What are the Motivations of Pathways to Retirement in Europe: Individual, Familial, Professional Situation or Social Protection Systems?

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Individual, Familial, Professional Situation or Social Protection Systems[1]*

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Abstract

The aim of this research is to identify the determinants of pathways to retirement in Europe and, by measuring the influence or combined influence of individual, contextual and institutional domains on labor force participation, to better understand inter-country variations in the employment rates of older citizens. The dataset consists of both the first two longitudinal waves of SHARE (2004-2006) and some macroeconomic series from the OECD describing three complementary social protection systems (pensions, disability, employment). The analysis is simultaneously carried out in terms of "stocks" (labor force participation in 2004) and "flows" (pathways from employment in 2004 to retirement in 2006). Indicators are developed to measure the contribution of each domain (individual, contextual, institutional), and their various combinations to the employment rate of older citizens, and their role in explaining inter-country differences. As expected, results demonstrate that labor force participation and the decision to retire are determined by the various individual and contextual domains with social protection systems, each playing a significant role. Institutional determinants explain most of the inter-country differences. There appears to be a complementary effect between the different categories of social protection, and the global effect of the three systems combined is greater than the sum of the idiosyncratic effect of each system. Future public policies aiming at increasing the workforce participation of older citizens should therefore take into account that retirement decisions are determined by complex, interactive and individual determinants, and that within the European Union, the main convergence factors are to be found in the differences in social protection systems.

Key words: Social Protection, Social Security, Retirement, Ageing, Health, Europe

Classification /JEL Codes: I10, I18, J21, J28

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Résumé

L'objectif de cette recherche consiste à appréhender le processus de départ à la retraite des seniors et de mieux comprendre les différences entre les pays européens, au regard des différentes dimensions – individuelle, familiale, professionnelle, et institutionnelle – qui sont susceptibles d'influencer l'offre de travail. Pour cela, nous utilisons les données longitudinales de l'enquête SHARE (2004-2006) complétées par des séries macroéconomiques provenant de l'OCDE et décrivant trois systèmes de protection sociale (emploi, retraite et santé). L'identification des déterminants de l'emploi a été menée simultanément en termes de « stock » (la participation à l'emploi des seniors en 2004) et de « flux » (transition emploi-retraite entre 2004-2006). Des indices permettant de mesurer le rôle des différentes dimensions dans l'explication des différences entre les pays ont ensuite été développés. Les résultats sont de trois ordres : (1) les déterminants de la participation à l'emploi et du passage à la retraite sont nombreux et multi-dimensionnels. (2) Chaque élément de la protection sociale (emploi, retraite et santé) influe sur l'emploi des seniors. Il semble exister une complémentarité entre ces différents systèmes. (3) L'explication des différences entre les pays en ce qui concerne la participation à l'emploi et le passage à la retraite trouve son origine principalement dans les déterminants institutionnels. Dès lors, toute politique publique qui aurait pour but une augmentation du taux d'emploi des seniors devrait reposer sur ces deux postulats : premièrement, elles doivent tenir compte de la complexité des déterminants de la décision des individus et de leurs interactions ; deuxièmement, les principaux facteurs de convergence au sein de l'Europe sont à rechercher dans les différences systémiques.

Mots clefs : Protection sociale, Retraite, Vieillissement, Santé, Europe.

1. Introduction

One of the key structural weaknesses observed in European Union labour markets is the low employment rate of older workers. As of 2001, member states officiating at the Helsinki European Council officially stated their intentions to reach a 50% employment rate among citizens aged 55 to 64 by 2010. The latest Eurostat statistics tend to corroborate this since, on average, employment rates rose from 36.4% in 1977 to 44.7% in 2007. Although a common trend towards higher employment rates is undeniable, this average increase, however, masks extremely heterogeneous cross-country situations. In certain countries, 2010 goals have already been exceeded, notably in Sweden (70%), Denmark (58.6%), the United Kingdom (57.4%) and Germany (51.5%), whereas in Austria (38.6%), France (38.3%), Belgium (34.4%) and Italy (33.8%) employment rates remain largely inferior. These variations have their origin in a number of different determinants. The question of where to situate causality leads to two hypotheses: differences in labor force participation rates, on the one hand, are seen as a demand deficiency driven by economic constraints (Aubert, Blanchet and Blau, 2005) and, on the other, are determined by personal choices motivated by health, family environnement, labour market structure or inter-country differences in social protection systems.

Our research takes the second approach. More precisely, our aim is to identify the determinants of labor force participation and pathways to retirement in older workers through the analysis of 'stocks' (labor force participation) and 'flows' (withdrawal from the labour market to retirement). In addition to the usual factors such as individual characteristics and household structure, we also explore the role of social protection systems in the broad sense of the term. To date, labour supply analyses essentially either concentrate on personal determinants or provide a partial analysis based on the influence of one social protection system: for example, pensions (Blanchet and Debrand, 2007) or disability (Börsh-Supan, 2007). The influence of one single system on the retirement decision can, however, be seriously questioned (Gruber and Madrian, 1995; Gruber and Wise, 1998). The existence of alternative and complementary means of prematurely withdrawing from the labour market before the eligible retirement age, such as unemployment and invalidity, suggests that the different social protection systems should be approached as an interacting whole rather than separately.

In order to achieve this, we use datasets from the first two waves of the longitudinal SHARE survey (2004-2006) completed by macroeconomic series from the OECD describing the three social protection systems common to all European countries: systems relating to labour and unemployment, those relating to sickness and invalidity, and those relating to retirement and pensions. The first section of this article provides a review of empirical literature based on three groups of determinants: individual, contextual (household characteristics and workplace environment), and institutional. The second section provides a detailed presentation of the datasets, the selected sample, and the analysis method. The results are presented and commented in the section preceding the conclusion.

