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**Social Security and Early Retirement: The Relationship between
Workers, Firms and Government**

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1 Introduction

In most industrialized countries, the labor force participation and the employment rates of older workers have considerably declined since the 1970s. At the same time population aging has become one of the most important social and economic challenges for the next decades. Life expectancy has been increasing markedly for more than a century, while fertility has been declining. These elements together imply a great uncertainty concerning the long-term sustainability of social security systems.

Considerable attention has been devoted to these issues both by policy-makers and researchers. An extensive literature has been dedicated to the analysis of the labor force participation of older workers. In recent years, hundreds of studies have described the evolution of the early retirement process and have tried to understand the underlying explanatory mechanism. The role of social security schemes in inducing early exit from the market has long been highlighted. The evolution of labor force participation is clearly related to the various exit pathways and their successive openings. In all industrialized countries, we find public pension systems

to support people in their old age but in addition to the standard age of retirement, which is around 65 in OECD countries; flexibility is allowed in accessing pensions with or without adjustment in the value of retirement income. Furthermore, in most countries, several other public schemes exist, which allow people to leave their jobs earlier than the mandatory age of retirement.

However, if the decrease in the labor force participation of older workers is directly related to the emergence of a number of programs allowing workers to exit the labor market, we may question why these programs exist. Most people who are knowledgeable about national social security systems recognize that these systems will have to be reformed to increase labor force participation and to restrain the growth of future costs. However, the reforms that are needed seem to be delayed. The main contribution of this paper is to highlight the role of public policy through early retirement schemes as well as the demand for labor in order to better understand the low labor force participation of older workers. Many studies have focused on labor supply as a response to early retirement incentives coming from social security schemes. However, a growing literature has started to focus on the labor demand for older workers. Indeed employers have been active in forcing older individuals out of work. Because of the wage-productivity gap or labor market rigidities, the demand may be low and employers who wish to separate from older workers may use early retirement schemes as a workforce management tool. In this respect, a previous study by Anderson et al. (1993) highlighted the role of employer-sponsored group pensions as a labor market institution. In this paper, we concentrate on the role of social security schemes.

We propose to relate some theoretical arguments to empirical evidence in order to identify the role of publicly-provided early retirement schemes in the labor market. Section 2 shows how social security schemes may induce the early exit of older workers. Then Section 3 introduces the role of employers in inducing

early retirement. We analyze the role of early retirement schemes in workforce management by firms and we demonstrate the perverse effect of the mainly public financing aspect of these schemes. Finally, in Section 4, we explore the reasons pushing governments to support early retirement. Section 5 concludes.

2 Does social security induce early retirement?

An analysis of early retirement behavior is an analysis of the labor force participation of older workers. The theoretical framework is the standard model of time allocation, in which an individual chooses between work and leisure, given a fixed budget. The worker determines the age of exit from the labor market but the choice may be affected by social security benefit provision. Indeed the benefits the workers are entitled to at an older age can affect labor supply in three ways. First, they affect the lifetime wealth of the workers. This may induce earlier withdrawal from the labor force than would have occurred without the benefit schemes. Second, they provide earnings replacement at an early age of entitlement. Workers with short-time horizons or high rates of time preference often accumulate little savings. They may decide to retire when the benefits provided are high enough so that they do not experience a large reduction in consumption if they stop working. Third, they can influence the net return from working an additional year. By working one more year, the worker becomes entitled to some additional income later on but at the same time she forgoes the benefit income of that year. Depending on the social security features, this may increase or decrease the incentive to work. These three effects result in what may be called the implicit tax on continued activity (Burtless, 2004). Such a tax constitutes an incentive to early retirement for older workers.

2.1 A model of retirement choice

As a starting point, let us consider a basic model that enables us to understand induced retirement behavior. In this respect we rely on the useful synthesis done by Fenge and Pestieau (2005). We consider an overlapping generations model wherein people live for two periods. In the first period, people are fully active. This is our period of reference. They consume c_t and supply an amount of labor l_t . In the second period, they consume d_{t+1} and work a fraction z_{t+1} of that period with a labor supply h_{t+1} . We normalize each period to 1 and call z the age of retirement. The workers differ in labor productivity given by w^i with probability π^i and the interest rate is given by $r = R - 1$. For sake of simplicity, we use the operator E for $\sum \pi^i$. Population grows at a constant rate n . Thus individuals preferences are given by:

$$u_t^i = u^i(c_t, l_t) + \beta u^i(d_{t+1}, h_{t+1}, z_{t+1}) \quad (1)$$

where β is a factor of time preference. The social security system can be characterized by two features: whether it is pay-as-you-go (PAYG) or fully-funded (FF) and whether it is contributory or redistributive. If the overall pension benefit of individuals i is P^i which is the sum of yearly benefits received p^i and equal to $(1 - z^i)p^i$, in the case of a PAYG system, we have:

$$\tau E(w^i l_t^i (1 + n) + w^i h_t^i z_t^i) = EP_t^i \quad (2)$$

while with a FF system, we have:

$$\tau E(w^i l_t^i R + w^i h_{t+1}^i z_{t+1}^i t) = EP_{t+1}^i \quad (3)$$

where τ is the payroll-tax-rate. In order to identify the effect of the social security system on retirement decision, we introduce the concept of net social security wealth, namely the present value of benefits minus contributions, which is denoted as Θ_t . We are also interested in $\theta_{t+1} = -\partial\Theta_t/\partial z_{t+1}R$ which is the marginal effect of z_t on social security wealth. In the literature θ_t is called the implicit tax on continued activity. We introduce the pension system in the lifetime budget constraint of individuals:

$$\frac{c_t^i + d_{t+1}^i}{R} = w^i(1 - \tau) \left(l_t^i + \frac{h_{t+1}^i z_{t+1}^i}{R} \right) + \frac{P_{t+1}^i}{R} \quad (4)$$

or

$$\frac{c_t^i + d_{t+1}^i}{R} = w^i \left(l_t^i + \frac{h_{t+1}^i z_{t+1}^i}{R} \right) + \Theta_t^i \quad (5)$$

