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The sooner, the better?
Analyzing preferences for early retirement in European countries*

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Abstract

Individual preferences concerning retirement age are strongly differentiated both within and between countries. According to the *Share* survey, the proportion of workers aged from 50 to 65 who wished to retire as soon as possible in 2004 ranged from 31% in the Netherlands to 67% in Spain. Such a preference for early retirement can depend on both financial and non financial factors. Non financial factors include working conditions, health status and mortality expectations. Economic or "monetary" factors essentially correspond to the magnitude of pension entitlements and how they depend upon retirement age. Entitlements that depend positively on retirement age should reduce the motivation to retire as soon as possible.

This paper compares the role of these different factors by combining individual data from the *Share* survey with macroeconomic indicators of pension entitlements recently produced by the OECD. Health and work conditions come out as strong determinants of the preference for early retirement. Being generally satisfied with one's work leads to a drop of approximately 16 percentage points in the probability of wishing to retire as soon as possible. Declaring oneself in bad or very bad health has a positive effect on this probability of a comparable order of magnitude. However, these non financial factors do not significantly contribute to the explanation of cross-country differentials. Conversely, financial factors seem to have a lower impact at micro-level, but a higher one for the explanation of cross-country differentials.

Subject Classification(s) J28, I10, J26
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Several European countries, such as France, Italy and Germany, are characterized by a particularly low average age at retirement, combined with a high rate of early exits through preretirement schemes. A dominant strand in the literature links such behavior to the incentive characteristics of retirement and preretirement schemes, i.e. it focuses on so-called financial determinants of retirement behavior. For instance, the recent French pension reform in 2003 placed fairly strong emphasis on the correction of these incentives. Models for analyzing or predicting the impact of such reforms currently describe the choice of retirement age in terms of an income/leisure trade-off where financial considerations play a major role (see Gruber and Wise, 2004, Mahieu and Blanchet, 2004).

However, this approach to retirement behavior is challenged on at least two grounds. The first one consists in emphasizing the role played by labor demand: retirement is not only a supply-side decision. It is also dependent on the willingness of employers to retain or hire workers approaching normal retirement age. The second one consists in arguing that, even from a purely supply-side perspective, monetary and financial considerations are not the sole determinants of behavior. Behavior can also be affected by parameters such as health status, working conditions and many other socio-demographic parameters. By expressing this in terms of the standard income/leisure trade-off, it is possible to present all these determinants as factors that potentially affect individual preferences for leisure or for non-market activities. The limit of monetary approaches is that they take preferences as given and ignore the richness and potential explanatory power of these various factors.

The purpose of this paper is to confront these different financial and non-financial explanations of retirement behavior. More precisely, our analysis will consider the determinants of aspirations to an early exit from the labor force. This choice of modeling aspirations rather than realizations is justified below by mixing two sources of data. The first and major source is the first wave of the Share survey data collected in 11 European countries in 2004. This survey provides us with our dependent variable (the fact of wishing to retire “as soon as possible”) and a large number of non-financial determinants measured at individual level, including measurements of satisfaction at work and health conditions. The impact of these variables on preference for early retirement has already been explored with the same dataset as that used by Blanchet and Debrand (2005) and by Siegrist *et al.* (2007). The second source of data is a series of indexes that measure the incentive properties of pension rules in OECD countries recently compiled by Queisser and Whitehouse (2007).

The paper is structured as follows. After a review of the economic literature (section 1), we describe the dataset derived from the Share survey (section 2). This descriptive analysis shows that a relatively strong dispersion of the wish to retire “as soon as possible” exists not only within a country but also between countries. The general purpose of the paper will be to examine how financial and non-financial factors contribute to the explanation of individual and international differences. Firstly, we propose a model centered on non-financial factors (section 3). Two versions of this model will be proposed: with and without control of the selection bias, i.e. the fact that, by construction, the question concerning the wish to retire as soon as possible was only asked to working individuals. We see that health status and working conditions currently represent strong determinants of preferences at individual level, but their explanatory power is much less significant at cross-national level. This provides a strong motive for reintroducing financial factors in the model, since previous studies based

on macro observations have suggested that these financial considerations are well correlated to international differences in employment rates. This point is dealt with in section 4. We first present the incentive measures used. Unfortunately, these measures are not micro-measures but since OECD data are provided within each country for several typical employee profiles, they nevertheless contain a certain amount of infra-national variation.

1. Modeling senior employment and aspirations to retire: a general outline.

Employment or labor force participation of older workers depends on a great many variables (see fig. 1). This is true for these workers' aspirations in terms of retirement age, which is the variable of interest in this study, and it is also true for their current employment status, which we must also model to control for selection biases. The outline below endeavors to summarize the main relationships at stake.

<< Fig 1 >>

1.1 Financial determinants

Much literature has been devoted to financial determinants (see fig 1; relationship 1), i.e. the role of benefit levels and profiles by age (Gruber and Wise, 1999; Blöndal and Scarpetta, 1998; Duval, 2003). The models used by this literature can be presented as models of arbitrage between pension levels and length of retirement. They show that benefits have an influence on labor supply in at least two ways. A high replacement rate is obviously an incentive to leave earlier, but the progressivity of benefits according to retirement age is also an incentive to retire earlier or later. At a given replacement rate, a system in which entitlements strongly increase with retirement age encourages the postponement of retirement. On the contrary, a system where entitlements cease to increase beyond a certain age is scarcely an incentive to continue working beyond this age.

Another category of economic determinants is that of the constraints that exist with regard to labor demand (relationship 2). Detailing the reasons why employers are reluctant to keep or hire older workers falls outside the scope of the present paper. Rather, we focus on "non economic" factors that play a role on the supply side. Classical models do not detail the real role of these different non-financial factors that can interfere with financial arbitrage on retirement age. All these factors are summarized within the parameter "preference for leisure". The higher this parameter is, the more inclined the individual will be to retire early, even with a lower replacement rate, and the less sensitive he will be to the progressivity of benefits with age. The study of non-financial determinants consists precisely in trying to achieve better understanding of the determinants of this preference parameter.

1.2 Non-financial determinants

A certain number of socio-demographic parameters must first be taken into account among the non-financial determinants. Level of education and type of employment generally have an effect on the

interest of the job in question and may influence preferences. The latter may also depend on family situation (relationship 3). In particular, one question is to know whether there is any coordination of spouses' retirement dates. Classical economic models assume that spouses make their decision to retire independently (Hurd, 1990). The unit of reference is thus not the couple but the individual. However, we must not forget that the decision to stop working is rarely an individual one. It is likely that the preference for "leisure" will be higher if one of the spouses is already out of work (this involves the hypothesis of complementary preferences for "leisure"). It would therefore be logical – if the household's means so allow – that the spouses seek to stop working at about the same date.

In addition to socio-economic factors, health status and working conditions are expected to play a significant role in the decision to retire early (relationships 4 and 5), especially since the two determinants are very closely related to one another (relationship 6) (Currie and Madrian, 1999; Dwyer and Mitchell, 1999; KerKhofs *et a,.* 1999; Kreider, 1999; Bound, 1991; Bound *et al*., 1999; Campioleti, 2002). Poor working conditions or job dissatisfaction can affect one's health status. Symmetrically, being in poor health makes given working conditions more demanding. This relationship between working conditions and health status is in fact a transversal theme of interest to many social science disciplines: economics, epidemiology, sociology or psychology. Studying this issue thus requires a global and multi-disciplinary vision. Three aspects of working conditions should be particularly borne in mind: the environment in which individuals work, the nature of the work and its organization. Karasek and Theorell (1990) show, for instance, that work organization may be a source of health risks. A distinction is made between physical stress and mental or psychological stress. Physical stress refers to the negative effects of working conditions on one's health status, whereas mental stress is characterized by the negative effects of work on the "psychological" health of workers. This type of stress is more difficult to prove. It often corresponds to each employee's individual apprehension regarding his job and working conditions. Karasek and Theorell (1990) and Siegrist (1996) have developed theoretical models that demonstrate the impact of notions of demand / control and the imbalance between demand and reward on health status. We group these concepts together under the term "job satisfaction". Ostry *et al* (2003) show that the combination of these two approaches improves understanding of the links between working conditions and health status. The job satisfaction analysis grid used in the SHARE survey, used herein, is largely inspired by Siegrist's model.