2. Review of existing literature

Given the diversity of determinants influencing the retirement decision, we abandon the usual financial and non-financial distinctions (Blanchet and Debrand, 2007) in favour of three interacting domains: individual characteristics (personal data), immediate environment (contextual data) and social protection system in which the individual lives (institutional data). As these domains are naturally interactive, certain determinants can belong to any one or other of the three groups.

2.1. Individual determinants

Among the most commonly used variables in determining individual retirement decisions such as age, nature and level of education, health status is of paramount importance. Several empirical works demonstrate that health status, and more particularly the notion of disability, is one of the determinant variables in workforce participation and, by extension, in the labour supply of older workers (Currie and Madrian, 1999). Even if the relationship between health status and labour supply appears obvious, understanding causality can nevertheless prove complex if not ambiguous (Strauss and Thomas, 1998). Two effects appear to simultaneously play in opposite directions: work conditions can be the source of health deterioration at the end of the working cycle and, at the same time, poor health can be the cause of withdrawal from the labour market. It is therefore essential to take this circular causality into account when interpreting apparent relationships between health and labour market status (Anderson and Burkhauser, 1985).

Anticipated life expectancy is another health-related indicator with an idiosyncratic effect on the retirement decision. In effect, economic theory postulates a certain number of mechanisms through which this indicator modifies individuals' behaviour in the face of retirement: a wealth effect at the end of the life cycle, an uncertainty effect on savings, and an effect related to the risk of longevity. Hurd and McGarry (1995) and Hamermesh (1985) suggest that respondents have a fairly good idea of their probability of living to 75 years old. For Hurd, McFadden and Merrill (1999), the probability of survival is related to both health status and predicted life expectancy. Individuals thus appear to have quite a fairly precise idea of their individual life expectancy and adjust their retirement decision by estimating their life expectancy after retirement (Hurd, Smith and Zissimopoulos, 2004). Other expectations can also have an impact on the retirement decision such as anticipating future pension reforms.

2.2. Household characteristics and professional environment

'Contextual' effects attempt to explain the interactions or relationship between an individual's immediate environment and their personal situation, more specifically family situation and work conditions. The family context plays an important role in retirement preferences and decisions, notably illustrated by the problem of coordinating a married household's projected retirement dates. Classic economic models assume that within a household, retirement decisions are taken independently. The unit of reference is thus taken as being the individual rather than the household but in this context, the decision to withdraw from the labour market is rarely taken individually. It seems likely that the preference for 'leisure' has greater value if the spouse has already exited the labour market (the complementarity of preferences for 'leisure' hypothesis). Household revenue permitting, it would appear logical that both members of a couple seek to coordinate their retirement dates as closely as possible. Among the other social constraints weighing on individual decisions, the spouse's or another family member's health status can have a significant influence on the decision to retire (the internalisation of constraints relating to the health of a spouse or dependent parent hypothesis). Although existing literature indicates a negative relationship between labour supply and the provision of informal care (Charmichael and Charles, 1998; Spiess and Schneider, 2003; Heitmueller, 2007), it has been unable to firmly establish the direction of causality from the latter to the former (Fevang et al., 2009).

The second contextual effect explored concentrates on the relationship between health and work conditions. Research into this issue requires a multidisciplinary approach. Karasek and Theorell (1990) and Siegrist (1996) developed models revealing the impact of work conditions on health status. Over the last thirty years, European countries have been faced with a deep transformation of their productive base creating a source of anxiety for their employees and, more particularly, older workers (Hamermesh, 2001; Wanner, 1999, Askenazy and Caroli, 2002). Accentuated by the current crisis affecting all western economies, job satisfaction, lack of support, and job insecurity can thus affect the retirement decision to the same extent as health status (Väänänen *et al.,* 2004; Ferrie *et al.,* 2005).

2.3. The role of social protection systems

Even if there is some convergence among European countries in terms of public policies and legislative and regulatory frameworks, each system nevertheless remains distinct by virtue of its historical context, government priorities, and also the apprehension a country's residents can feel regarding forthcoming reforms.

In the 1980s and 1990s, European countries set up early retirement systems as part of an employment policy aimed at countering the threat of mass unemployment and absorbing the shock of industrial restructuring in the modernisation of its production base. Confronted with the failure of this employment policy and the costs it generated, collective early retirement schemes were progressively abandoned and replaced by initiatives to promote active ageing. Different initiatives have been implemented in each country: measures favouring the 'employability' of older workers, partial or gradual retirement, or even increasing the statutory retirement age. Over the last few years, health status has increasingly gained in importance; new 'individualised' schemes such as invalidity pensions and schemes allowing early retirement for health reasons have been created. Initially designed as benefits to compensate against a deteriorated health status, they do not, however, always benefit the entire population in poor health. Entitlement criteria effectively differ significantly throughout Europe and correspond more to institutional differences than real differences in health status (Börsh-Supan, 2007).

Economic literature analysing the impact of social protection systems on retirement decisions essentially focuses on financial determinants or, in other words, the different rights acquired through age, gender, salary, etc. Whether it concerns pension schemes or invalidity schemes, financial considerations are a major factor affecting retirement decisions. Explicative models of the work to retirement transition frequently refer to a choice between 'leisure' and work influenced by pension levels (at the replacement rate) and expected pension wealth during retirement (Duval, 2003; Gruber and Wise, 1999; Blöndal and Scarpetta, 1998). Labour supply can also be affected by invalidity schemes (Börsh-Supan, 2007; Börsh-Supan *et al.*, 2005) where the amount and duration of benefits granted on disability can be equivalent to a salary. Legal or statutory eligibility must, however, be taken into account in both pension and invalidity systems: for example, the statutory retirement age, health criteria defining invalidity, etc. A third system that may be brought to intervene in the retirement decision relates to employment protection and unemployment. In this context, Campioleti (2002) considers regional unemployment rates in Canada as a determinant factor in the labour supply of older workers. Numerous studies, in effect, focus their research on one or other of these three social protection systems, (for example: Gruber and Kubik, 1997; Friedberg, 1999; Madrian, 1994; Börsch-Supan, 2000; Rust and Phelan, 1997; Bohn, 1999; Asch, Aider and Zissimopoulos, 2005; Gruber and Madrian, 1995; Gruber and Wise, 1998; Gruber, 2000), but to our knowledge no study to date takes into account the simultaneous effect of the interactions between the three systems.