Substituting this constraint in the utility function above and maximizing with respect to z_{t+1}^i , we obtain:

$$u_{d_{t+1}}^i (h_{t+1}^i w^i - \theta_{t+1}^i) = -u_{z_{t+1}}^i \quad (6)$$

We see clearly that θ_{t+1}^i introduces a wedge between the marginal productivity and the marginal disutility of working one more year. Now the effect of the social security system depends on its second feature, that is whether it is contributory or redistributive. In a purely redistributive system, retirees receive a flat-rate pension financed by a payroll tax that is proportional to earned income. In a purely contributory system, retirees get a pension that is proportional to their own contributions. Also with an FF system, there is equality between the present values of benefits and contributions. With a PAYG system, there is a difference between the two that depends on the gap between the rate of return on the capital market (R) and the rate of return of contributions($1 + n$).

We will consider a mixed PAYG system, since most social security systems are not purely contributory or purely redistributive, where α is the contributory fraction and $(1 - \alpha)$ the redistributive fraction. If we also consider a uniform value for \bar{p} , we obtain:

$$\Theta_t^i = -\tau w^i l_t^i \left(1 - \frac{\alpha(1+n)}{R}\right) - \frac{(1-\alpha)E\tau w^i h_{t+1}^i z_{t+1}^i}{R} + \frac{(1-\alpha)(1-z_{t+1}^i)\bar{p}_{t+1}}{R} \quad (7)$$

And the implicit tax rate is given by:

$$\theta_{t+1}^i = (1-\alpha)(\tau w^i h_{t+1}^i + \bar{p}_{t+1}) \quad (8)$$

Thus it emerges that one more year of work not only implies an annual tax of $\tau w^i h_{t+1}^i$ but also the foregone benefit of \bar{p}_{t+1} . Within this framework, we can also assess the alternative systems. It is straightforward that a purely contributory FF system as well as a purely contributory PAYG system are neutral both on average and at the margin when the rate of return of the two are equal ($\Theta^i = 0$ and $\theta^i = 0$). However with a contributory PAYG system when $R > 1 + n$, this generates a negative social security wealth. In this case, The system induces a negative income effect and should increase the age of retirement (given that retirement is a normal good). By contrast if $\alpha = 0$, an FF system as well as a PAYG system, when the rate of return of the two are equal, will distort retirement choice. Marginally, the two systems are not actuarially fair. Individuals earning less than average will have positive social security wealth and those with earned income above the mean income will have negative social security wealth.

2.2 Evidence on the impact of social security

Empirically, the impact of these benefits has been intensively studied in recent years. Studies by the Organization of Economic Cooperation and Development

(OECD) and National Bureau of Economic Research (NBER) have uncovered sizable effects of disability and pension programs as well as special unemployment benefits for older workers on the activity rates of people past the age of 50 or 55.

The studies by Blondal and Scarpetta (1999), Gruber and Wise (1999) and Duval (2003) have compared social security systems and retirement incentives in several countries. Using cross-country data, they were able to uncover a long-run effect that it is impossible to see in microeconomic studies of people who retire within a few years of one another. In particular, social security may influence the trend in average workers' preferences regarding the desirability of working in old age. These studies have pointed out the role of social security wealth as a measure of retirement incentives¹.

Such cross-national studies have attempted to find a correlation between a worker's choice to retire and incentives that might motivate a worker to retire at one age rather than another. If the average worker's choice of age of retirement has been gradually changed as a result of social security incentives, cross-national studies are better suited to detect the possible effects because they display the long-term impact of stable differences in the retirement systems of different countries. In addition, these studies examined not only public pension incentives but all the exit schemes existing in each country. Their findings imply that the trend in labor force participation at older ages may have been decisively influenced by incentives in national social security systems.

However, the literature has been concerned with possible incentive effects of social security schemes at an even earlier stage. We can distinguish three broad approaches that have been used to estimate the effects of social security on retirement. One category of studies relies on time series changes in public pension incentives to identify the impact of these incentives on some measures of aggregate

¹Let us recall that the social security wealth is the present discounted value of the worker's entitlement to future benefits in a retirement regime.

labor supply. The second category of studies relies on the differences between workers at a particular point in time to disentangle the influence of detailed program incentives on individual workers. The third category is based on what is usually called "a natural experiment", that is an unexpected change in the environment, to assess the behavioral response to this change.

Aggregate time series evidence sometimes suggests a large effect of the programs. Blondal and Scarpetta (1999) show that labor force participation rates fell particularly rapidly during the 1970s when social security benefits were greatly liberalized². However, this time-series evidence does not show any causal effect. The participation rates might have been declining even before social security began to become so generous.

