Impact evaluation of the 1993 French pension reform on retirement age

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Abstract This paper offers the first *ex post* evaluation of the incentive effects of the 1993 French pension reform. We use administrative data in order to assess how individuals have reacted to changes in incentives to delay retirement. We take advantage of the fact that different groups were affected differently by the reform in order to identify precisely the behavioural impact of changing incentives. We find that one additional quarter of necessary contribution led to an average increase of 1.5 months in retirement age, corresponding to a coefficient response of 0.54. Moreover, we show that the reform has also encouraged individuals to claim more disability pensions and to find additional quarters of past contribution.

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Introduction

In order to cope with the financial pressure of increasing life expectancy, the French pension system has been reformed twice so far, in 1993 and 2003, and further changes are already being discussed. The 1993 reform was meant both to reduce the replacement rate and to increase the retirement age of private sector employees. This paper focuses on measuring the incentive effects of the 1993 reform on retirement age. This type of evaluation is crucial to better understanding how pension reforms can help increase retirement age. A longer and more detailed version of this work can be found in Bozio.^{1,2}

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The 1993 French pension reform

The complexity of the French pension system has always been a nightmare for an international (or indeed domestic) audience not familiar with its intricacies. We will not dwell here on these complexities^{1–3} but a short presentation is in order, as it will help make sense of the empirical strategy used in this paper.

Although there exist in France many different public pension schemes according to employment status, we will concentrate our overview on wage earners in the private sector, representing a large part of the French population, and — for our purpose — the only one affected by the 1993 reform. The pension of these individuals relies on two pillars. The first one is the Social Security pension, called 'regime general' (or Caisse nationale d'assurance vieillesse, CNAV). It is a pay-as-you-go pension scheme that offers

earnings-related pension under the so-called 'social security ceiling' (approximately the average wage). The maximum replacement rate is 50 per cent of an average of earnings under the ceiling. The second pillar comes from various schemes called 'complementary schemes', which are mandatory schemes that depend on employment status (one for executive employees and another for blue-collar workers and executives below the ceiling). These schemes provide higher replacement rates below the ceiling and some substantial pension up to eight times the average wage. There are also financed in a pay-as-you-go manner.

The 1993 reform only changed the rules of the 'regime general' so we will describe its benefit formula in more detail. The scheme is basically a defined benefit, although the generosity of the benefits has been changed every decade since its conception in 1945. Two pension reforms (1971 and 1982) have increased the generosity of the scheme, while the two more recent ones (1993 and 2003) have tended to reduce it. The pension offered before 1993 was 50 per cent of the average earnings of the best ten years conditional on being 65 or having contributed 37.5 years. The pension was available at age 60 and each year of missing contribution or number of years before 65 led to a reduction of the replacement rate of 10 per cent. This was a relatively high penalty for early retirement (higher than actuarial adjustment) for those could not validate the required length of contribution. To compute the reference wage, earnings were converted to present value using average earnings growth rates up to 1986 and then prices.

In 1993, the government introduced three changes to this benefit formula. First, it increased the number of years included to compute the reference wage from the best ten years to the best 25 years of earnings. This automatically reduced the average wage used in the formula and led to a sharp reduction of the actual replacement rate. The change was progressively implemented with an increase of one year for each cohort, that is, ten years for those born before 1933, 11 years for those born in 1934 and 25 years for those born after 1948. The drop in replacement rate is higher

for younger cohorts and for those with ascending earnings profiles.

The second measure was to confirm in the law the change to price indexation. This also leads to a reduction in benefits when wage growth is higher than inflation. In that respect, the 1993 reform was not a major break with the past, as price indexation had been in place since 1987, albeit in a discretionary manner.

Although it is the first two measures that account for the largest part of the anticipated deficit reduction of the scheme, it is the third measure that will be the focus of this paper. Its main aim is not to reduce benefit, but to provide incentives to delay retirement. It consisted in increasing the required length of contribution from 37.5 to 40 years. The reform was also phased in with one additional quarter for each cohort, that is, 150 quarters of required contribution for those born in 1933, 151 for those born in 1934 and 160 quarters for those born in 1944.

In 2003, another reform applied the 1993 changes to the public sector and made further modifications to the retirement incentives of the 'regime general'. In particular, it reduced the penalty for early retirement from 10 to 5 per cent, while introducing a bonus for delayed retirement. A further increase in the required length of contribution to 41 years has been confirmed by a 2008 reform.

Why the *ex post* evaluation of the 1993 reform is important?

It might seem at first that the 1993 reform is ancient history. Fifteen years after its introduction, the public debate has shifted to more recent reforms and their evaluation. The problem is that only *ex ante* evaluations are possible in the short term. Pension reforms are usually phased in over a long period and there might be a considerable number of years until a cohort has completely retired and data are available. Concerning the 1993 reform, the only analyses thus far were *ex ante* evaluation where the behavioural impact of the reform was either assumed⁴ or calibrated.⁵ With a 10 per cent replacement rate reduction

for each missing year, the incentive to delay retirement until the full-rate was very high and thus most work on the *ex ante* evaluation of the 1993 reform assumed that individuals would delay retirement until they reached the full-rate, that is, either with the required length of contribution or automatically at age 65.

