by the applicable percentage, once the aforementioned limitations are taken into account. There are several types of supplement. First, minimum pension top-ups are provided to ensure a minimum level of benefits if the pension amount

Chart A1.1

SIMULATION OF INITIAL PENSION AMOUNTS FOR NEW RETIREES IN 2019. GOODNESS OF FIT

Given the wide range of factors included in the pension calculation, replicating their amount based on contribution records is the most complex aspect of the simulation exercise. For 89% of the sample the estimation error is lower than 5% in absolute value.

RELATIONSHIP BETWEEN THE ACTUAL PENSION AND THAT ESTIMATED BASED ON CONTRIBUTION RECORDS



SOURCE: Banco de España, drawing on the 2019 MCVL.

stands below a particular threshold and certain requirements are met. Second, a late retirement supplement may be applied and can result in benefits above the maximum pension, meaning that, de facto, this cap does not apply in such cases. Third, from 2016 women receive a pension supplement based on the number of children raised. This supplement is calculated as a percentage of the regulatory base multiplied by the applicable percentage, and may cause the pension received to exceed the maximum pension amount (although in this case the supplement is reduced).[17]

Again, the simulation includes these three supplements in the pension calculations. Minimum pension top-ups are only added to pensions that received them in 2019, since they are associated with certain income limits that are not easy to simulate. The calculation thus ignores the potential top-ups that might be disbursed to pensioners who, as a result of the change in the regulatory base calculation period, would now be eligible for minimum pension top-ups. The other supplements mentioned above are estimated based on a series of MCVL variables. The simulation also takes into account that the total pension amount cannot exceed the maximum contribution base (€4,070.1 in 2019).

Chart A1.1 shows, for each pension, the actual amount in the MCVL and the amount estimated based on contribution records and other sample variables. The dotted line is the 45-degree diagonal. For 89% of pensions the estimation error is below 5% in absolute

17 The maternity supplement was recently amended by Royal Decree-Law 3/2021 of 2 February 2021 adopting measures to reduce the gender gap and on other Social Security and economic matters. The supplement is included in the simulation based on its 2019 configuration.

value. In the case of new retirees with no contribution gaps or spells of part-time work, multi-activity or multiple job-holding (29% of the total), the percentage rises to 99%. The estimated average initial pension amounts to €1,351, compared with an actual average pension of €1,342. In other words, the average pension is overestimated by 0.7%. The 25th, 50th and 75th percentiles of the estimated initial pension are 0.9%, 0.8% and 1.1%, respectively, higher than those same percentiles observed in the MCVL.

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