The second kind of analysis focuses on differences between individual workers to identify the effects of detailed social security incentives on labor supply. The advantage of this approach is that incentives can be measured much more accurately in micro-census datasets than in aggregate data. Furthermore it allows us to take into account other influences on labor supply, including health status, wealth accumulation and other personal characteristics. In the US, Boskin (1977), Boskin and Hurd (1978), Burtless and Moffitt (1985) found that even big changes in social security cause only modest changes in the labor supply. Gustman and Steinmeier (1986) and Anderson et al. (1999) used a life-cycle structural model of labor supply and also showed that social security incentives play a minor role. However, such studies were concerned only with the public retirement scheme and did not account for the other social security schemes that may induce withdrawal from the labor force. On this point, studies from the NBER by Gruber and Wise (2004) in twelve OECD countries are interesting since for each country, all the existing

²Their study considers 15 OECD countries: United States, Japan, Italy, United Kingdom, Canada; Australia, France, Ireland, Netherlands, Portugal, Spain; Germany, Finland, Norway and Sweden

social security pathways to early retirement are taken into account. They show a strong relationship between levels of social security incentives and retirement behavior in each country. Furthermore, they show that the effect is strikingly uniform in countries with very different cultural histories, labor market institutions, and other social characteristics. Studies by Blundell et al. (2002) for the UK and by Borsch-Supan (2000) for Germany are particularly important in this respect.

The third way to analyze the influence of a social security program is to examine behavioral differences between people who face different incentives because the system changed in an unanticipated way. The main example comes from the US, where two major events have been identified. First, from 1969 to 1972, social security benefits increased much faster relative to wages than at any time in the past. The result was that by 1973 benefits were 20 percent higher than would have been the case if they had grown as they did during the 50s and 60s. Second, in 1977, the US congress passed amendments to the social security act that sharply reduced benefits to workers born in 1917 and after in comparison with workers born before that date. These two episodes were examined by Burtless (1986) and Krueger and Pischke (1992) respectively. Both studies reach an identical conclusion. Major changes in social security generosity have an impact on labor supply but a limited one. Their findings imply that most of the decline in the participation rates of older males between 1968 and 1985 was due to factors other than social security reforms.

Baker and Benjamin (1999) examined the introduction of early retirement provisions to Canada's two public pension plans. They also found a negative impact on labor supply but they insist on the fact that men who initially took advantage of the early retirement provisions would otherwise have had limited labor market participation.

In Switzerland, Hanel and Riphahn (2006) used reforms in the Swiss public

retirement system to identify the responsiveness of retirement timing to financial incentives. They rely on 1991 reforms only targeted at women, which increased the eligibility age from 62 to 64 and allowed early retirement before that retirement age through benefit reductions. Their findings show that a permanent reduction of retirement benefits by 3.4 percent induced more than 71 percent of females to postpone their retirement. In Italy, Mastrobuoni (2006) examined a change in the normal retirement age. The reform under study stated that, for cohorts born in 1938 and after, the normal retirement age was to be increased by two months per year. Mastrobuoni's findings show that the reform positively affected the effective age of retirement for the considered cohorts. Euwals et al. (2006) also show for the Netherlands how a change in the social security system affected early retirement behavior. In the early 1990s, the Dutch PAYG early retirement schemes were transformed into less generous and more actuarially fair capital funded schemes. However, the starting dates of the transitional arrangements varied by industry. The authors exploit the variation in starting dates to estimate the causal impact of the policy reform on early retirement behavior. They conclude that the policy reform induced workers to postpone retirement and they thus confirm the effect of the system on labor force participation.

Finally, in the last decade, the literature has paid particular attention to the retirement of couples. Spillover effects of retirement incentives from social security onto the retirement behavior of a worker's spouse may exist, due to effects of income and the complementarity of leisure between spouses (Coile, 2003). Hurd (1996) and Blau and Shvydko (2007) show that one-third of couples in which both spouses are in the labor force at age 50 retire within one year of each other. But the effects of a spouse's retirement status on the labor force participation of a worker are mixed. Pozzebon and Mitchell (1989) find no significant effect of a retired husband on the wife's participation decision. However, Gustman and

Steinmeier (1994, 2002) find significant joint retirement. They show that each spouse's decision has a strong influence on the other. In Canada Baker (1999) also highlights the family dimension of the decision. He pointed out that the introduction of a spouse's allowance would have an effect of the participation rate of both men and women. Finally, Coile (2003) finds that a woman's retirement incentives have spillover effects on her husband's retirement decision but that the reverse is not true.

3 Social security and the demand for older workers

The consideration of social security incentives toward early labor market exit is not sufficient to explain the low labor participation of older workers. Social security early retirement schemes can also act on the labor demand of workers. Indeed early retirement may also play a specific role in the global adjustment of the workforce within the firm. Yet it is known that employers have been very active in retiring their labor force early, particularly when the gap between earnings and productivity increases with age, due to seniority wages. If a demand or a technological shock, for example, takes place, the older workers, because of their higher cost to the firm, represent a burden. The employers then have an incentive to separate from these workers through early retirement schemes.

This argument was first proposed by Lazear (1979). The key prediction of his model is that wages rise more rapidly than marginal product and as a result, contracts between employers and employees need to define a mandatory retirement date. When productivity is barely observable, firms and workers may engage in an implicit contract wherein the wage may be greater than the productivity at the end of the career in order to discourage misbehavior. Lazear shows how a mandatory retirement date is part of an optimal labor market contract that minimizes the

incidence of cheating. Since compensation is shifted to the end of the contract, this suggests a termination date in the optimal arrangement between a firm and its workers (Stern and Todd, 2000). Lazear (1979, 1981, 1999) also shows that early retirement through the firm's pension plans, which are not actuarially fair, may be part of this optimal contract. The pension benefits play the role of severance pay and actually allow the restoring of flexibility without breaking the implicit contract.