3. Data and methods

The simultaneous analysis of the different domains influencing retirement decisions in Europe necessitates the use of datasets comparable between countries and the cohorts concerned. Recent developments in the EU statistics production (via the OECD) have moved in this direction, notably to allow the definition of sufficiently personalised details to study individual choices in their complex environment.

3.1. Sources

In order to study the dynamics of retirement, or in other words the reasons for which workers decide or not to retire, we use personal data from the *Survey of Health, Ageing, and Retirement in Europe* SHARE uses a sample made up of 20,000 households (of which at least one member is aged 50 or over), interrogated in 2004 and again in 2006 in eleven European countries[3]. SHARE is a longitudinal, international and multidisciplinary survey. The first two survey waves permit the identification of workforce participation in 2004, moves from work to retirement between 2004 and 2006, and the individual and contextual determinants motivating these work-to-retirement transitions.

Institutional variables describing the social protection systems are taken from OECD data[4]. Analysing such factors ideally requires national microdata describing the rights acquired by each individual in each of the three social protection systems to be included in the analysis. Already difficult to obtain for a single country and one system (Gruber and Wise, 2005 for pensions), the obtention of truly comparable individual data in eleven countries for three systems becomes arduous if not insurmountable. In view of this, we opted for the homogeneous inter-country indicators produced by the OECD for the social protection systems and, where possible, differentiated variables according to specific individual characteristics (gender, income quartiles). The indicators finally retained in the analysis are as follows:

Retirement: For each individual, the most basic indicator measures the difference between the minimum statutory retirement age (by gender) in each country and the actual age of the individual concerned (Distret). This variable is expected to act positively if an individual is employed and negatively on retirement. Two finer indicators, created by Whitehouse and Queisser (2006), describing financial incentives were then used. The first measures the replacement rate at the age of 60 (Nrrmean) and is expected to have a negative sign if the individual is employed and a positive sign on retirement. The second indicator measures the variation in pension wealth for an individual deciding to retire at 65 rather than at 60 (Dsswmean). The pension wealth indicator (i.e. the actuarial present value of benefits that a person would receive by retiring), combining the effects of replacement rate, life expectancy and adjusted accrued pension, is complementary to the replacement rate at 60 indicator. The analysis is nevertheless fairly complex and results can be contradictory. On the one hand, the three arguments on which it is based theoretically have opposite effects on the fact of being employed or retired. On the other hand, variations in pension wealth measure the accrual of pension rights according to retirement age. The higher the value of accrued rights, the more it is in employees' interests to delay retirement. Theoretically, it should act positively on being employed and negatively on retirement.

Sickness and disability: We retained two synthetic indicators relating to the percentage of the population covered by invalidity systems (Coverage) and the generosity of these systems (Bengen). *A priori*, the first indicator should be negatively correlated to retirement due to the complementary effect of social protection systems whereas the second should be positively correlated. The direction of these correlations should be inversed in the labor force participation equation.

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[3] Borsch-Süpan *et al.* (2005).

[4] Sources: for pension systems, Whitehouse and Queisser (2006); for the other social protection systems: 'OECD Employment Outlook (OCDE, 2004) for the system relating to job protection and unemployment, and 'Transforming Disability into Ability"(OCDE, 2003) for the sickness and invalidity system.

Social protection on the labour market: We retained a synthetic indicator describing employment protection legislation (EPL) and unemployment rate (by gender) in 2004 (Newumrate). The effect of these indicators can differ according to the time period or job category taken into account. For example, the unemployment rate is both an overall economic indicator (highly correlated to the GDP) and an indicator of the state of the labour market. OECD said about its EPL indicator[5]: "*The literature on EPL highlights positive and negative effects on labour market performance. Among the former, it highlights the benefits of long-term employee-employer contracts including greater willingness to invest in on-the-job training. Among the latter, is the concern that workers hired on regular contracts may enjoy a high degree of employment security to the detriment of other workers hired on temporary contracts. In addition, employment protection may diminish firms' ability to cope with a rapidly changing environment driven by globalisation, technological change, and the derived organisational innovation. The effects of EPL on labour market performance are a controversial subject, both in theory and in applied research.*"

3.2. Econometric options

Our analysis is carried out using two phases. In the first phase, determinants for the labor force participation and pathway to retirement in Europe are found by using a two-stage equation system. Secondly, from the results of the preceding estimations, we propose a methodology to apprehend factors explicative of inter-country differences. Models specification requires not to introduce country indicator variables since it would be redundant with the information already provided by system-level variables. Finally, the intention to explain inter-country differences would require a global analysis using the totality of all the national samples. All things considered, to estimate the work-to-retirement determinants, we use a labour market mobility equation of the type:

$$y = I_{y^* > 0} \text{ with } y^* = X_y^{'} \beta_y + \varepsilon_y \text{ where } \varepsilon_y \approx \mathrm{N}\left(0, \sigma_y^2\right) ;$$

where y^* is a latent variable describing 2004 employees' retirement from the labour market between 2004 and 2006, and $X_y^{'}$ is a vector of variables describing observable individual characteristics. This equation (the interest equation) concerns solely employed individuals in 2004. So, $y = 1$ means that an individual employed in 2004 is retired in 2006, and $y = 0$ means that an individual employed in 2004 is still working in 2006 (see Table 1). Here, individuals not working in 2004 are ignored. This first equation does not take into account that individuals employed in 2004 have specific characteristics in relation to other individuals susceptible of transiting from work to retirement in 2006 or later. As there is no single 'pathway' to retirement, the selection perhaps lacks neutrality for the envisaged estimation. We thus use a selection equation of labour market participation in 2004 written as follows:

$$w = I_{w^* > 0} \text{ with } w^* = X_w^{'} \beta_w + \varepsilon_w \text{ where } \varepsilon_w \approx \mathrm{N}\left(0, \sigma_w^2\right) ;$$

where $X_w^{'}$ is a vector of variables describing observable individual characteristics and w^* is a latent variable describing employees activity in 2004. w^* = 1 for salaried individuals in 2004 and $y = 0$ for the others.