The interdependence between working conditions and health additionally leads to an interaction between health and employment status (Strauss and Thomas, 1998). Poor health status can lead to leaving employment earlier, but staying at work may also be detrimental to one's health status if it is combined with difficult working conditions. This circularity may complicate the causal interpretation of an apparent link between health and employment status. Another interaction effect is highlighted by Anderson and Burkhauser (1985): measuring the effect of health on labor supply may be biased if one considers, in line with Becker and Grossman, that one's health status itself is in part the result of individual choices (relationship 7): individuals may devote a varying amount of time and resources to remaining in good health and this choice can itself be affected by means or employment status. Moreover, the same authors raise the general problem of *measuring* health status. Most studies use

subjective statements by individuals as an objective indicator of health. In fact it is scarcely possible to obtain a variable that measures “true health” in a survey. Yet self-reported health status is subject to significant biases whose sources are diverse: education, social position, gender and social and family environment. It is therefore necessary to take into account this declaratory bias prior to (or simultaneously with) any examination of the impact of health on labor supply.

To conclude, another variable linked to health, namely anticipated life expectancy has an effect (of its own) on the decision to retire (relationship 8). Hurd and McGrady (1995) show, from the HRS survey (Health Retirement Survey – a survey similar to SHARE concerning individuals aged 50 and over in the United States) that the respondents have quite a good idea of the probability of their surviving to the age of 75. These results confirm those of Hamermesh (1985). In addition, individuals adjust their subjective probability according to their at-risk behavior (obesity, alcohol, smoking) and their state of health and socio-economic status. Hurd, McFadden and Merrill (1999) show for a sample group that this probability of survival is linked to state of health but also to predicted mortality. McGrady (2003) demonstrates that not only is this subjective probability of survival correlated with the fact of being in employment, but that it is also linked with the probability of working full time. It therefore seems that individuals have a relatively precise idea of their individual life expectancy and adjust their desire to leave by consequence (Hurd, Smith and Zissimopoulos, 2004).

1.3 What level of complexity should be chosen?

The large set of determinants shows that exhaustive modeling of the employment behavior of the older population is *a priori* rather complex. Should all of the determinants be systematically taken into account? This depends on the context.

As has been mentioned above, purely economic models do not ignore the fact that decisions are not only financially motivated and assume that other parameters come into play. The only limit to these economic models is that they do not explicitly state how each non-financial determinant contributes towards explaining the preference for leisure. Nonetheless, simplification of this nature remains perfectly acceptable for certain purposes. For example, if the aim is to anticipate behavior after the implementation of a purely financial reform, there is little to be gained in explicitly detailing the role of other parameters if one is unable to predict how each of them will evolve.

On the other hand, explicitly stating these parameters becomes essential if one wishes to quantify their impact on differences in behavior across countries, which is the case here. An exploration of this kind has some link with the debate on the relative weight of economic constraints and preferences in explaining differentials in employment levels from one country to another (Prescott, 2004). What is more, it makes it possible to raise the level of the debate by examining the objective factors that may underlie these differences in preferences. Quantifying the actual impact of health and working conditions on behavior is also necessary as soon as one plans to take action on retirement age through these two variables. Achieving this quantification obviously supposes controlling for other explanatory factors: this is what we attempt to achieve here, within the limits allowed by the survey data.

2. Data description

2.1. The main data source: the SHARE survey

SHARE (*Survey on Heath, Ageing and Retirement in Europe*) is a longitudinal survey carried out among Europeans aged 50 and over. The aim of SHARE is to better analyze the economic and social problems linked to ageing and to allow making international comparisons. SHARE has been inspired by similar experiments in the United States and in the UK: the Health and Retirement Survey (HRS) in the United States, which is in its sixth wave, and the British panel, ELSA (English Longitudinal Survey of Ageing). The topics considered within the context of this survey are of particular interest to the following disciplines: health, psychology, economics and sociology. The data collected include health variables (self-reported health status, physical and cognitive tests, behavior with regard to health and use of the healthcare system), psychological variables (mental health, well-being, satisfaction), socio-economic variables (professional status, characteristics of professional activity, retirement age, financial resources, level of income, housing, education) and social support variables (family support, financial transfers, social networks, voluntary work, etc.).

The first wave collected in 2004 concerned 11 European countries (Germany, Austria, Belgium, Denmark, Spain, Greece, Italy, the Netherlands, Sweden, Switzerland and France) in which 20,000 households were questioned, namely 40,000 individuals. This database can be used in two ways: firstly, the production of comparative statistics and, secondly, the survey data can be used as a set of harmonized micro data, rather than a series of national surveys, in which international variability is not the direct object of the measurement, but an additional factor of inter-individual variability providing more in-depth understanding of a given issue. The procedure adopted in the present work borrows from both approaches, as we use the micro-dimension to test in detail the influence of health and various aspects of working conditions on the wish to retire, while taking an interest in the differences in the prevalence of this wish from one country to another one.

2.2. Dependent variable: wishing to retire as early as possible.

For this study, we only selected individuals aged between 50 and 65 years old in 11 countries. We thus have a sample made up of 12,526 individuals, of whom 7,040 – i.e. 56.2% – are still in employment (table 1). The “not in employment” category relates to the unemployed, the retired and invalids or those on long-term sick leave. Housewives were not included.

These employment rates result from a multiplicity of factors, with regard to both labor supply and demand. The factors or groups of factors that interest us here relate to health status and working conditions. Rather than testing their impact on actual occupational behavior, the approach chosen consists in measuring their impact on the desired retirement age of individuals still in employment. This approach is explained by the fact that data relating to working conditions are only available for individuals who are still in employment, which prevents them from being used as explanatory variables in a model for effective participation in the labor market. It is also in line with our aim of focusing on the supply-side aspects of retirement behavior. Even if they can be influenced by demand side factors,

intentions are a priori closer to a pure measurement of the desire to continue or to stop working, while realizations are the joint outcome of individuals' and employers' decisions.

<< Tab 1 >>

Wishes in terms of retirement date are not measured in the form of a desired retirement age, but via the response to a question on the desire to retire "as soon as possible". The exact formulation of this question is "Thinking about your present job, would you like to retire as early as you can?" The breakdown per country of answers to this question is shown in the first line of table 2. The proportion of people expressing the desire to leave as soon as possible increases as we move from Northern to Southern Europe, with the exception of Switzerland. The figure reaches a peak at 67.4% in Spain, whereas its lowest level is reached in the Netherlands, with 30.7% (table 2).

2.3. Explanatory variables relating to working conditions and health

The variability of preferences in terms of retirement age results *a priori* from multiple factors that can also be linked to each other. Each employee's decision rests on an overall comparison between their individual characteristics (age, training, sex), their health status in relation or not to their work (stating that they are "in good health" or "limited activities", if employees have a job that they consider to be stressful or physically demanding) and finally the characteristics of their work and company. These factors may also be linked to one another: for example, a difficult or unsatisfying job can have an adverse effect on one's health and vice versa; poor health status can affect job satisfaction.