In the case of social security benefits, the story is somewhat different. The benefits are not part of a labor contract but are under government initiative and highly subsidized. However, when demand is weak and layoffs are necessary, social security benefits can act as a form of unemployment insurance, subsidizing workforce reductions by lowering the cost of shedding older workers (Hutchens, 1999). Furthermore, since social security benefits are not actuarially fair and not subject to experience rating, the result is an inefficiently high level of early retirements.

3.1 Long term implicit contracts

In order to discourage misbehavior, employers and employees enter into implicit contracts where workers are paid a wage less than their marginal product during the initial years and greater than their marginal product at the end. In doing this, the workers post a bond with the employer at the beginning and this bond is repaid at the end. The idea is that at the end of the contract, workers have received exactly the discounted value of their marginal product until a date of termination. Let MP be the marginal product of work and W_R the reservation wage (let us say the value of leisure) increasing with age. If the worker is paid the value of the marginal product, it is efficient to go onto retirement at date R^* , when $MP = W_R$ (see Figure 1). But in order to discourage the worker from misbehaving, the firm offers a delayed compensation contract, which offers a wage W^* . Now the worker

has no incentive to quit at date R^* since $W^* > W_R$. This delayed compensation contract therefore has implications for the employer's retirement policy because a definite date of termination has to be fixed. The employer will not want the relationship to continue beyond time R^* in Figure 1 because at this point the loan has been repaid. There would be a loss from employing the worker for longer but the worker will not wish to quit since at this point the wage W^* is higher than the reservation wage W_R . Thus there must be a date for terminating the contract, at which point the worker is no longer able to receive a wage greater than MP .

However, the fact that at the end of her career, the worker is paid above her productivity makes her more vulnerable to shocks. In Lazear's study, the mechanism provides justifications for firm pension plans that allow separation from older workers. But while a pension plan entirely embodied in the contract allows an efficient reallocation of the workforce, by subsidizing workforce reduction, public early retirement schemes can act as a form of unemployment insurance. Moreover, since those benefits are not experience-rated, this may result in an inefficiently high level of early retirements.

It is efficient for the worker to quit if $W_R > MP$. To induce separation, the firm has to compensate the worker for the bond posted when young. But the firm can also use publicly provided early retirement benefits. This is the case in most countries where there are no generalized firm pension plans. Yet the benefits may be exempted or not from actuarial adjustment and may be experience-rated or not. This is crucial for the way firms will behave. Let G be the social security benefits. If there is actuarial adjustment, the benefits are of the form $G_t = G_{t+1} - \Psi$, where Ψ is a parameter. If Ψ is set at zero, then the system has no actuarial adjustment. If Ψ is set so that the system is actuarially fair, then the present value of expected social security benefits is invariant to the age of retirement. Thus, if the system is fair, $G_t + sG_t = s(G_t + \Psi)$ where s is the probability of surviving until the next

period. This implies that $\Psi = G/s$. In addition, consider that the early retirement benefits are experience-rated by a parameter e . That is the firm pays a tax of eG whenever workers take early retirement, where e lies between 0 and 1. If $e = 1$, then the firm bears the full cost of benefits.

Considering this, Hutchens (1999) shows that the rule for determining early retirement is $W_R + (1 - e)G - \Psi s > MP$. We see in Figure 2 that if there is no actuarial adjustment ($\Psi = 0$) and experience rating is complete ($e = 1$) or if there is no experience rating ($e = 0$) and the system is fair ($\Psi = G/s$), we obtain the same rule as before. But in the case of $0 < \Psi \neq G/s$ and/or $0 < e < 1$, this implies a higher level of early retirement.

This framework depicts a world where employers are actively involved in the retirement decision, in conjunction with government action through its provision of early retirement benefits. Consequently, employers may force more workers to leave because they are not fully involved in the financing and the design of the system.

3.2 Empirical evidence

Several empirical studies have shown that differences in wages according to age are not due to differences in marginal productivity (Medoff and Abraham, 1981; Lazear and Moore, 1984; Kotlikoff and Gokhale, 1992; Hellerstein et al., 1999; Crépon et al.; Flabbi and Ichino, 2001 and Dohmen, 2004). The methods used differ but overall there seems to be some evidence that the wage profile rises above the productivity profile at the end of a person's working life. This evidence provides the background for an explanation of why firms may have an incentive to induce older workers to retire early.

In the literature, we find evidence on how particular shocks may induce early retirement. The most obvious reason for terminating contracts is an unexpected

change in the value of the marginal product due to business-cycle conditions. The dismissal of older workers is a commonly used strategy to deal with firm restructuring measures. Technological shocks may also induce more early retirement. Bartel and Sicherman (1993) showed empirically that an unexpected change in the rate of technological change induces older workers to retire sooner. An unexpected technological change will produce an increase in the depreciation rate of the stock of human capital. In addition, since the costs of retraining are likely to be higher for older workers, higher depreciation rates will induce earlier retirement. Recently, Friedberg (2003), using US data from the Current Population Survey and the Health and Retirement Study, explored that new technologies, as computers, alter jobs and skill requirements in jobs. The results indicate that computer use led directly to later retirement but the estimates also show that older workers failed to keep pace with recent changes in computer use. Let us add that unexpected changes in the alternative use of time, as a change in the value of workers leisure due to poor health, can also have an impact on early retirement.