From there, the conditional probability of an individual deciding to retire knowing that the individual was salaried in 2004 is written as follows:

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5   For instance, see Nickell (1997), Elmeskov, Martin and Scarpetta (1998), Heckman, and Pages (2000), Blanchard et Wolfers (2000), Bertola, Blau and Kahn ((2002).

$$P\left(y=1\middle|w=1\right)=\frac{\Phi_2\left(X_w^{'}\beta_w,X_y^{'}\beta_y,\rho\right)}{\Phi\left(X_w^{'}\beta_w\right)}.$$

$\Phi(\ )$ is a normal cumulative distribution function and $\Phi_2(\ )$ is a bivariate normal cumulative distribution function where ρ is the correlation coefficient between interest and selection equation residuals. If $\rho=0$, the selection has no effect on the retirement determinants and the two equations can be estimated separately. If $\rho\neq0$, the two equations must be estimated simultaneously. This two-stage equation model is estimated by the maximum likelihood method. This method enables the simultaneously study of labour market participation and the retirement decision. The analysis is thus simultaneously carried out in terms of 'stocks' (*i.e.* the selection equation) and 'flows' (*i.e.* the interest equation).

Table 1: Sample selection

Equation of selection ('stocks' approach):		
Condition in 2004	*Condition in 2006*	*N*
y=1 Employed	Employed or retired	4515
y=0 Unemployed, retired, disabled	Unemployed, retired, disabled Employed or retired	2625
Total*		7140
Equation of interest ('flows' approach):		
Condition en 2004	*Condition en 2006*	*N*
w=1 Employed	Retired	657
w=0 Employed	Employed	3858
w=. Unemployed, retired, disabled	Employed or retired	2625
Total*		7140

Note: (*) Respondents present in both survey waves, whose age in wave 1 is between 50 and 64 inclusive (that is 8419 individuals) and where the selection equation conditions are met– i.e. are considered as missing, respondents whose status in wave 1 is 'other unemployed or without precision' (47 indiv.), and those where the transition to retirement in wave 2 are 'other than towards work or retirement' (1232 indiv.).

Potential selection bias corrected using the two-stage equation system presents two advantages. In the first place, the influence of diverse situations on the retirement pathway can be taken into account and ensures that the analysis of the different forms of social protection is coherent. Our results of course remain specific to the sub-population being studied and cannot therefore be generalised since, as indicated in Table 1, not all the transitions are recorded. The second advantage of this approach lies in the fact that it simultaneously permits the study of labor force participation in 2004 and the transition to retirement in 2006.

The explanatory variables $X_w^{'}$ in the workforce participation equation (selection equation) are:

Individual dimension: age, household structure, education level, status of the last employment (public or private sector employee, self-employed), self-reported health status and the subjective probability of not living until 75 years old (differentiating men from women).

Contextual dimension: spouse's situation in terms of employment, spouse's self-reported health status, and whether assistance or care is provided to another person.

Institutional dimension: for pensions (replacement rate, accrued pension variation between the age of 60 and 65, difference in pension entitlement), for illness and disability (population covered and generosity of the system) and for employment (unemployment rate according to type, indicator describing the severity of employment legislation).

The specification of $X_y^{'}$ in the pathway to retirement equation (equation of interest) is as follows:

Individual dimension: age, household structure, education level, status of the last employment (public or private sector employee, self-employed), self-reported health status, and the subjective probability of not living until 75 years old (differentiating men from women). A variable measuring the time span between individual interviews carried out in waves 1 and 2 of SHARE survey is equally added so as to correct potential temporal effects.

Contextual dimension: the spouse's situation in terms of employment, the spouse's self-reported health status, whether assistance or care is provided to another person, and two variables describing job characteristics in 2004 (job satisfaction and whether there is feeling of job insecurity).

Institutional dimension: we use the same indicators retained as explanatory factors in labor force participation.

Given the list of independent variables retained, *k* different models will be estimated. In the reference model, age and gender only are taken into account. In the model (m1) household size, public sector, self-employment, the spouse's employment status, and job satisfaction are added. In the model (m2) we complete with health variables and life expectancy. The variables presented in these first models correspond to the individual and contextual domains. In the models (m3 – m6) we introduce the three institutional domains (pensions-disability-employment) alternatively then simultaneously. Finally, in the model (m7), we take into account the variables indicated previously to which are added expectations concerning pension system reforms.

3.3. Measuring and explaining the differences in labor force participation between countries

In the second phase, we attempt to measure the role of these determinants in explaining the differences between European countries. As outlined in the introduction, despite the seemingly collective trend towards increasing the employment rate of older workers in Europe, inter-country disparities remain significant. Following the example of Blanchet and Debrand (2007) and Bolin *et al.* (2008), the influence of each domain (individual, contextual, institutional) in explaining inter-country differences is calculated. This was achieved by using indicators of absolute and relative deviation between countries for each dataset.

To measure the relative and absolute deviation between national situations, we use predictions from the different *k* estimations that depend on the explanatory variables present in the models. $P_{i,j}^{ref}$ is the predicted value from the model including the reference variables (age and gender) for the individuals *i* in the country *j* and $P_{i,j}^{est_k}$ is the predicted value from the model m1,… , m7 (k=1,…,7). This is written $P_{.,j}^{ref}\left(=\frac{1}{n_i}\sum_{i=1}^{n_i}\left(P_{i,j}^{ref}\right)\right)$ for the "reference model" estimated average percentage of individuals *i* in the country *j*; and $P_{.,j}^{est_k}\left(=\frac{1}{n_i}\sum_{i=1}^{n_i}\left(P_{i,j}^{est_k}\right)\right)$ for the *estimated* average percentage of individuals *i* in the country *j* with the variable include in the model k .