The continuation of table 2 shows measurements of work conditions and health status whose impact on the wish to retire as soon as possible was tested by us. The data relative to working conditions are either direct measurements of certain factors in terms of stress ("my job is physically demanding", "I am under constant time pressure due to a heavy workload", "I have very little freedom to decide how I do my work"), of the interaction between stress and health status ("I am afraid that my health will limit my ability to work in this job"), or measurements of satisfaction (or dissatisfaction) that are psychological ("I have an opportunity to develop new skills", "I receive adequate support in difficult situations", "I receive the recognition that I deserve for my work"), or more material in nature ("Considering all my efforts and achievements, my salary is adequate", "My job promotion prospects are poor"). Additional indicators are overall satisfaction ("All things considered, I am satisfied with my job") and the feeling of being exposed to the risk of unemployment ("My job security is poor"). The responses to these different questions were collected according to four modalities ("Strongly agree", "agree", "disagree", "strongly disagree"). We converted them into bimodal variables. The percentages recorded in the table are the percentages of the "agree" or "strongly agree" responses to each of the statements.

<< Tab 2-a >>

Concerning health status, our main indicator is self-reported health status categorized into four levels: “very good”, “good”, “fair” and “bad or very bad”. However, such an indicator exhibits considerable risks of self-reported bias (Bound, 1991). To limit this declaration bias and also to avoid influencing the results by the exclusive use of a single indicator, we combined this self-perceived health status with several more objective measurements: limitations of activities, the fact of suffering from one or more chronic diseases or from symptoms of depression.

2.4. Other explanatory variables

In addition to these health and working condition variables, we use several supplementary individual determinants that are also recorded in the survey. These include the usual socio-demographic determinants: level of education, marital status and spouse’s occupation. The latter two variables offer a summary control for the collective dimension of preferences regarding retirement age within the household.

We also mentioned above the importance that the literature gives to expectations, and particularly to subjective life expectancy. One could consider that this variable is already taken into account through self-reported health status. However, insofar as the survey also measures this directly through a question on the subjective probability of not reaching the age of 75 or over, we have chosen to introduce it explicitly. 17.9 % of men consider that this probability is higher than 50%, this proportion varying from 13.0% in Spain to 23.7% in Belgium. The same proportions are equal to 13.2 %, 8.0 %, and 15.3 % respectively for women. We expect people who anticipate low life expectancy to have a stronger preference for early retirement.

<< Tab 2-b>>

Two other anticipation variables were included with regard to imminent changes to the pension system. The idea that early departures may be motivated by the fear of new reductions in entitlements under the effect of new reforms is often put forward. It is said to be one of the impediments to the efficiency of the measures introduced in France in 2003 to encourage workers to postpone their retirement. Two questions were asked to individuals who have not yet retired: “what are the chances that before you retire the government will reduce the pension which you are entitled to?” and “what are the chances that before you retire the government will raise your retirement age?”. We use dummies indicating whether individuals consider these probabilities as higher than 20%. For instance, 32.3% of men consider that the probability of a decrease in pension levels is higher than 20%, while a figure of 30.4% is reached concerning the risk of an increase in retirement age. The latter is supposed to have a positive effect on the wish to leave as early as possible.

3. The impact of non-financial determinants: an initial analysis.

Our first two objectives are to identify the role of health status and working conditions as individual determinants of the wish to retire as soon as possible and to test how these two factors contribute to international disparities in the prevalence of this desire to retire early.

We shall first concentrate on the micro level, examining the results of a simple probit model (M1 model) that does not control for financial incentives or for selection bias. The results are given on the first column of table 3.

<< Tab 3 >>

According to this model, the variables that have the strongest explanatory power are global satisfaction with work and the fear that health problems will limit one's working capacity before normal retirement age: being globally satisfied with one's work reduces the probability of wishing to retire as soon as possible by 12.1 percentage points; the fear of being limited by a health problem before normal retirement age increases this same probability by 13.2 points. The effects are weaker but remain significant in general and in the direction expected for the other variables. For example, having poor promotion prospects increases this probability by 6.9 points while having little freedom in one's work decreases it by 5.4 points. Furthermore, receiving the recognition that one deserves for one's work lowers this probability by 7.3 points.

Physical strain and stress resulting from workload increase the desire to leave as soon as possible by 3.0 and 5.5 points respectively. The question on salary does not emerge as one of the most determinant factors, having a negative impact of 5.2 points. Consequently, overall satisfaction, recognition, integration in the company and fears with regard to one's future health status are the variables that have the greatest impact on the desire to leave as soon as possible rather than remuneration or occupational stress

As far as characteristics intrinsic to the individual are concerned, we find conventional determinants, namely that level of education has a negative influence on the desire to leave as soon as possible and that women who are in employment wish to remain so. Individuals who live in a couple want to leave earlier than others, especially if the spouse is also an employee.

Apprehension with regard to life expectancy has a significant positive effect on the desire to leave, especially for men. Men whose subjective probability of not surviving until the age of 75 is above 50% have a propensity to prefer early retirement higher by 5.4 points. For women, we find a correlation between the probability that the government will increase retirement age before they retire and the probability of wishing to retire as soon as possible (+ 5.2 points). Other expectation variables do not have a significant impact.

On the whole, this initial model leads to results that were expected, but it does not control for selection bias, i.e. the fact that it only applies to people that are still in employment. This selection bias should lead to underestimating the impact of variables that positively affect the wish to retire early if preferences for early retirement also depend on unobserved factors. Let us assume for instance that

individual preferences depend on both health status and a parameter of pure preference for leisure. Individuals who are in bad health but still in employment will be characterized by a lower than normal level of preference for leisure. The fact of remaining in employment despite bad health reflects a strong attachment to the job in question. Overrepresentation of these people in the selected sample will lead to underestimating the impact of bad health on the wish to retire early. In order to correct this selection bias, we use the two equation-framework (Greene, 2000) with one selection equation describing the fact of being in employment, the other equation being the equation of interest of model M1. These two equations are estimated jointly through maximum likelihood, taking into account the possible presence of a correlation between their residuals measured by coefficient ρ .

All the determinants of the wish to retire early are potential determinants of actual labor force status. It is therefore natural to use as explanatory variables of the selection equation all the explanatory variables that exist in the equation of interest, or at least all those available for both working and non working people, i.e. essentially all the variables from the M1 model except those pertaining to working conditions.

A few additional variables have been introduced in this selection equation. One is the fact of being or having been a public sector employee versus a private sector employee. This reflects the fact that, in most countries, public sector employees can retire younger than private sector employees. One can of course argue that such a variable can also affect the wish to retire earlier or later, but our position is to consider that if such is the case, this impact is mediated through working conditions that are already controlled in the equation of interest. This view is confirmed by the fact that this variable is not significant when introduced in this equation of interest.

The second variable absent from the equation of interest but introduced in the selection equation is age. Age is naturally a strong determinant of the fact of still being in employment. Its role in the desire to leave as soon as possible is less clear-cut. If we assume a stationary environment with preferences that are temporally consistent, expressing the wish to retire as soon as possible should be fully independent from the age at which the question is asked. Somebody who wishes to retire at 60 should express the same preference whether interviewed at 51, 52 or any age between 50 and 59. Such a hypothesis is of course rather extreme: an individual who has undergone health problems or productivity shocks can change his preference concerning retirement age. However, this assumption is relatively well confirmed once again, by the fact that age does not as appear to be significant when introduced directly in the equation of interest.

The last variable added to the selection equation is the decile of relative income within one's country. As in the case of the two previous variables, we attempt to introduce these deciles in the equation of interest. Here again, all the coefficients appeared to be non significant[1].