In most cases, early retirement can be a soft way to reduce or renew the workforce. Both employers and employees benefit from such an arrangement, but it leads to a high level of early retirement because of the generosity of the public early retirement schemes and the fact that these schemes are in general not experience-rated.

Using a Finnish pension reform as a natural experiment, Hakola and Uusitalo (2005) show that if the public early retirement scheme were experience-rated, their use by firms would be reduced. They consider retirement as a joint decision made by employees and employers. They use data from a pension reform in 2000 in Finland, which reduced the unemployment-related early retirement benefits and changed the experience-rating schedule. Both the decrease in benefits and the change in the degree of experience-rating differed across employees and employers.

Experience-rating increased considerably in the largest firms, while it increased to a lesser extent or even decreased in smaller firms. This allowed the authors to identify the effect of the reform by comparing the changes in the early exit rates in the different categories of firm. Their analysis shows that experience-rating matters. The reduction in the exit rates was greater in the firms that faced larger increases in the cost of early retirement. Their results support the claim that firms do influence early retirement decisions. In an earlier study, Osberg (1993) had already shown that the role of firms in inducing early retirement was not negligible. Using a sample of the Labor Market Activity Survey of Statistics in Canada, Osberg shows that labor market constraints have a significant impact. The labor demand is a determinant of the labor market behavior of older workers. More recently, Dorn and Sousa-Poza (2007), based on international microdata covering 19 industrialized countries, have also shown that generous early retirement provisions induce firms to push more employees into early retirement. Finally, Bellmann and Janik (2007), using a German establishment panel, analyzed early retirement as a consequence of firms' profit-maximizing behavior. They confirm the relationship postulated by Hutchens above. They find a negative significant effect of the rate of employment growth on the retirement decision, which confirms the influence of demand shocks.

4 Why does a government promote early retirement?

It is widely recognized that the effect of aging populations and increasing longevity poses a serious threat to the financial viability of social security schemes. But the increasing number of older persons leaving the labor force at an increasingly younger age has compounded these effects on the financial burden. This brings

into question the reasons why most countries introduce these schemes and are somehow reluctant to change them.

In grappling with the problems posed by high and persistent unemployment after the 1970s oil shocks, an array of labor market policies have been implemented. In particular, social security systems that encourage older persons to leave the labor force have often been claimed to free up jobs for young unemployed people. The argument behind this reasoning is based on the idea of worksharing, or what is called the assumption of a lump of labor. This is based on the simple notion that, in a given period, a fixed amount of labor input required to produce a fixed volume of goods and services can be shared between persons who are already employed and those who are unemployed. It is usually argued that a trade-off can be made between the positively valued leisure of the older employed and the unwanted leisure of the younger unemployed.

In many countries (especially continental European countries), where early retirement was widely proposed in the 1970s, the idea was that by sending older workers into early retirement, younger workers would benefit from more jobs. Here are a few examples. In the Netherlands, the first plan (1975) proposing early retirement was called "Jong voor oud" (Young for Old). In the UK, the Job Release Scheme, which was effective between 1977 and 1988, was an employment measure that allowed specific categories of full-time older workers to retire early, on the condition that their jobs were filled by job-seekers who were unemployed. In Belgium during the 1980s, an early retirement scheme allowed male workers to retire a maximum of 5 years early if the employer committed to replacing the worker with a young unemployed person. In France, the "contrats de solidarité" (Solidarity Contracts) introduced in 1982 had the same goal. In Spain, the 1985 pension system reform, which gave shape to the system currently in place, introduced several specific programs to favor the substitution of older by younger workers. In

Canada, the introduction of early retirement in the Canadian Pension Program in the 1980s was concerned with high unemployment and led to demands that older workers be forced out of the labor force to make room for younger workers. By contrast, there is little evidence of such a debate in the US.

Although today, most countries are on the road to changes and have scaled down early retirement programs to meet financial stability, the same reasoning is also often used to argue against efforts to reduce or eliminate the incentives for older persons to leave the labor force, claiming that the consequent increase in the employment of older person would reduce the employment of younger persons. A confirmation of this general agreement about early retirement as a means to reduce unemployment is given in 1, which shows the distribution of answers to a question in the Eurobarometer 2001. The question was: "Do you agree that people in their late 50s should give up work to make way for younger people?". Table 1 shows that in most European countries, people strongly believe that early retirement is a good way of reducing youth unemployment. Except in the case of Denmark, Finland, Ireland, the Netherlands and the UK, more than 50% of people agree with the proposition. This is not very surprising since the countries wherein people most agree are those with the highest unemployment rates.

However, the extent to which early retirement schemes have alleviated unemployment remains controversial. Most economists would today dismiss the idea immediately. Such an unemployment-reduction mechanism suggests a perfect homogeneity of workers, younger and older, while we know that differences exist between workers by age, and not only in terms of general human capital. But more simply, the argument forgets that labor demand is not independent of economic conditions. Layard et al. (2005) provide a simple reasoning as to what we might expect from early retirement. If output is unaffected, it will be produced by those who most want to work. But output is not given and it will probably

respond to increased early retirement. If the number of jobs remains unchanged, when workers retire, unemployment falls. Therefore, the low level of unemployment will cause inflationary pressure and the government, which has chosen a mix of inflation and unemployment, and will let unemployment rise to its former level. The consequence is that there are now fewer jobs and the output is reduced. This is what Layard et al. call the lump-of-output fallacy. They provide a simple graphical illustration, which shows that, while early retirement has increased, the unemployment rate has increased too, and this contradicts the argument of a likely substitution between workers of different ages.

