Centre d'Estudis Demogràfics

TRANSITIONS TO RETIREMENT IN SPAIN. A STUDY OF THE 1906 TO 1925 COHORTS

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368

PAPERS DE DEMOGRAFIA

2010

UNIVERSITAT AUTÒNOMA DE BARCELONA
08193 Bellaterra (Barcelona)

Centre d'Estudis Demogràfics

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L'estudi fou presentat per Madelín Gómez com a treball de recerca
a la *European Doctoral School of Demography*, Curs 2009-2010.
També al *Nordic Demographic Symposium 2010 Migration*,
organitzat per la Swedish Demographic Association,
a Lund (Suècia), del 17 al 19 de juny de 2010.

Centre d'Estudis Demogràfics

2010

Resum.- *Transició cap a la jubilació a Espanya. Un estudi de les cohorts nascudes entre 1906 i 1925*

L'article analitza la transició de l'ocupació cap a la sortida definitiva del mercat de treball per jubilació. L'objectiu és explorar els determinants sociodemogràfics que provoquen una sortida del mercat laboral, abans dels 65 anys, utilitzant l'Enquesta Sociodemogràfica de 1991. Les cohorts estudiades inclouen els nascuts entre 1906 i 1925, que van aconseguir l'edat oficial de retirar-se, els 65 anys, entre 1971 i 1990. S'utilitzarà el *Mètode d'Anàlisi Històric d'Esdeveniments*-EHA, per distingir l'efecte de variables com el sexe, cohort de naixement, arranjaments familiars, nivell d'instrucció, tipus de contracte i tipus d'ocupació i durada en el mercat de treball sobre la transició a una jubilació avançada.

Paraules clau.- Transició a la jubilació primerenca, *Mètode d'Anàlisi Històric d'Esdeveniments*, Espanya.

Resumen.- *Transición hacia la jubilación en España. Un estudio de las cohortes nacidas entre 1906 y 1925*

El artículo analiza la transición de la ocupación hacia la salida definitiva del mercado de trabajo por retiro. El objetivo es explorar los determinantes socio-demográficos que provocan una salida del mercado laboral antes de los 65 años, utilizando la Encuesta Sociodemográfica de 1991. Las cohortes en estudio incluyen los nacidos entre 1906 y 1925, que alcanzaron la edad de retiro oficial, los 65 años, entre 1971 y 1990. Se usará el *Método de Análisis Histórico de Acontecimientos*-EHA, para distinguir el efecto de variables como el sexo, cohorte de nacimiento, arreglos familiares, nivel de instrucción, tipo de contrato y tipo de ocupación y duración en el mercado de trabajo sobre la transición a una jubilación adelantada, o sea antes de los 65 años.

Palabras clave.- Transición a la jubilación temprana, *Método de Análisis Histórico de Acontecimientos*, España.

Abstract.- *Transitions to retirement in Spain. A study of the 1906 to 1925 cohorts.*

This paper explores the socio-demographic determinants of early retirement decisions. Data from the Socio-demographic Survey carried out in Spain in 1991 will be used. The birth cohorts for this study are made up of individuals born between 1906 and 1925, who fulfilled the 65 year-old legal retirement age between 1971 and 1990. *Event History Analysis Technique* will be used focusing on demographic indicators such as: sex, cohort and family formation, as well as other socio-economic factors such as education level, type of contract, type of occupation and duration in the labor market.

Keywords.- Transition to early retirement, *Event History Analysis Technique*, Spain.

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TRANSITIONS TO RETIREMENT IN SPAIN. A STUDY OF THE 1906 TO 1925 COHORTS

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1.- Introduction

Nowadays receiving a retirement pension is a fundamental right determined by the years spent into the labor market, among other requirements. This basic right in Spain dates back to the beginning of the 20th century, although its consolidation occurred just in the last decades of it.