The absolute indicator is determined by the absolute deviation in average predictions according to country; in other words the difference between the two extreme values for the different determinants included in the regressions:

$$I_{abs}^{k}=100\left(1-\frac{\max(P_{.,j}^{est_k})-\min(P_{.,j}^{est_k})}{\max(P_{.,j}^{ref})-\min(P_{.,j}^{ref})}\right)$$

We can determine this indicator for the 8 different models (m1-m8). For the participation equation there are only 7 models, the 8th corresponds to the subjective probability that the Government reduces pensions (see tables 3 and 4). The standard error of difference between the two means and the population-weighted average for each country is then calculated: (n_j is the population of one of the 11 countries and $N = \sum_j n_j$ the total population of the 10 countries), or:

$$E^k_{.,j} = P^{ref}_{.,j} - P^{est_k}_{.,j} \qquad \text{and} \qquad E^k_{...} = \frac{1}{11} \sum_{j=1}^{11} \frac{n_j}{N} \left(E^k_{.,j} \right)$$

From this point we can determine the mean square error:

$$MSE^k = \frac{1}{11} \sum_j^{11} \left(E^k_{.,j} - E^k_{...} \right)^2$$

Indicators of relative differences between countries can then be defined for the 8 models retained (m1-m8):

$$I^k_{rel} = 100 \left(1 - \frac{MSE^k}{MSE^{ref}} \right)$$

If the difference between countries is solely due to differences in the distribution of the characteristics taken into account in the 8 models, the indicator values should be equal to zero. If, on the other hand, indicator values are not equal to zero and are modified by the introduction of new characteristics, it means that the introduced characteristics are explanatory factors in inter-country differences. The difference between the two indicators is essentially due to the weighted average prediction ($E^k_{...}$) being taken into account; the second indicator takes into account the relative weight of each country and the first only takes into account the absolute differences between extremes whatever the size of the country. These two indicators can just as well be created for the equation of interest concerning the transition to retirement between 2004 and 2006 as the selection equation concerning labor force participation in 2004.

4. Results

After a rapid presentation of the descriptive statistics, we will now focus on the labor force participation equation (equation of selection) by emphasizing the role of the three domains (individual, contextual, institutional) to arrive at an understanding of the transition from work to retirement. In the first phase, the determinants for each of these two equations are explained and, in the second phase, the determinants of the intra-European differences are revealed.

4.1. Descriptive statistics

The first series of statistics (see Tables 2 and 3) reveal the differences in characteristics between workers that retired between 2004 and 2006 and those that were still working in 2006. Thus, the retirement set concerned more individuals in the older age range, more public sector employees but less self-employed workers, more households and even more couples in which the spouse is not employed, more employees declaring relatively poor job satisfaction, and more individuals in relatively poor health. If we look at life-expectancy expectations, a difference between individuals still working and those that have retired emerges: this effect is positive for men and negative for women. It is impossible to demonstrate real differences for the systemic indicators using descriptive statistics. The only notable differences concern social security wealth. This indicator, however, differs according to country, income and gender, as with the others indicators relating to retirement.

4.2. The 'stocks' approach: labor force participation in 2006

Estimations from the selection equation reveal the influence of the usual determinants in the labor force participation of older workers (see Table 4). At the individual level, all other factors being equal, the probability of being employed logically decreases with age; increases significantly the higher the level of education or among self-employed individuals. In line with the existing literature, we equally confirm the paramount influence of health status on employment probability since the probability of being employed is higher among respondents in good health (self-reported good health, expectancy to live until 75 for women). Contextual variables equally play an important role since a spouse's employment situation will have an influence on whether or not an individual remains at work. The probability of being employed is thus higher if the spouse is employed. In conformity with the majority of research on this theme, we equally observe that the provision of informal care (either within or outside the household) lowers the probability of being employed.

Concerning the institutional domain, the characteristics of social protection systems do have an influence on whether an individual is economically active or not. When each system is studied singly, we observe for the pension system: the probability of being employed is lower for high replacement rate values and high net pension wealth values. Fairly logically, the greater the 'distance' from the minimum statutory retirement age, the higher the probability of being employed. For sickness and disability systems, we mainly observe a positive link with the indicator concerning the percentage of the population covered by disability benefits. For the institutional variables concerning the labour market, we classically find a positive effect from the job protection system indicator and a negative effect of unemployment rate on the individual probability of being employed.

To explain inter-country differences, the absolute and relative indicators presented previously are used. In this context, individual and contextual determinants explain 30.6% of inter-country difference, that is to say a 14.0% reduction in the difference between absolute effects. The introduction of labour market indicators have little explanatory value concerning inter-country differences (for the labour market I_{abs}=36.2% and I_{rel} =10.1%). Inversely, the retirement system specificities explain the differences between countries (I_{abs} = 42.9% and I_{rel} = 24.8%). Sickness and disability indicators strongly explain inter-country differences (I_{abs} = 72.7%; I_{rel} = 50.3%). In

effect, since the end of the 1980s, the majority of European countries have implemented more and more systems favouring health-related withdrawals from the labour market (Börsh-Supan, 2004, 2007).

4.3. The 'flows' approach: exits from the labour market between 2004 and 2006

All other things being equal, the analyses confirm the key observations noted with the descriptive statistics (see Table 5). Age, gender, level of education, family situation, professional situation, and job satisfaction are effectively determinants in the retirement decision as is an altered health status between 2004 and 2006.

Furthermore, effects from the variables specific to the equation of interest are as expected. Job satisfaction or the fear of losing ones job are factors that delay the retirement decision in the same way as good health or an improvement in health status between the two survey waves. Finally, expectations concerning future pension reforms are not statistically related to the retirement decision, but expectations regarding an increase in the statutory retirement age play an important role. An explanation could be that employees are more sensitive to the statutory retirement age, or that they have internalised the fact that age-increase reforms are generally more 'rapid' than those increasing pensions.