Boldrin et al. (1999) have questioned the same argument of early retirement acting as a youth unemployment reduction mechanism. They collected labor market data for 260 NUTS II and NUTS III European regions in 1986, 1991 and 1996. They plot the relationship between the exit rates from the labor force of older people and changes in youth unemployment rates. Their estimates find no significant relationship either for men or for women. According to their study, early retirement of older workers does not induce lower youth unemployment. We renew their studies here with more recent data and, as Figure 3 and 4 show, there is no significant relationship either for men or for women between the exit rates from the labor force of older people and changes in youth unemployment rates.

These results do not take into account the general equilibrium effects. In a specific study of the Belgian labor market, Sneesens et al. (2002) used a calibrated general equilibrium unemployment model for Belgium. They are interested in the early retirement of less skilled workers. Their results show that the immediate effect of early retirement is a decrease in the unemployment rate of low skilled workers but that this then makes the cost of labor increase through a rise in wages, which in turn reduces equilibrium employment. Considering low and highly skilled workers, the authors show that, if the unemployment rate of low skilled

workers decreases first, the unemployment rate of highly skilled workers increases to a greater extent, relatively speaking, and this makes for an increase in total unemployment.

In a recent book by Gruber and Wise (2009), the claim that a decrease in the employment rate of older workers would reduce the unemployment of younger persons is empirically addressed for 12 countries³. They consider time series of employment, unemployment and participation rates and analyze the eventual relationship between social security incentives to retire and the labor outcomes. Their results provide no evidence that inducing older persons to leave the labor force frees up jobs for the young. If anything, the opposite is true; paying for older persons to leave the labor force reduces the employment rate and increases the unemployment rate of the young and of persons in their prime age working years.

Finally, this question remains in the literature on substitution between labor force aggregates. Yet Hammermesh and Grant (1979) present a critical synthesis of the large number of studies available at that time. Their conclusion is that young workers' own-wage elasticity of demand exceeds unity but that the degree to which they are substitutes for older workers is unclear. If the cost of employment of older workers increases, this induces employers to increase their demand for young worker and to substitute them for older workers. The point is that in addition to this possible substitution effect, there is also a scale effect. The higher cost of employment of older workers provides employers with an incentive to decrease employment of all inputs, including younger workers. Hebbink (1993) finds that the demand for young and older workers changes in the same direction if the level of one of their wages changes.

³The countries under study are Belgium, Canada, Denmark, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, UK and the US

5 Conclusion

This paper surveys a number of theoretical and empirical studies in order to derive some explanations for the massive early retirement phenomena induced by social security systems. For this purpose we conducted an upward analysis. Starting from the base, we showed how workers facing regimes offering non actuarial generous benefits have incentives to stop working before the normal retirement age.

We then looked at the demand side of the labor market. In particular, we showed that firms, through their wage-setting practices, suffer when a shock occurs. Because older workers are costlier for the firms than younger workers, the firms have an incentive to separate from those older workers first when the need to reduce the workforce arises. We showed that major public financing of non actuarial early retirement benefits has given rise to practices by firms wherein early retirement is a fully-fledged tool for workforce management.

Finally, we reached the top of the pyramid, namely the motivations that drive governments to put in place early retirement schemes. We showed evidence that governments have long used early retirement as a labor force policy instrument. The strong belief that the early exit of older workers reduces youth unemployment has, however, never been confirmed and we presented evidence that this assertion is doubtful.

At the time of great concern about the sustainability of social security systems, the process highlighted in this paper is of great importance. Increasing labor force participation is not simply a matter of labor supply. Firms and governments also need to change their practices if the goal is to reach a high level of activity among older workers.

References

- ANDERSON, P., A. GUSTMAN, AND L. STEINMEIER (1993): "The Role of Pensions in the Labor Market," NBER Working Paper, No. 4295.
- ANDERSON, P., A. GUSTMAN, AND L. STEINMEIER (1999): "Trends in Male Labor Force Participation and Retirement: Some Evidence on the Role of Pensions and Social Security in the 1970s and 1980s," *Journal of Labor Economics*, 17, 757–783.
- BAKER, M. (1999): "The Retirement Behavior of Married Couples: Evidence from the Spouse's Allowance," NBER Working Paper, No. 7138.
- BAKER, M., AND D. BENJAMIN (1999): "Early retirement Provisions and the Labor Force Behavior of Older Men: Evidence from Canada," *Journal of Labor Economics*, 17(4), 724–756.
- BARTEL, A., AND N. SICHERMAN (1993): "Technological Change and Retirement Decisions of Older Workers," *Journal of Labor Economics*, 11(1), 162–183.
- BELLMANN, L., AND F. JANIK (2007): "Firms and Early Retirement: Offers that One does not Refuse," IZA Working Paper, No. 2931.
- BLAU, D., AND T. SHVYDKO (2007): "Labor Market Rigidities and the Employment Behavior of Older Workers," IZA Working Paper, No. 2996.
- BLONDAL, S., AND S. SCARPETTA (1999): "The Retirement Decision in OECD Countries," OECD Working Paper, No. 202.
- BLUNDELL, R., C. MEGHIR, AND S. SMITH (2002): "Pension Incentives and the Patterns of Early Retirement," *Economic Journal*, (112), 153–170.
- BOLDRIN, M., J. DOLADO, J. JIMENO, AND F. PERACCHI (1999): "The Future of Pension in Europe," *Economic Policy*, 29, 289–322.
- BORSCH-SUPAN, A. (2000): "Incentive Effect of Social Security on Labour Force Participation: Evidence from Germany and Across Europe," *Journal of Public Economics*, 78, 25–49.
- BOSKIN, M. (1977): "Social Security and Retirement decision," *Economic Inquiry*, 15(1), 1–25.
- BOSKIN, M., AND M. HURD (1978): "The Effect of Social Security on Early Retirement," *Journal of Public Economics*, 10, 361–377.
- BURTLESS, G. (1986): "Social Security, Unanticipated Benefits Increases, and the Timing of Retirement," *Review of Economic Studies*, 53(5), 781–805.