This variant, which corrects the M1 model for selection bias, is called M2. The results of the selection equation are given in the appendix: they are consistent with expectations. Examination of the ρ coefficient confirms the risk of a selection bias: this coefficient is positive and significant, suggesting

the presence of unobserved factors that simultaneously affect current employment status and preferences for retiring rapidly. Indeed, controlling for endogenous selection corrects some of the coefficients of model M1 in the expected direction. The impact of health status is more pronounced after controlling for selectivity, which is the case for the impact of subjective health status and the presence of chronic diseases. Apart from these corrections, the other coefficients are modified only slightly. All the variables that were already significant remain so. These results confirm our hypothesis about the underestimation if we do not take the problem of selection into account.

4. Reintroducing financial determinants

All in all, model M2 reinforces the messages of the M1 model. Non-financial determinants such as health and working conditions affect aspirations regarding retirement age very significantly, although this does not imply that these variables can account for the variations of preferences for early retirement observed between countries.

Let us take for example the case of France where gross preferences for early retirement are higher than the average. Certain descriptive data from Table 1 show that certain characteristics of French workers can contribute to this. Indeed, it can be seen that France has the lowest figures in terms of global satisfaction at work. At the same time, certain variables, such as health condition, impact on the preference for early retirement in the opposite direction. It is thus uncertain that the strongest preference for early retirement observed for France can be explained by the joint effect of working and health conditions.

This is precisely the message that arises from the comparison between the gross differentials between countries shown in table 2 and the net effects measured by the country dummies introduced in the M1 and M2 regressions. A systematic comparison is provided in figure 2. Net effects are lower than gross ones, but remain relatively large. For instance, the average propensity to desire early retirement was 20.3 points above the average in Spain in gross terms. It only falls to 15.8 after the controls. The hierarchy of countries is the same with and without controls. Correcting the impact of differences in health status and working conditions dampens inter-country differentials without eliminating them or changing their direction.

<< Fig 2 >>

[1] We tested several possibilities for introducing income and several forms of income and wealth (by individual, by household, household real assets net of any debts or household total gross income). All the results are very close to those presented in this paper.

Name	Estimation method	Exogenous variable	Selection equation	Country effects	Measurement of cross-country differentials
M1	Probit	Non financial variables	None	Dummy variables	Effect_1
M2	Heckman-probit		Non financial variables		Effect_2
M3	Heckman-probit	Non financial and financial variables		Derived from micro-residuals	Effect_3
M4	Heckman-probit				Effect_4
M5	Heckman-probit		Non financial and financial variables		Effect_5

This limitation of the explanation by non-financial determinants leads us to reconsider the role of financial determinants, or more-broadly speaking, the institutional determinants encompassing the various incentive characteristics of national pension systems. These determinants are relatively strongly differentiated from one country to another and former works have suggested that they account relatively well for variations of employment rates in older workers between these countries (Gruber and Wise, 1999; Blöndal and Scarpetta, 1998; Duval, 2003; Disney, 2004; Borsch-Supan, 2007). It is thus interesting to reintroduce these determinants in the analysis. In fact, our two M1 and M2 models are vulnerable to a criticism symmetrical to that often leveled at purely financial approaches, that is to say that since they are centered on non financial determinants, they completely rule out any impact of financial determinants. One cannot exclude a priori that these factors also play a role. For a given level of working conditions or for a given health status, the individual will be more or less inclined to prefer early retirement according to whether it is linked to a pension entitlement that is either very far removed or close to that which they could hope for if they retired later.

4.1. Measuring financial and institutional incentives for early retirement

The ideal way of dealing with this problem would be to introduce into the regression certain individual indicators of pension entitlements. This was done in a previous work that tried to evaluate the impact of these incentives on retirement behavior at micro level (Gruber and Wise, 2005). However, this requires detailed knowledge of pension rules in the different countries and information on the individual career profiles determining individual entitlements, both of which are unavailable in the Share survey. Lacking such information, we adopted a less systematic approach that relies on meso-economic data built by Queisser and Whitehouse (2007) and Whitehouse and Queisser (2007), who computed several indicators of financial incentives to retirement for several typical profiles of workers in all OECD countries.

The first indicator is replacement rate (RR), i.e. the ratio between the first pension and the last wage. Here we use the replacement rates for a departure at 60. The higher the replacement rate, the greater the wish to leave at this age. However, this indicator is only one very partial summary of pension entitlements and incentives. One complementary indicator is Social Security Wealth (SSW), i.e. the

actualized sum of pension entitlement throughout the retirement period. This indicator combines the effects of the replacement rate with life expectancy after retiring and the rules that govern pension indexation over the course of retirement.

Lastly, attention can be focused on the progression of entitlement when delaying retirement age. The higher the progression, the less one will be tempted to leave early. One way of measuring this progression is to compute the variation of SSW when one decides to retire at age a_r+d rather than a_r. More precisely, Queisser and Whitehouse provide values for SSW for departure at 60 and the increase in SSW gained by postponing retirement from 60 to 65. This variation is negative if there is no or little increase of the pension level according to retirement age, in which case late departures are relatively penalized, and positive if the replacement rate increases with age in a way that more than compensates for the reduced length of the retirement period.

One interesting aspect of the OECD data is that the incentive variables have been computed for several typical cases of workers in each country. Replacement rates and SSWs are computed in each country for individuals gaining 0.5, 0.75, 1, 1.5, 2 and 2.5 times the average income by country, and separately for men and women. Variations of SSW between 60 and 65 are available only for men, but here again for various income levels: 0.5, 1 and 2 times the average income by country. We used these latter indicators for both men and women. To process this information, we computed the position of each individual from the Share survey within the income scale of their country, and then allotted to them the incentive measures corresponding to the OECD cases closest to theirs. One limit of this procedure is that it is based on income data whose quality unfortunately remains very dubious. Nonetheless, it groups these income data in relatively large income brackets, removing part of the measurement problem, while the fact of only using data on relative incomes within each country also eliminates systematic biases since incomes may have been either systematically over-estimated in certain countries or systematically underestimated in others.

On the whole, we enrich our set of explanatory variables with three “pseudo-individual variables” whose expected effects are the following. All things being equal, a high replacement rate at age 60 should increase the probability of wishing to retire early. We expect this RR variable to come out with a positive sign. Variations of SSW between 60 and 65 should come out with a negative sign: if this variation is positive, i.e. if there is some financial gain in postponing, there should be a fall in the number of people wishing to retire as soon as possible. The effect is more ambiguous for SSW at age 60. *A priori*, it is an indicator of the system’s generosity and should positively affect the preference for early exit. However, for a given RR, a lower SSW value means a shorter length of retirement, either because the opening of entitlements comes late (after 60) or because life expectancy is low. A conjunction between pension rules and life expectancy that only allows a short retirement period encourages retirement as soon as is allowed by the legislation, in order to avoid the risk of having this retirement period shortened still further by premature death.

In fact, since this information was also available, we introduced into the regressions other institutional factors such as the minimum retirement age, with the difference between men and women when there was one. One can consider that the effect of this minimum age is also ambiguous. It depends on the way in which the question was included/understood by the respondents. A priori, individuals for whom

the minimum retirement age is late can consider that leaving "as soon as possible" is simply impossible for them and thus answer negatively. But if the question was understood as meaning "retiring as soon as possible within the window allowed by the pension system", then one can expect more positive answers in countries where this window is late. The later the initial age of eligibility, the higher the probability that it is later than the ideal retirement age.

4.2. The intention to retire early seems more elastic to non financial variables than to financial incentives

Two other changes were made to models M1 and M2. Firstly, the introduction of these “pseudo-individual” financial variables into the regression equations implies that we should reconsider our method of estimating country effects. These variables retain a certain amount of infra-national variability, and their introduction is thus not completely incompatible with the presence of country dummies. However, their variability is rather low. To avoid a situation of quasi-colinearity we preferred to abandon country dummies that appeared in models M1 and M2. The country effects provided from now on will be estimated as averages of individual residuals measured in each country. To check the incidence of this new method of computing country effects we first estimate a model identical to M2, but without these country dummies. This model is labeled M3.