Concerning institutional effects, we observe the supposed influence of each system according to the different estimated models. Fairly logically, the probability of moving from employment to retirement increases with high observed values in the variation of social security wealth, and the generosity of sickness and disability systems. Inversely, the move from employment to retirement is negatively correlated the further the distance from the statutory retirement age, the coverage rate of disability systems, and unemployment levels.

Our second interrogation concerns the explanation of inter-country differences in terms of the percentage of individuals moving from employment to retirement (see Table 2). Understanding these differences in flow brings us an additional element in understanding inter-country variations in unemployment rates. The introduction of additional individual determinants in the baseline model (where age is the only variable taken into account as the reference estimation) does not significantly explain inter-country differences. Similarly, adding health variables only explain 2.9% of inter-country variance (I_{rel}) and 3.4% of absolute deviance (I_{abs}). On the contrary, the introduction of social protection systems one after the other, then simultaneously explains the principal differences between countries in the move from employment to retirement. Incorporating indicators describing the retirement systems increases explained inter-country variance to 25.4% (I_{rel}) and absolute deviance variation (I_{abs}) to 15.0%. These effects are comparable with the indicators describing sickness and disability systems (26.4 % of inter-country variance and almost 14% of the absolute deviation), but the indicators relating to employment provide no information in understanding the differences between countries. Finally, if we take into consideration the three systems simultaneously, 68.3% of inter-country variance (I_{rel}) and 34.6% of absolute deviation (I_{abs}) is explained. These statistics are superior to the sum of the effects of systems taken singly. This result once again accredits the theory of complementary between social protection systems.

Conclusion

The subject of this research was to understand the process leading from employment to retirement among older workers and to better understand how the individual, contextual and institutional domains susceptible of influencing labour supply explain differences between European countries. Our aim was thus twofold: firstly, to find determinants explaining the move from employment to retirement and, secondly, to attempt to understand the differences between European countries. A simultaneous approach in terms of labor forces 'stocks' and 'flows' was made possible thanks to the longitudinal datasets from SHARE (2004, 2006) survey limited to older persons (aged 50-64) susceptible of being in employment.

The results on the determinants show that in the individual domain, age, health status, level of education, or household structure have an impact on the retirement decision. In the contextual domain, we find confirmation that workplace conditions and the spouse's position on the employment market influence the retirement decision. The three social protection domains (pensions, disability and employment) are equally significant determinants in the retirement decision. From that point, these initial results corroborate the existence of a multitude of explicative factors concerning the transition from employment to retirement.

The second aim of this article was to better understand the differences between European countries. The individual and contextual determinants as a whole do not contribute in explaining these differences. In other words, behaviours in the transition from work to retirement are comparable between European countries from the viewpoint of age, gender, level of education, health status, family situation, and professional environment. Inversely, the characteristics of the three social protection systems explain the vast majority of inter-country differences (I_{rel} et I_{abs}). In detail, these systems have a lesser influence when they are considered individually, and are dominated by pensions and disability systems. Yet, if the collective effect of the three systems is superior to the sum of idiosyncratic effects, one could conclude that there exists a form of complementary effect between social protection systems. This theory is all the more likely since a system is rarely created *ex-nihilo*, but rather created and gauged according to other existing systems. This being the case, the differences between countries are not to be sought in the differences between individual socio-economic characteristics but in the differences between national social protection systems.

On the basis of these results, any European social policy aiming to increase the employment rate of older citizens should be based on two pillars. Firstly, they should take into account the complexity of determinants affecting the retirement decision. And, secondly, converging factors should be sought within the heterogeneous European institutional systems, and take into consideration the totality of social protection systems and not simply those relating to pensions. As such, public policies aiming to increase the employment rate of older citizens should propose global multi-system reforms and not simply focus on one social protection system.

Table 2 – Description of numbers of individuals by country according to status on the labour market

Country	Economically active in 2004		Unemployed in 2004	Total
	Still economically active in 2006	Retired in 2006		
Austria	148	50	336	534
Germany	319	71	252	642
Sweden	650	98	246	994
The Netherlands	382	74	158	614
Spain	184	34	112	330
Italy	196	65	384	645
France	400	68	304	772
Denmark	329	65	142	536
Greece	500	35	246	781
Switzerland	207	22	50	279
Belgium	515	74	393	982
Total	**3,830**	**656**	**2,623**	**7,109**

Table 3 – Descriptive statistics

	Total		Economically active in 2004		Transition to retirement between 2004-2006	
	Average	E-type	Average	E-type	Average	E-type
Status on the labour market						
Transition to retirement			0.146			
In employment	0.631					
Age range						
50-51	0.131		0.193		0.011	
52-53	0.140		0.199		0.044	
54-55	0.137		0.184		0.105	
56-57	0.133		0.152		0.130	
57-58	0.130		0.125		0.239	
59-60	0.131		0.078		0.165	
61-62	0.131		0.052		0.221	
63-64	0.067		0.018		0.085	
Education level						
Lower	0.355		0.311		0.380	
Medium	0.323		0.320		0.302	
upper	0.315		0.363		0.311	
Health						
Good healh in 2004	0.434		0.508		0.424	
Still in good health (2004-2006)	0.271		0.327		0.261	
Deterioration between 2004-2006	0.163		0.181		0.163	
Improvement between 2004-2006	0.104		0.107		0.087	
Never in good health (2004-2006)	0.461		0.385		0.489	
Expectations						
Live until 75 years old (female)	0.281		0.292		0.267	
Live until 75 years old (male)	0.350		0.357		0.392	
Gvt. increases statutory retirement age	0.279		0.395		0.198	
Gvt. reduces pensions	0.294		0.413		0.271	
Survey characteristics						
Time between waves 1 and 2 (in months)	28.236	4.816	28.260	4.829	28.546	4.436
Family environment						
Spouse in good health	0.265		0.293		0.241	
Spouse of working age and in employment	0.305		0.387		0.258	
No spouse	0.360		0.363		0.343	
Children in the household	0.539		0.643		0.334	
Provides informal care	0.160		0.153		0.146	
Professional environment						
Private sector employee	0.661		0.637		0.643	
Public sector employee	0.179		0.175		0.203	
Freelance worker	0.157		0.188		0.152	
Satisfied with job	0.615		0.917		0.886	
Afraid of losing one's job	0.517		0.778		0.774	
Social protection systems						
Nrrmean	79.411	19.230	79.134	19.541	78.304	18.597
Dsswmean	-18.323	31.110	-17.857	32.222	-11.268	26.837
Distret	2.682	5.042	4.574	4.522	0.942	3.856
Coverage	3.430	1.042	3.582	1.057	3.492	1.088
Bengen	3.062	1.375	3.211	1.412	3.245	1.366
Newumrate	7.783	2.522	7.650	2.557	7.391	2.350
EPL	2.233	0.507	2.231	0.526	2.182	0.498
N° of observations	**7109**		**4486**		**656**	