These micro-simulation studies were very interesting at the time because they provided an assessment of medium-term impact of the reform. But they could not provide very accurate measures of the impact of incentives' changes, as they had to use hypotheses concerning behavioural preferences as inputs. To date, the best estimate of preferences of French individuals concerning retirement comes from the study of Mahieu and Blanchet,⁶ who estimated an option value model following Stock and Wise⁷ using cross-sectional data. Their estimates are dependent on the low variations within a cohort that are the results of the incentives structure pre-1993. They have no data on changes in behaviour introduced by the 1993 reform.

In this respect, *ex post* evaluations of the changes in retirement incentives are crucial. They are not only essential in helping to calibrate micro-simulation models but also in informing practitioners and politicians about the scope for changes in incentives. In France, the pension debate opposed for a long time two opposite views. Some believed that increased incentives to delay retirement would not lead to any change but a reduction in benefits. Others — mostly economists — predicted a one for one increase in retirement age with the increase in the required length of contribution, ie, a significant elasticity of labour supply at older age.

Our paper is based on the use of administrative data from the 'regime general' scheme. These data are very precise on the key variables necessary to compute pension entitlements, but also completely comprehensive, as we have at our disposal information on more than 1.3 million individuals who have retired between 1994 and 2003. They were never used by economists in large part because access to them was difficult, but also because as administrative data they did not provide many other variables. Although this

does not present a problem for estimating the impact of the reform, it will limit the interpretation of the results — we do not have detailed information on the characteristics of those who delay or do not delay their retirement.

Evaluation method

Our objective is to estimate the degree to which the increases in the required quarters of contribution mandated by the 1993 reform led to increases in the age of retirement. However, estimation of the impact of the increase in required length of contribution is subject to two identification problems. First, the increase is highly correlated with a reduction in the replacement rate (due to changes in the reference wage formula) and with the secular trend in declining retirement age. Simple time difference estimation would lead to biased estimates of the elasticity. Secondly, the length of contribution is itself an endogenous variable: persons who have started to work early in life are more likely to retire early.

The progressive implementation of the 1993 reform offers a double variation to identify the pure impact of the reform, which depends on both year of birth and quarters of contribution. It incidentally creates treated and control groups. For instance, individuals born in 1934 are all required to have 151 quarters of contribution to receive full-rate benefits. For those who already had 151 quarters of contribution at age 60, the reform does not change the incentives. On the contrary, for those who reach 60 with only 150 quarters of contribution, they face the choice of either postponing retirement or a 2.5 per cent reduction in benefits. The difference-in-difference strategy controls for both cohort effect and length of contribution effect.

For this methodology to be robust, the reform should not affect treated and control groups. We also have to check that no pre-existing trend in retirement pattern could be wrongly attributed to the reform. The great advantage of the phasing in of the 1993 reform is that it has created numerous treated and control groups that provide exogenous variations in the generosity of benefits

and thus allows us to estimate the labour supply elasticity of older workers.

Results

Three major results stand out from this analysis: the 1993 reform has led to increased claims of disability pension; individuals have tried to validate forgotten quarters of contribution; and the 1993 reform has led to a significant increase of retirement age for those affected, but in a lesser margin than what was expected, that is, less than one-for-one postponement.

The first result concerns the impact of the reform on disability pension. The 'regime general' has different types of pension: the normal pension, a disability pension (or unfitness for work), war pension (former prisoners of concentration camps or veterans) and some other special pensions (for mothers working in factories). The special pension types offer full-rate pension at the age of 60 without any length of contribution requirement. By increasing this requirement, the 1993 reform has led to a disclosure effect: individuals who had more than 150 quarters of contribution and could have claimed disability pension would not have done so before the 1993 reform (it takes effort to apply to these special pensions) as there was no return to doing so. With the reform, there is an incentive not only to delay retirement but also to claim these special pensions. According to our estimates, the probability of receiving a disability pension is 2–4 per cent higher for individuals affected by the reform than for those not affected.

The same disclosure effect can be detected for the length of required contribution. To validate a pension, the individual must provide the 'regime general' (or its staff has to ask employers) with proofs of contribution. Once the amount of required contribution is reached, there is no need to spend time and effort in finding other past contributions (like internship or jobs at an early age). With the reform, some individuals might just make an effort to look for additional quarters of contribution. This disclosure effect is maximal for those individuals who are affected at the margin (with one or two quarters missing) and almost nonexistent for those individuals who had already

made a search effort because they lacked quarters of contribution before the reform.