- (2004): “Pension Reform and Labor Force Exit: Cross-National Evidence,” *Sixth International Forum of the Collaboration Projects on Population Aging, Economic and Social Research Institute*, (February 2004).
- BURTLESS, G., AND R. MOFFITT (1985): “The Joint Choice of Retirement Age and Post-retirement Hours of Work,” *Journal of Labor Economics*, (3), 209–236.
- COILE, C. (2003): “Retirement Incentives and Couples’ retirement decisions,” NBER Working Paper, No. 9496.
- CRÉPON, B., N. DENIAU, AND S. PEREZ-DUARTE (2002): “Wages, Productivity and Worker Characteristics: a French Perspective,” *CREST Working Paper*, CREST.
- DOHMEN, T. (2004): “Performance, Seniority, and Wages: Formal Salary Systems and Individual Earnings Profiles,” *Labour Economics*, 11, 741–763.
- DORN, D., AND A. SOUSA-POZA (2007): “Voluntary and Involuntary Early Retirement: an International Analysis,” IZA Working Paper, No. 2714.
- DUVAL, R. (2003): “The Retirement Effects of Old-Age Pension and Early Retirement Schemes in OECD Countries,” OECD Working Paper, No. 370.
- EUWALS, R., D. VAN VUUREN, AND R. WOLTHOFF (2006): “Early Retirement in the Netherlands: Evidence from a Policy Reform,” IZA Working Paper, No. 1992.
- FENGE, R., AND P. PESTIEAU (2005): *Social Security and Early Retirement*, CESifo book series. Massachusetts Institute of Technology Press, Cambridge.
- FLABBI, L., AND A. ICHINO (2001): “Productivity, Seniority and Wages: New Evidence from Personnel Data,” *Labour Economics*, 8, 359–387.
- FRIEDBERG, L. (2003): “The Impact of Technological Change on Older Workers: Evidence from Data on Computer Use,” *Industrial and Labor Relations Review*, 56(3), 511–529.
- GRUBER, J., AND D. WISE (1999): *Social Security and Retirement Around the World*, NBER Volume. University of Chicago Press, Chicago.
- (2004): *Social Security and Retirement Around the World: Micro-estimation*, NBER Volume. University of Chicago Press, Chicago.
- (2009): *Social Security and Retirement Around the World: The Relationship to Youth Employment*, NBER Volume. University of Chicago Press, Chicago.
- GUSTMAN, A., AND L. STEINMEIER (1986): “A Structural Retirement Model,” *Econometrica*, 54, 555–584.

- (1994): “Retirement in a Family Context: A Structural Model for Husbands and Wives,” NBER Working Paper, No. 4629.
- (2002): “Social Security, Pensions and Retirement Behavior Within the Family,” NBER Working Paper, No. 8772.
- HAKOLA, T., AND R. UUSITALO (2005): “Not so Voluntary Retirement? Evidence from a Pension Reform,” *Forthcoming in Journal of Public Economics*.
- HAMMERMESH, D., AND J. GRANT (1979): “Econometric Studies of Labor-Labor Substitution and their Implications for Policy,” *Journal of Human Resources*, 14, 518–542.
- HANEL, B., AND R. RIPHAHN (2006): “Financial Incentives and the Timing of Retirement: Evidence from Switzerland,” IZA Working Paper, No. 2492.
- HEBBINK, G. (1993): “Production Factors Substitution and Employment by Age group,” *Economic Modelling*, 10, 217–224.
- HELLERSTEIN, J., D. NEUMARK, AND K. TROSKE (1999): “Wages, Productivity, and Worker Characteristics: Evidence from Plant-Level Production Functions and Wage Equations,” *Journal of Labor Economics*, 17(3), 409–446.
- HURD, M. (1996): “The Effect of Labor Market Rigidities on the Labor Force Behavior of Older Workers,” in *Advances in the Economics of Aging*, ed. by D. Wise, pp. 11–60. The University of Chicago Press, Chicago.
- HUTCHENS, R. (1999): “Social Security Benefits and Employer Behavior: Evaluating Social Security Early Retirement Benefits as a Form of Unemployment Insurance,” *International Economic Review*, 40, 659–678.
- KOTLIKOFF, L., AND J. GOKHALE (1992): “Estimating a Firm’s Age-Productivity Profile Using the Present Value of Worker’s Earnings,” *Quarterly Journal of Economics*, 107, 1215–1242.
- KRUEGER, A., AND J. PISCHKE (1992): “The Effect of Social Security on Labor Supply: A Cohort Analysis of the Notch Generation,” *Journal of Labor Economics*, 10(4), 412–437.
- LAYARD, R., S. NICKELL, AND R. JACKMAN (2005): *Unemployment. Macroeconomic Performance and the Labour Market*. Oxford University Press, second edn.
- LAZEAR, E. (1979): “Why is there Mandatory Retirement?,” *Journal of Political Economy*, 87(6), 1261–1284.
- (1981): “Agency, Earnings Profiles, Productivity, and Hours Restrictions,” *American Economic Review*, 71(4), 606–620.