<< Tab 4 >>

Secondly, two specifications were tested for the selection equation, with or without the incentive variables. *A priori*, these incentive variables must enter the selection equation, and the proper model is the model in which these variables enter both the selection equation and the equation of interest (model M5). We also tested the effect of these incentive variables with the same selection equation as for models M2 and M3 (model M4).

All in all we tested three new models: a model M3 similar to M2 but without country dummies; a model M4 similar to M3 in which we added incentive variables but with the same selection equation as in M2 and M3; and a model M5 in which the incentive variables are simultaneously introduced in the selection equation and the equation of interest.

We shall not go into the details of the new selection equations. The appendix gives only the new selection equation of the M5 model, whose coefficients always take the expected direction, except for the absence of effect of SSW. As in the interest equation, the effect of SSW on the probability of being in employment is ambiguous, in particular if we take into account RR and the variation of SSW.

If we continue with the equation of interest (cf table 4), models M4 and M5 show that there is a simultaneous effect of monetary and non monetary variables. The effects of non monetary variables are hardly modified compared to models M1 and M2. Concerning monetary variables, the variation of SSW between 60 and 65 has the negative effect that was expected and this effect is significant. The effect is positive and is also consistent with replacement rate expectations. The impacts of the level of SSW and minimum retirement age are, on the other hand, non significant, but this is consistent with the fact that they were ambiguous *a priori*. The SSW in level comes out with a negative sign that is not

significant. The minimum age comes out with negative signs for men and women and is significant only for the latter.

Is it possible to compare the relative strengths of these financial or institutional and non financial factors? Doing so through contributions to micro-variability in our variable of interest would of course be misleading. Financial variables are measured with very little individual heterogeneity, so that we cannot expect them to contribute greatly to the explanation of individual variability.

However, we can do two things. The first is to compare the values of the coefficients of the two categories of variables. The question is to know whether intentions to retire quickly are more or less elastic to health status and job satisfaction than they are to financial or institutional incentives. The second thing that can be done is to assess the contributions of the two groups of variables in the analysis of cross-national rather than micro-variations in the wish to retire as soon as possible.

Let us start with the comparison of coefficients. The validity of this comparison relies on the assumption that coefficients of financial variables estimated on the basis of cross national variations provide us with reasonable proxies of coefficients that could have been estimated by using more detailed micro-measurements of financial incentives. If we accept this assumption, the message is that it is the non financial factors that appear to dominate. For instance, the coefficient of 0.18 for the rate of replacement means that a variation of 10 points of this replacement rate only raises the wish to leave as soon as possible by 1.8 points, an effect which appears considerably weaker than the majority of the effects shown in figure 2. The impact of SSW variations can be analyzed in the same way. These variations are expressed as a percentage of wages. This means that an increase of SSW between 60 and 65 corresponding to 50 % of the yearly wage lowers the probability of wishing to leave as soon as possible by only three percentage points. All this is relatively low compared to the effects of most of the non financial variables.

4.3. Financial or institutional parameters explain a larger share of cross-country differentials

However, this moderate impact of financial factors at the microeconomic level does not necessarily mean they play a weak role in explaining average cross-country differentials. We have seen that the strength of the effects of health and working conditions at individual level was not enough to give them a considerable explanatory role at international level, due to the lack of international variability of these variables. The contrary can occur for financial factors: explanatory variables that have a relatively limited impact at individual level can nevertheless contribute significantly to cross-country differentials if cross national differences in these incentives are large.

<< Fig 3 >>

To check this, we re-compared the gross national differences and net country effects, the latter now measured as averages of individual residuals rather than with country dummies (see figure 3, where countries are again ordered by decreasing magnitude of gross effects). We first observe that country effects resulting from model M3 (effect_3) are not very different from those obtained from models with

dummies, giving credence to the new estimation procedure. On the other hand, whereas the control of non financial variables did no more than simply attenuate cross-country differentials without eliminating them, the control of financial variables had a much greater impact, at least in certain cases (models M4-effect_4 and M5-effect_4). If we let aside the exceptions of Austria, Spain and Belgium, for which the control of financial factors does not modify the country-effect, we find that these country effects are significantly dampened compared to gross effects for a large number of countries and are reduced to almost zero and even slightly reversed for Germany, France, Denmark, Switzerland, Greece, Sweden and Italy.

5. Conclusion

At this stage, our results can be summed up in the following way. Firstly, health and work conditions matter for explaining preferences on retirement age. This result is not new but the Share survey provides a new validation of it, using a rather large sample with a relatively diversified range of indicators. Secondly, financial incentives, although measured in a very imperfect way, also have a significant effect at individual level but this nevertheless seems less marked than that of the non financial variables. Thirdly, this hierarchy is reversed when attention is focused on the power of financial/institutional and non financial variables for explaining differentials of average preferences across countries. The role of financial factors seems comparable and even greater than that of non financial factors. The effects of pension entitlements even seems to fully account for apparent national specificities for countries like Germany, France, Denmark, Switzerland, Greece, Sweden and Italy.

To sum up, the results provide a relative reconciliation between the two contradictory views that favor either financial, or non-financial determinants of retirement behavior. Both factors matter a lot, but at different levels. As far as international differences are concerned, an explanation based on incentive structures of national pension schemes is more relevant than an explanation based on differences in average health or working conditions, whatever the strength of the impact of these factors at individual level.

These results established with the first wave of the Share survey need to be confirmed. The measurements of the financial determinants used here remain very partial and exhibit little infra-national variability. The comparability of survey data across countries also remains an issue. Even if particular care has been taken to perform this comparability, it may be that answers to the same questions cannot always be interpreted according to the same terms in different countries. These results nevertheless provide encouragement for continuing in the direction of multifactor approaches to retirement behavior.

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Fig. 1: Determinant of Labor Force participation of older worker

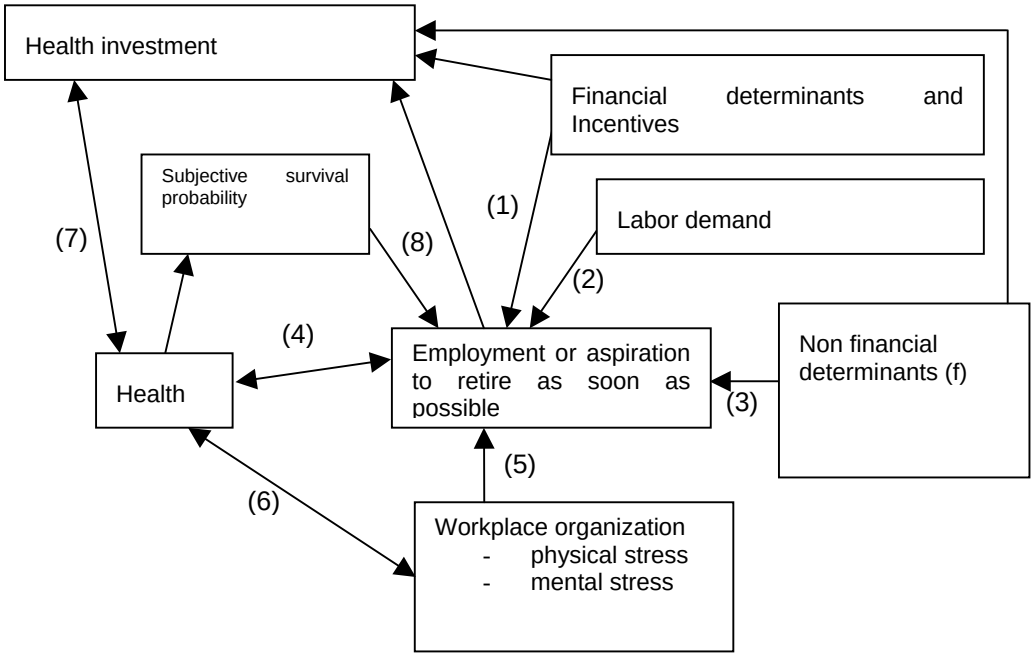

Table 1. Labor force participation by country.