Table 4 – Equation of selection: workforce participation

	(m1)		(m2)		(m3)		(m4)		(m5)		(m6)		(m7)	
Gender	0.00		0.06	*	0.15	**	0.10	*	0.14	**	0.01		0.13	**
52-53	-0.18	**	-0.16	*	-0.16	*	-0.01		-0.13		-0.15	*	0.02	
54-55	-0.41	**	-0.37	**	-0.38	**	-0.05		-0.33	**	-0.36	**	0.01	
56-57	-0.85	**	-0.79	**	-0.79	**	-0.30	**	-0.77	**	-0.80	**	-0.27	**
57-58	-1.17	**	-1.12	**	-1.11	**	-0.47	**	-1.12	**	-1.12	**	-0.46	**
59-60	-1.75	**	-1.70	**	-1.71	**	-0.89	**	-1.73	**	-1.71	**	-0.88	**
61-62	-2.11	**	-2.03	**	-2.03	**	-1.07	**	-2.05	**	-2.04	**	-1.05	**
63-64	-2.40	**	-2.35	**	-2.35	**	-1.25	**	-2.40	**	-2.36	**	-1.26	**
Medium			0.06		0.02		0.01		0.11	**	0.03		0.12	**
Upper			0.42	**	0.34	**	0.30	**	0.36	**	0.33	**	0.33	**
Public sector employee			-0.16	**	-0.15	**	-0.09	*	-0.05		-0.10	**	-0.01	
Freelance worker			0.60	**	0.57	**	0.65	**	0.64	**	0.63	**	0.72	**
Spouse in good health			0.09	**	-0.01		0.01		-0.06		-0.02		-0.03	
Spouse employed			0.50	**	0.50	**	0.48	**	0.42	**	0.48	**	0.38	**
No spouse			0.23	**	0.21	**	0.21	**	0.17	**	0.20	**	0.17	**
Children in the household			-0.01		0.00		0.02		0.03		0.02		0.05	*
Provides informal care			-0.14	**	-0.15	**	-0.16	**	-0.16	**	-0.15	**	-0.17	**
Good health in 2004 (female)					0.39	**	0.42	**	0.33	**	0.38	**	0.36	**
Live until 75 yrs old (w(Femme)					0.20	**	0.18	**	0.16	**	0.16	**	0.16	**
Live until 75 yrs old (male)					0.06		0.04		0.06		0.05		0.05	
Nrrmean							-0.22	**					-0.46	**
Dsswmean							-0.35	**					-0.25	*
Distret							0.08	**					0.09	**
Coverage									0.21	**			0.35	**
Bengen									0.06	**			-0.02	
Newumrate											-0.09	**	0.02	
EPL											0.24	**	0.27	**
Cst	1.31	**	0.94	**	0.72	**	0.11		-0.16		0.92	**	-1.58	**
Nobs	7109	.	7109	.	7109	.	7109	.	7109	.	7109	.	7109	
R²	0.25	.	0.29	.	0.30	.	0.31	.	0.33	.	0.31	.	0.34	.
LL	-3529	.	-3323	.	-3254	.	-3214	.	-3143	.	-3222	.	-3085	.
Inter-country variance	148.7		115.07		103.15		84.923		40.645		94.847		16.36	
I*rel*			22.6		30.6		42.9		72.7		36.2		89.0	
Maximum deviation	40.68		36.556		34.983		30.578		20.234		36.584		11.261	
I*abs*			10.1		14.0		24.8		50.3		10.1		72.3	