- (1999): “Retirement from the Labor Force,” in *Handbook of Labor Economics*, Vol. 3A, ed. by O. Ashenfelter, and D. Card, pp. 305–355. Elsevier, Amsterdam, North Holland.
- LAZEAR, E., AND R. MOORE (1984): “Incentives Productivity and Labor Contracts,” *Quarterly Journal of Economics*, 99, 275–296.
- MASTROBUONI, G. (2006): “Labor Supply Effects of The Recent Social Security Cuts: Empirical Estimates Using Cohorts Discontinuities,” CeRP Working Paper, No. 53.
- MEDOFF, J., AND K. ABRAHAM (1981): “Are Those Paid More Really More Productive? The Case of Experience,” *Journal of Human Resources*, 16(2), 186–216.
- OSBERG, L. (1993): “Is Retirement or Unemployment? Induced ‘Retirement’ and Constrained Labour Supply among Older Workers,” *Applied Economics*, (25), 505–519.
- POZZEBON, S., AND O. MITCHELL (1989): “Married Women’s Retirement Behavior,” *Journal of Population Economics*, (2(1)), 39–53.
- SNEESENS, H., F. SHADMAN, AND O. PIERRARD (2002): “Effets des Préretraites sur l’Emploi,” *15ème Congrès des Economistes belges de Langue française*, Commission 4, CIFOP, Charleroi, 167–183.
- STERN, S., AND P. TODD (2000): “A test of Lazear’s mandatory retirement model,” *Research in Labor Economics*, pp. 253–273.

Figure 1: Lazear's model

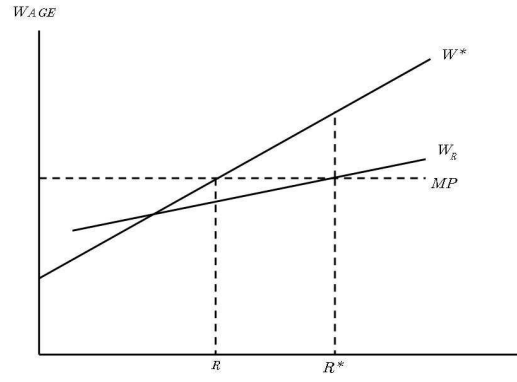


Figure 2: Actuarial fairness and experience-rating

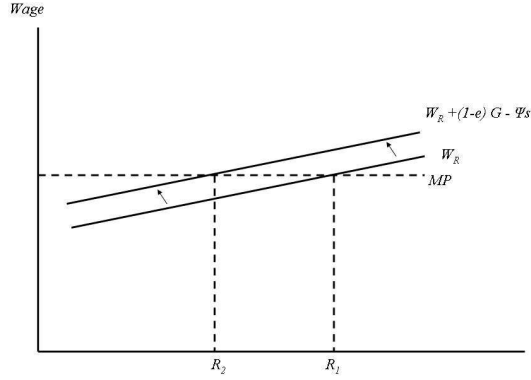


Table 1: People in their late 50s should give up work to make way for younger people, 2001

Country	Strongly agree	slightly agree	Slightly disagree	Strongly disagree
Austria	11.9	25.3	30.3	25.3
Belgium	32.0	34.2	17.7	6.5
Denmark	9.5	13.8	21.3	54.3
Finland	14.0	25.6	28.4	28.7
France	38.9	29.7	18.0	8.8
Germany	21.5	30.5	28.9	12.5
Greece	75.8	15.3	4.4	2.7
Ireland	10.4	18.1	22.4	39.6
Italy	34.2	38.5	16.6	5.2
Luxembourg	46.5	25.7	15.6	9.7
Netherlands	9.9	21.8	20.4	42.8
Portugal	27.2	50.6	15.6	1.5
Spain	32.8	40.1	14.8	5.3
Sweden	20.8	29.9	13.2	33.5
United Kingdom	5.3	15.8	21.5	49.4

Source: Eurobarometer 2001

Figure 3: Exit rates of women born 1938-1947 and changes in unemployment rates of women aged under 25 1999-2003

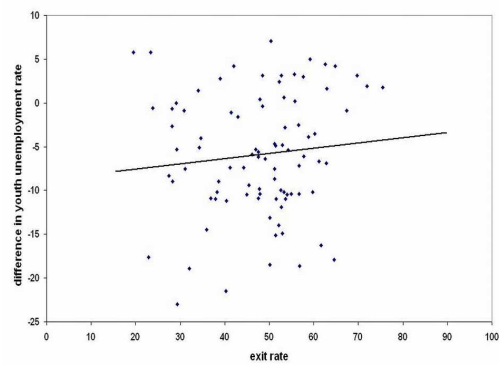
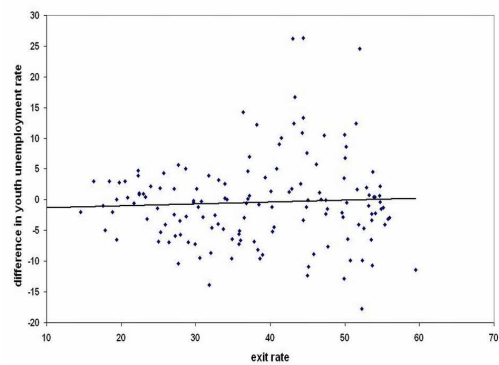


Figure 4: Exit rates of men born 1938-1947 and changes in unemployment rates of men aged under 25 1999-2003



Source: Own calculations based on Eurostat labor market indicators.