	In employment		Out of employment		Total	
Austria	322	35,3	591	64,7	913	7,3
Germany	798	55,0	654	45,0	1452	11,6
Sweden	1142	69,9	492	30,1	1634	13,0
The Netherlands	783	61,9	481	38,1	1264	10,1
Spain	435	58,7	306	41,3	741	5,9
Italia	429	40,6	627	59,4	1056	8,4
France	746	55,3	604	44,7	1350	10,8
Denmark	556	61,6	347	38,4	903	7,2
Greece	692	63,4	400	36,6	1092	8,7
Switzerland	344	74,0	121	26,0	465	3,7
Belguim	793	47,9	863	52,1	1656	13,2
Total	**7040**	**56,2**	**5486**	**43,8**	**12526**	**100,0**

Table 2: Descriptive statistics (% of total employed population between 50 and 65)

	AU	GE	Swe	NL	SP	Il	Fr	DK	GR	Swi	Bel	Total
Dependent variable												
Wishing to retire as soon as possible	51.2	43.4	42.2	30.7	67.4	59.0	57.2	42.3	55.1	32.8	34.3	45.6
Explanatory variables												
1. Job satisfaction												
All in all I am satisfied with my work	93.5	93.2	95.0	94.1	92.7	89.5	90.2	95.5	82.7	97.1	92.8	92.3
My work is physically demanding	53.4	44.3	43.8	43.5	44.0	65.8	40.9	46.6	58.6	37.2	47.8	47.1
I am constantly under pressure because of a heavy workload	62.7	71.6	54.8	39.5	49.8	64.7	49.3	59.4	62.5	54.9	51.2	55.8
I have very little freedom in how I carry out my work	34.8	29.8	17.9	18.2	31.9	34.2	21.6	24.3	34.3	22.4	27.4	25.7
I have the opportunity to develop new skills	71.1	75.1	83.8	82.0	54.8	58.4	61.7	86.2	54.5	82.0	69.9	72.0
I receive appropriate support in difficult situations	70.8	75.1	77.6	80.2	76.8	57.7	64.3	79.3	62.5	79.4	72.6	72.8
I receive due recognition for my work	73.0	78.2	78.2	80.4	75.2	61.9	55.6	77.7	67.8	83.1	73.4	73.3
For the work I do my salary is correct	63.0	60.6	51.0	69.6	49.8	49.5	53.8	61.3	54.5	82.8	63.8	59.0
My promotion prospects are not good	61.2	70.0	74.1	52.3	69.0	72.3	63.7	67.3	68.0	57.3	54.9	65.0
My chances of keeping my job are not good	19.3	21.8	18.8	32.0	13.5	26.7	18.4	18.9	27.7	20.1	22.7	22.1
Worry that health status will limit capacity to go on working until normal retirement age	26.7	21.1	30.1	21.2	54.3	24.9	24.8	24.3	27.5	9.3	32.4	27.1
2. Health status												
Very good	31.4	22.3	42.1	26.7	18.7	16.9	23.3	35.1	41.9	45.1	30.4	30.9
Good	48.4	56.3	37.0	58.1	58.6	57.5	58.1	50.8	45.4	45.3	56.5	51.4
Fair	18.0	18.3	18.4	14.3	18.4	23.0	15.4	11.8	11.6	8.7	12.2	15.5
Bad and very bad	2.2	3.1	2.5	0.9	4.3	2.6	3.2	2.3	1.1	0.9	0.9	2.2
At least one limitation of activity	29.8	26.8	29.7	34.2	22.0	17.6	20.8	26.8	10.8	22.4	21.3	24.3
No chronic disease	59.6	52.7	52.4	54.2	47.3	46.9	45.5	45.8	52.6	62.8	44.6	50.7
One chronic disease	25.5	30.3	31.4	30.9	30.7	33.2	33.9	32.5	31.8	25.3	34.0	31.4
Two chronic diseases or more	14.9	17.0	16.2	14.9	22.0	20.0	20.6	21.7	15.7	11.9	21.4	17.9
Being depressed	14.0	12.1	13.3	12.5	20.0	23.2	27.1	13.6	14.7	14.0	19.0	16.4

Table 2: Descriptive statistics (% of total employed population between 50 and 65)

	AU	GE	Swe	NL	SP	II	Fr	DK	GR	Swi	Bel	Total
3. Expectations												
For men												
The probability that the gov. decreases my pension level before I retire is higher than 20%	28.6	30.8	25.3	24.5	41.4	39.7	26.6	36.1	45.0	42.2	31.5	32.3
The probability that the gov. increases retirement age before I retire is higher than 20%	20.5	25.7	20.9	25.4	44.1	36.4	23.5	33.6	46.7	32.0	36.5	30.4
My probability of dying before 75 is higher than 50%	21.7	16.4	14.8	16.0	13.0	15.5	16.6	16.0	26.4	18.0	23.7	17.9
For women												
The probability that the gov. decreases my pension level before I retire is higher than 20%	20.5	25.6	27.6	15.3	28.9	24.4	25.5	32.1	17.4	33.7	20.7	24.2
The probability that the gov. increases retirement age before I retire is higher than 20%	16.1	20.4	22.8	18.8	29.1	24.4	24.7	30.3	19.4	24.4	28.6	23.4
My probability of dying before 75 is higher than 50%	17.4	17.0	12.3	8.9	8.0	10.7	17.8	11.1	13.6	11.3	15.3	13.2
4. Other socio-demographic variables												
Female	42.5	47.5	53.1	43.1	41.2	39.6	51.0	46.8	31.1	44.4	43.0	44.8
Education level secondary	45.3	50.7	22.4	27.7	18.1	30.7	36.0	44.2	30.8	25.3	31.1	32.6
Tertiary education level	41.6	41.8	40.3	34.1	15.9	19.7	31.0	44.9	32.8	32.0	34.4	34.6
Self employed	19.3	15.6	12.1	14.5	28.3	34.6	12.7	10.9	38.9	24.4	16	19.1
Contributes to a public pension scheme	18.3	9.6	12.5	25.7	33.2	19.7	13.3	5.2	52	7.6	22.8	20
Contributes to a private pension scheme	70.6	63.7	76.9	20.8	61.1	58.6	20.6	30	46.1	32.9	65.6	50.5
Contributes to both kinds of schemes	2.9	2	0.9	0	1.3	22.5	0.6	0.7	2.5	0	0.9	2.3
Contributes (or entitled) to another kind of scheme	8.6	24.9	9.7	53.5	4.9	3.4	65.6	64.1	0.7	59.6	10.9	27.7
In couple	76.7	83.7	84.2	87.4	79.7	84.7	77.2	81.6	78.3	79.2	84.8	82.3
Spouse working	28.1	37.6	40.3	34	16.2	17.2	37.1	42.6	19.7	32	33.3	32.5
Spouse not working	16.2	19	11.4	23.3	20.1	26.3	18.2	12.1	21.6	12.9	23.9	18.6
Unknown working status for spouse	32.4	27.1	32.5	30.1	43.4	41.2	21.9	26.9	37	34.3	27.6	31.2

Table 3: Non monetary determinants of the probability of wishing to retire as soon as possible (equation of interest)