Note : * p<5%, ** p<1%

Table 5 – Equation of interest: transition from employment to retirement

	(m1)		(m2)		(m3)		(m4)		(m5)		(m6)		(m7)		(m8)	
Time between wave 1 - 2	0.00		0.01		0.01		0.00		0.00		0.00		-0.01		-0.01	
52-53	0.54	**	0.53	**	0.52	**	0.40	**	0.52	**	0.53	**	0.34	*	0.34	*
54-55	0.97	**	0.93	**	0.93	**	0.67	**	0.93	**	0.92	**	0.55	**	0.55	**
56-57	1.10	**	1.06	**	1.05	**	0.67	**	1.09	**	1.04	**	0.53	**	0.53	**
57-58	1.53	**	1.51	**	1.51	**	0.97	**	1.62	**	1.48	**	0.89	**	0.91	**
59-60	1.41	**	1.44	**	1.46	**	0.77	**	1.64	**	1.41	**	0.77	**	0.83	**
61-62	1.88	**	2.02	**	2.05	**	1.19	**	2.30	**	1.96	**	1.33	**	1.41	**
63-64	1.89	**	2.06	**	2.11	**	1.11	**	2.44	**	1.99	**	1.32	**	1.42	**
Public sector employee			0.20	**	0.20	**	0.21	**	0.18	**	0.21	**	0.15	**	0.15	**
Freelance worker			-0.20	**	-0.21	**	-0.15	**	-0.29	**	-0.16	**	-0.38	**	-0.40	**
Satisfied with job			-0.30	**	-0.29	**	-0.35	**	-0.30	**	-0.31	**	-0.36	**	-0.36	**
Afraid of losing job			-0.11	*	-0.11	*	-0.13	**	-0.12	*	-0.10	*	-0.15	**	-0.16	**
Spouse in good health			-0.14	**	-0.12	*	-0.13	**	-0.10		-0.13	**	-0.11		-0.11	
Spouse employed			-0.15	**	-0.16	**	-0.19	**	-0.17	**	-0.16	**	-0.24	**	-0.22	**
No spouse			-0.20	**	-0.19	**	-0.22	**	-0.21	**	-0.19	**	-0.25	**	-0.26	**
Children in the household			-0.11	**	-0.11	**	-0.08	**	-0.14	**	-0.09	**	-0.12	**	-0.12	**
Provides informal care			0.00		-0.01		-0.03		0.01		-0.01		0.01		0.04	
Deterioration between 2004-2006					-0.14	**	-0.14	**	-0.10		-0.15	**	-0.17	**	-0.17	**
Improvement between 2004-2006					-0.06		-0.07		-0.06		-0.07		-0.12		-0.14	
Never in good health (2004-2006)					-0.20	**	-0.20	**	-0.16	*	-0.21	**	-0.18	*	-0.19	*
Nrrmean							0.11						0.25		0.26	
Dsswmean							1.08	**					1.01	**	0.93	**
Distret							-0.07	**					-0.11	**	-0.11	**
Coverage									-0.23	**			-0.43	**	-0.47	**
Bengen									0.09	**			0.11	*	0.12	**
Newumrate											-0.03	*	-0.07	**	-0.07	**
EPL											-0.07		-0.17		-0.18	
Gvt. increases retirement age															-0.30	**
Gvt. reduces pensions															-0.08	
Cst	-2.48	**	-1.99	**	-1.94	**	-0.89	**	-1.33	**	-1.43	**	1.71	**	1.98	**
Nobs	4486	.	4486	.	4486	.	4486	.	4486	.	4486	.	4486	.	4486	.
Rho	0.75	**	0.64	**	0.61	**	0.68	**	0.46	**	0.68	**	0.27	*	0.21	*
(-)LL	4446		4416		4412		4385		4396		4406		4352		4337	
Inter-country variance	40.3		40.2		39.2		30.1		29.7		40.0		12.8		13.8	
I*rel*			0.4		2.9		25.4		26.4		0.7		68.3		65.7	
Maximum deviation	20.3		19.7		19.6		17.3		17.5		19.9		13.3		13.8	
I*abs*			3.0		3.4		15.0		14.0		2.0		34.6		32.1	

Note : * p<5%, ** p<1%

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What are the Motivations of Pathways to Retirement in Europe: Individual, Familial, Professional Situation or Social Protection Systems?

Thierry Debrand (Irdes), Nicolas Sirven (Irdes)

The aim of this research is to identify the determinants of pathways to retirement in Europe and, by measuring the influence or combined influence of individual, contextual and institutional domains on labor force participation, to better understand inter-country variations in the employment rates of older citizens. The dataset consists of both the first two longitudinal waves of SHARE (2004-2006) and some macroeconomic series from the OECD describing three complementary social protection systems (pensions, disability, employment). The analysis is simultaneously carried out in terms of "stocks" (labor force participation in 2004) and "flows" (pathways from employment in 2004 to retirement in 2006). Indicators are developed to measure the contribution of each domain (individual, contextual, institutional), and their various combinations to the employment rate of older citizens, and their role in explaining inter-country differences. As expected, results demonstrate that labor force participation and the decision to retire are determined by the various individual and contextual domains with social protection systems, each playing a significant role. Institutional determinants explain most of the inter-country differences. There appears to be a complementary effect between the different categories of social protection, and the global effect of the three systems combined is greater than the sum of the idiosyncratic effect of each system. Future public policies aiming at increasing the workforce participation of older citizens should therefore take into account that retirement decisions are determined by complex, interactive and individual determinants, and that within the European Union, the main convergence factors are to be found in the differences in social protection systems.

Quelles sont les motivations de départ à la retraite en Europe : situations individuelle, familiale, professionnelle, ou rôle des systèmes de protection sociale ?

Thierry Debrand (Irdes), Nicolas Sirven (Irdes)

L'objectif de cette recherche consiste à appréhender le processus de départ à la retraite des seniors et de mieux comprendre les différences entre les pays européens, au regard des différentes dimensions – individuelle, familiale, professionnelle, et institutionnelle – qui sont susceptibles d'influencer l'offre de travail. Pour cela, nous utilisons les données longitudinales de l'enquête SHARE (2004-2006) complétées par des séries macroéconomiques provenant de l'OCDE et décrivant trois systèmes de protection sociale (emploi, retraite et santé). L'identification des déterminants de l'emploi a été menée simultanément en termes de « stock » (la participation à l'emploi des seniors en 2004) et de « flux » (transition emploi-retraite entre 2004-2006). Des indices permettant de mesurer le rôle des différentes dimensions dans l'explication des différences entre les pays ont ensuite été développés. Les résultats sont de trois ordres : (1) les déterminants de la participation à l'emploi et du passage à la retraite sont nombreux et multi-dimensionnels. (2) Chaque élément de la protection sociale (emploi, retraite et santé) influe sur l'emploi des seniors. Il semble exister une complémentarité entre ces différents systèmes. (3) L'explication des différences entre les pays en ce qui concerne la participation à l'emploi et le passage à la retraite trouve son origine principalement dans les déterminants institutionnels. Dès lors, toute politique publique qui aurait pour but une augmentation du taux d'emploi des seniors devrait reposer sur ces deux postulats : premièrement, elles doivent tenir compte de la complexité des déterminants de la décision des individus et de leurs interactions ; deuxièmement, les principaux facteurs de convergence au sein de l'Europe sont à rechercher dans les différences systémiques

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