The last and most important result of this analysis is the measure of the retirement age response rate following an increase in the required contribution length. We regress the retirement age on dummies for length of contribution at age 60 and interactions between the year of birth and the length of contribution. The interaction coefficients represent the true impact of the increase in the required contribution length. We reproduce them in Figure 1 for the cohorts born in 1935, 1936 and 1937. The baseline is the cohort 1934, which had to validate 151 quarters of contribution. The 1935 cohort receive a full-rate pension conditioning on 152 quarters of contribution, the 1936 conditioning on 153 quarters and the 1937 cohort on 154 quarters. The individuals who at age 60 have higher contributions than the required length are not affected by the reform (right-hand side of Figure 1). The average retirement postponement for the 1935 cohort is 0.65 (for an increase of one quarter) and for the 1936 cohort is 1.2 (for an increase in two quarters).

The reform has thus led to a significant delay of the retirement age for those affected by the reform. But given the high penalty at the time (10 per cent for each missing year, reduced to 5 per cent since 2004), one would have expected a higher number (closer to one). One added problem comes for the fact that administrative data do not give information on the employment status of the individual before he/she retires. As it is possible to validate quarters of contribution while benefiting from early retirement schemes, 0.65 might be an overestimation of the true effect of the reform. By supposing that early retirees are all claiming their pension at the full rate, we can estimate a lower bound at 0.54, that is, for each year of increase in contribution length, individuals delay retirement by around six months.

If these estimates are lower than what was expected, they exhibit a significant behavioural reaction: individuals do indeed respond to the incentives to delay retirement. At the macro level, however, the average retirement age in France has not increased very significantly. It is simply

Figure 1: Impact of the increase in the required contribution length on retirement age

Source: administrative data from the CNAV, computations from the author.

Notes: The coefficients presented here are the coefficients from the interaction of year of birth and length of contribution at age 60 on the retirement age. They are expressed in quarters, that is, an increase of one quarter of required contribution leading to an average increase of one quarter in the retirement age would thus lead to a coefficient of 1. The coefficients are plotted for different cohorts and along the length of contribution at age 60.

because the share of individuals really affected by the change incentives has been very small. Only 18 per cent of the cohorts we study have been affected by the reform, that is, those who had between 131 and 160 quarters of contribution at age 60. Those who had more than required had the full rate anyway, and those who had less had the minimum rate. Within this 18 per cent, some have been able to draw a disability pension, some to validate additional quarters of contribution and some were in early retirement schemes where they could validate quarters of contribution without being employed.

How to explain these results?

The fact that early retirement and unemployment schemes reduce the net impact on labour force participation of any pension reform will not come as a surprise. The mere fact that a large minority of French workers have retired as soon as possible even with a very strong penalty (10

per cent reduction of their benefit) is, however, puzzling for our understanding of retirement behaviour.

There are many possible explanations for this under-postponement. First, even if wage earners have no interest in retiring before they can obtain a full pension, they might be forced to do so by their employers. Labour law, however, provides substantial protection for workers who have not reached the full-rate pension age. Penalties for early layoffs in this case are very high and this explanation is thus unlikely. A second class of possible explanations involves the supply side. Some workers may have stronger preferences for leisure that lead them to retire as soon as possible. Others may lack information concerning pension formulae. As the computation of the pension is quite complex, it is possible that some people do not understand the importance of the penalty for early retirement and choose to follow a rule of thumb, for instance either retiring as soon as

possible or retiring with a full pension. A third explanation may involve liquidity constraints for inactive people waiting for retirement. Another possible explanation for our under-postponement puzzle may involve heterogeneity of life expectancies. A penalty we call 'actuarially fair' is indeed computed using average life expectancy by cohort, whereas life expectancies vary considerably within each cohort. If some people know that their life expectancy is shorter than the average, they will retire as soon as possible even if the penalty is higher than actuarially fair.

Our data set, although rich, does not have enough variables to allow us to discriminate between possible explanations.

Conclusion

This paper offers the first *ex post* evaluation of the incentive effects of the increase in required length of contribution, which was one of the features of the 1993 French pension reform. This private sector reform was meant both to reduce replacement rates and to increase retirement age. In order to induce later retirement, the government increased the number of quarters of contribution necessary to obtain a full-rate pension from 150 to 160 quarters.

We use comprehensive administrative data from the 'regime general' in order to estimate the response of retirement age to the length of contribution necessary to obtain a full pension from the general retirement scheme (CNAV). We use the fact that different groups were affected differently by the reform (depending both on birth year and contribution length at age 60) in order to identify precisely the behavioural impact of changed incentives, using a difference-in-difference approach. We find that

one additional quarter of necessary contribution led to an average increase of 1.5 months in retirement age, corresponding to an elasticity of 0.54. This fairly high response should be considered in the light of the high level of penalty associated with early retirement in the French pay-as-you-go scheme. In view of this high penalty, some authors have assumed that the response coefficient of retirement age should be equal to 1.

In addition, we show that, when possible, workers used other possibilities to leave at 60, by either making efforts to produce evidence of longer carriers, or asking more frequently for a disability pension. The 1993 reform has increased the probability of retiring with a disability pension by 2–4 per cent, according to our estimates.

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