	***Probit* M1**		***Heckman Probit* M2**	
	marginal effect		marginal effect	
	estimated	t-stat	estimated	t-stat
Satisfaction at work				
All in all I am satisfied with my work	-12.12	-4.61	-11.94	-4.58
My work is physically demanding	3.01	2.20	3.18	2.33
I am constantly under pressure because of a heavy workload	5.47	4.12	5.31	4.01
I have very little freedom in how I carry out my work	5.41	3.55	5.25	3.47
I have the opportunity to develop new skills	-4.19	-2.70	-4.52	-2.94
I receive appropriate support in difficult situations	-3.10	-1.98	-3.18	-2.05
I receive due recognition for my work	-7.32	-4.53	-7.09	-4.42
For the work I do my salary is correct	-5.23	-3.81	-5.23	-3.83
My promotion prospects are not good	6.90	4.98	6.93	5.00
My chances of keeping my job are not good	3.43	2.20	3.30	2.13
Worry that health status will limit capacity to go on working until normal retirement age	13.25	8.38	12.74	8.07
Health status				
Good (ref very good)	7.40	4.91	7.57	5.04
Fair (ref very good)	7.92	3.42	9.69	4.26
Bad and very bad (ref very good)	9.35	1.91	15.18	3.29
At least one limitation of activity	2.01	1.20	3.44	2.03
One chronic disease (ref none)	2.68	1.83	3.28	2.25
Two chronic diseases or more (ref none)	3.87	2.07	5.12	2.75
Being depressed	-0.32	-0.17	-0.08	-0.04
Expectations				
Probability of an increase in retirement age (men)	-1.99	-1.06	-1.19	-0.63
Probability of a decline in the pension level (men)	0.07	0.04	0.62	0.33
Probability of dying before 75 (men)	5.45	2.98	5.23	2.91
Probability of an increase in retirement age (women)	5.17	2.48	5.63	2.74
Probability of a decline in the pension level (women)	-0.10	-0.05	0.39	0.19
Probability of dying before 75 (women)	0.56	0.27	0.39	0.19
Other variables				
Female	-8.17	-3.59	-8.27	-3.65
Education level secondary	-0.69	-0.42	-1.59	-0.96
Tertiary education level	-7.75	-4.60	-9.27	-5.42
Self employed	-10,60	-6,07	-13.30	-7.45
Contributes (or entitled) to another kind of scheme	2,58	1,35	-3.00	-0.60
Contributes to a public pension scheme	-3,38	-0,68	-3.26	-0.68
Contributes to a public and a private pension scheme	-3,68	-0,76	-1.44	-0.29
Spouse working	9.88	5.27	8.69	4.66
Spouse not working	6.23	3.28	5.44	2.88
Unknown working status for spouse	8.86	4.16	8.94	4.31
Country				
Germany	3.44	0.97	4.69	1.32
Austria	13.61	3.21	16.41	4.22
Belguim	-7.40	-2.08	-5.21	-1.43
Sweden	3.87	1.13	4.05	1.19
The Netherlands	-8.07	-2.32	-7.43	-2.11
Spain	24.58	6.18	23.90	7.19
Italy	15.51	3.81	17.09	4.61
France	15.75	4.50	16.47	5.11
Denmark	3.30	0.90	4.19	1.15
Greece	15.20	4.08	16.03	4.66
Log-likelihood	- 4298		- 4288	
Dependency test (ρ)			- 0,23	19.158

Figure 2: Cross-country differentials after controlling non monetary factors

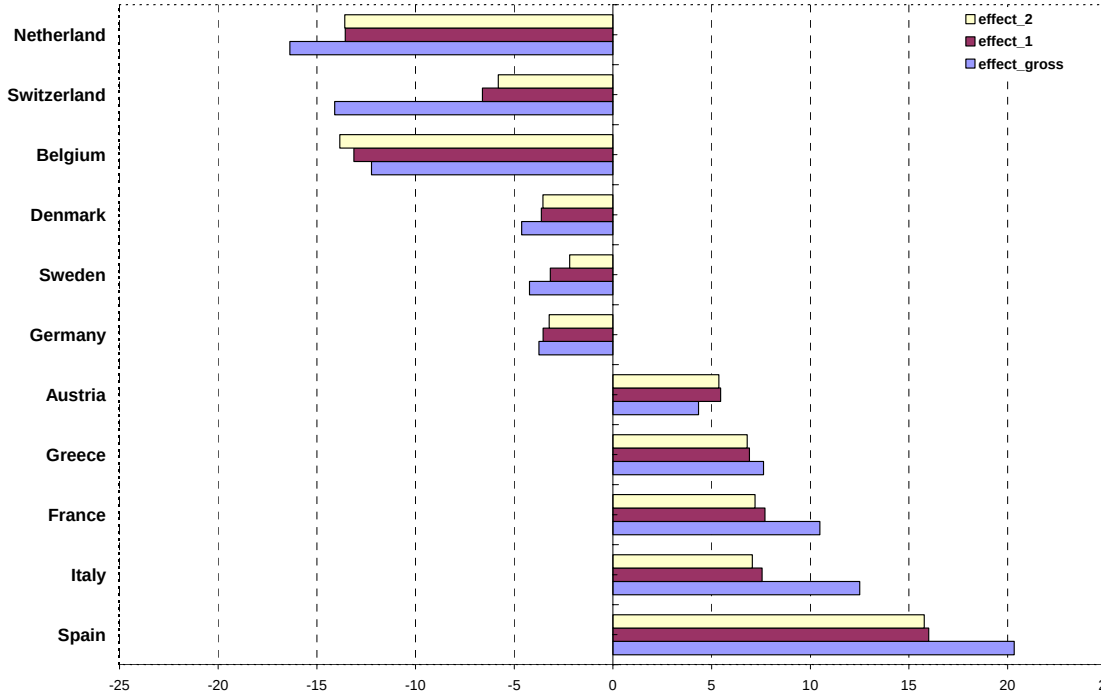

Figure 3: Cross-country differentials before and after controlling for monetary and non monetary factors

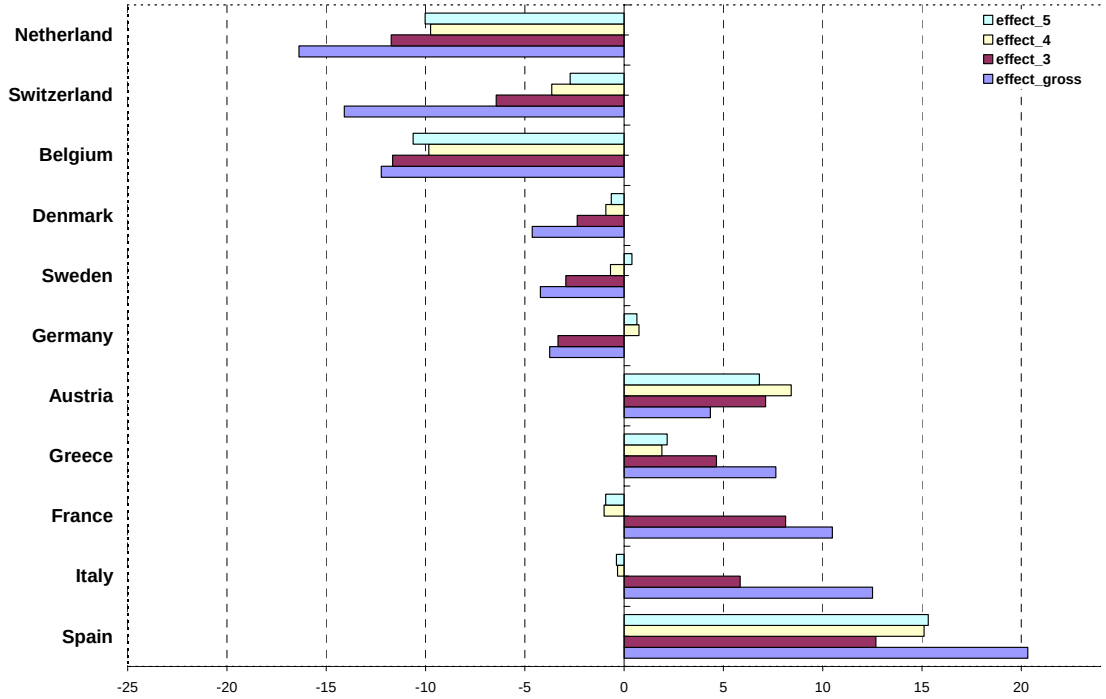

Table 4: Monetary and non-monetary determinants of the probability of wishing to retire as soon as possible (equation of interest)

	***Heckman Probit* M3**		***Heckman Probit* M4**		***Heckman Probit* M5**	
	marginal effect		marginal effect		marginal effect	
	estimated	t-stat	estimated	t-stat	estimated	t-stat
Satisfaction at work						
All in all I am satisfied with my work	-11.94	-4.62	-11.44	-4.43	-11.52	-4.44
My work is physically demanding	2.37	1.77	2.11	1.57	1.92	1.43
I am constantly under pressure because of a heavy workload	6.10	4.69	6.51	4.98	6.60	5.05
I have very little freedom in how I carry out my work	5.62	3.76	5.88	3.94	5.84	3.89
I have the opportunity to develop new skills	-7.26	-4.83	-5.87	-3.87	-5.63	-3.70
I receive appropriate support in difficult situations	-3.41	-2.22	-2.85	-1.85	-2.81	-1.82
I receive due recognition for my work	-7.89	-4.99	-6.62	-4.16	-6.65	-4.16
For the work I do my salary is correct	-6.29	-4.67	-5.96	-4.42	-6.09	-4.50
My promotion prospects are not good	8.00	5.87	8.26	6.04	8.46	6.18
My chances of keeping my job are not good	0.88	0.58	1.14	0.75	1.07	0.70
Worry that health status will limit capacity to go on working until normal retirement age	13.84	9.03	14.31	9.30	14.46	9.37
Health status						
Good (ref very good)	8.23	5.63	7.77	5.28	7.73	5.24
Fair (ref very good)	10.99	4.92	10.81	4.83	10.54	4.67
Bad and very bad (ref very good)	17.71	3.97	17.99	4.09	17.02	3.77
At least one limitation of activity	0.11	0.07	1.57	0.94	1.20	0.72
One chronic disease (ref none)	3.12	2.16	2.90	2.01	2.86	1.97
Two chronic diseases or more (ref none)	5.02	2.72	4.90	2.66	4.74	2.56
Being depressed	0.93	0.52	-0.25	-0.14	-0.31	-0.17
Expectations						
Probability of an increase in retirement age (men)	0.20	0.11	0.21	0.11	0.21	0.11
Probability of a decline in the pension level (men)	1.24	0.67	1.10	0.60	0.95	0.51
Probability of dying before 75 (men)	4.01	2.25	4.03	2.26	4.02	2.24
Probability of an increase in retirement age (women)	6.88	3.41	7.29	3.63	7.40	3.66
Probability of a decline in the pension level (women)	0.33	0.16	0.09	0.04	-0.31	-0.15
Probability of dying before 75 (women)	0.48	0.24	-0.09	-0.04	-0.02	-0.01
Other variables						
Female	-8.27	-3.65	-8.76	-3.90	-8.68	-3.85
Education level secondary	-1.84	-1.18	-1.63	-1.04	-1.71	-1.08
Tertiary education level	-9.71	-5.94	-9.23	-5.60	-9.29	-5.57
Self employed	-9.85	-5.64	-11.04	-6.28	-10.61	-6.03
Contributes (or entitled) to another kind of scheme	-7.45	-1.58	-4.25	-0.86	-4.15	-0.84
Contributes to a public pension scheme	-8.93	-1.95	-4.35	-0.90	-4.13	-0.86
Contributes to a public and a private pension scheme	-8.70	-1.86	-6.68	-1.35	-6.36	-1.28
Spouse working	6.55	3.54	6.76	3.64	6.98	3.74
Spouse not working	4.79	2.56	4.88	2.59	5.08	2.68
Unknown working status for spouse	7.17	3.48	7.12	3.46	6.91	3.33
Financial incentives						
Replacement rate at 60			0.18	1.91	0.15	1.64
SSW at 60			-0.66	-1.04	-0.68	-1.05
Variation of SSW for postponing retirement from 60 to 65			-0.06	-1.87	-0.06	-1.81
Minimum retirement age (men)			-0.96.	-1.28	-0.93	-1.23
Minimum retirement age (women)			-1.91	-3.39	-1.87	-3.31
Log-likelihood	- 4398		- 4365		- 4368	
Dependency test (ρ)	- 0.21	15.91	- 0.24	21.39	- 0,20	14.16

Table A.1: Determinants of the probability to be in employment (selection equation).

	Probit (M2)		Probit (M5)	
	Coefficient	**t-stat**	**Coefficient**	**t-stat**
I am (was) in public employment	0.17	4.38	0.03	0.75
I am (was) self-employed	0.85	19.52	0.76	17.84
Health status				
Good (ref very good)	-0.03	-0.85	-0.07	-2.14
Fair (ref very good)	-0.40	-8.43	-0.40	-8.77
Bad and very bad (ref very good)	-1.09	-14.88	-1.03	-14.29
At least one limitation of activity	-0.30	-8.87	-0.28	-8.35
One chronic disease (ref none)	-0.03	-0.99	-0.05	-1.46
Two chronic diseases or more (ref none)	-0.09	-2.39	-0.10	-2.65
Being depressed	-0.12	-3.43	-0.13	-3.74
Socio-demographic variables				
In couple	0.03	1.01	0.11	3.15
Education level secondary	0.06	1.87	0.06	1.77
Tertiary education level	0.26	7.01	0.32	9.00
Age				
52-53	-0.13	-2.22	-0.13	-2.31
54-55	-0.30	-5.52	-0.30	-5.59
56-57	-0.57	-10.41	-0.56	-10.32
58-59	-0.86	-15.68	-0.81	-14.92
60-61	-1.52	-27.19	-1.44	-26.25
62-63	-1.85	-31.48	-1.77	-30.61
64-65	-2.39	-36.53	-2.26	-35.26
Decile of income				
2^e	-0.19	-3.12	-0.39	-6.94
3^e	-0.03	-0.50	-0.23	-4.04
4^e	0.06	0.96	-0.15	-2.71
5^e	0.17	2.82	-0.05	-0.83
6^e	0.28	4.70	0.06	1.06
7^e	0.27	4.42	0.07	1.24
8^e	0.24	3.89	0.05	0.87
9^e	0.33	5.16	0.13	2.19
1^e	0.27	4.30	0.07	1.11
Country				
Germany	-0.57	-6.05		
Austria	-1.22	-12.32		
Belgium	-1.18	-12.74		
Sweden	-0.02	-0.21		
The Netherlands	-0.54	-5.65		
Spain	-0.54	-5.30		
Italy	-1.06	-10.77		
France	-0.88	-9.25		
Denmark	-0.55	-5.58		
Greece	-0.86	-8.86		
Financial incentives				
Replacement rate at 60			-0.02	-9.88
SSW at 60			0.23	15.12
Variation of SSW for postponing retirement from 60 to 65			0.01	13.85
Minimum retirement age (men)			0.01	0.77
Minimum retirement age (women)			0.03	3.06
Constant	1.73	19.05	-1.94	-3.08
Log-likelihood	- 5700		- 5816	