The legal age for an individual to obtain a full retirement pension is 65 years old for both sexes in Spain although it can be acquired earlier under specific circumstances. A decrease in the mean age of retirement has been observed all around the world (Gruber & Wise, 1999; Gendell, 2001). This fact along with the population aging process, face the challenge to support a pay-as-you-go pension system that has to sustain an increasing number of individuals during longer periods due to the rise in life expectancy.

Labor market balance is determined by labor force supply which depends on population structure, and the labor force demand settled according to the aggregated production function of each economic sector (Díaz & Llorente, 2005).

Population dynamics determine the size of potential labor force supply. Firstly, it determines the number of people that enter into the labor market (besides other factors such as age at entering, educational attainment and skills needed for each job). Secondly, it also affects how many of them leave the labor market. An increase in life expectancy -including a healthier life expectancy- leads to an increasing number of people living until older ages and in better physical condition (Mackenbach, Kunst et al. 1997; Bloom, Canning et al. 2011). Therefore, an increasing number of individuals reach ages 60, 65 and

over, and in better physical conditions, supporting the idea that population can remain active during longer periods.

Current debates and researches regarding active population and social security systems sustainability have focused their attention on these second aspects of labor force supply. Solutions like the attempt to delay the legal age of retirement have been recently discussed in the social and political arena of France, Italy, Spain, among other countries (Díez, 1999; Auer y Fortuny, 2002; Díaz, 2005).

A key factor to this subject is the study of the reasons for people to retire earlier by looking at the determinants that shape early retirement patterns. Several researches have been focused on the economic behavior and health determinants (Bloom et. al., 2007; Meijer et. al. 2008) as well as the impact of retirement programs on earlier retirement (Gruber & Wise, 1999; Stahlberg et. al., 2005). Nevertheless, due to the lack of available longitudinal data, there have been fewer researches on the life course demographic factors influencing the decision to retire, especially in the case of Spain.

The present paper will examine males and females transition from active life to retirement, then, the aim of this paper is then to explore socio-demographic determinants of early retirement decisions. Particularly, we will focus on demographic indicators such as: sex, cohort, educational attainment and family formation, as well as socio-economic factors such as: type of contract, type of occupation and duration in the labor market.

The phenomenon of interest is the relation between socio-demographic variables and transition from active life to retirement. The age at retirement will be modeled using a hazard approach to describe these transitions. The Event History Analysis technique is particularly appropriate for the study, allowing us to deal with constant covariates; set the hazard of leaving the labor market within a small period of time as constant; and taking into account censored observations.

Transition to retirement will be studied using data from the Socio-demographic Survey carried out in Spain in 1991 by the National Institute of Statistics (INE). This is a longitudinal dataset that collects retrospective information from 157,000 individuals. The cohorts for this study are made up of individuals born between 1906 and 1925, who fulfilled the 65 year-old legal retirement age between 1971 and 1990. These were the first cohorts who enjoyed wide pension benefits coverage.

The paper is structured as follows. First, a summary of the history of pension system in Spain is described followed by a review of the principal theories and empirical studies related with the subject. Third, data and methodology used will be explained, including a description of the retirement age model. Fourth, the main results from the models studied will be introduced. Finally, conclusions and references will be presented.

2.- History of the Pension System in Spain

The first mandatory insurance for job-related accidents in Spain (*Ley de Accidentes de Trabajo*) was introduced in 1900, covering public employees only. Later on, other pension funds were created for private sectors until 1919, when mandatory retirement insurance was introduced for private-sector employees.

The first model of general social security was established in 1963, with the Social Security Law (*Ley de Bases de la Seguridad Social*), whose objectives were to unify and integrate the financial basis distribution, management and state participation in financing. In this reform a large number of special funds (*regímenes especiales*) with special treatments to different sectors or occupational categories were also created. Subsequently, the General Law of Social Security, published in December 1966, stated in articles 27 and 28 the beneficiaries of retirement schemes and the amount to be paid.

After several modifications in the mechanism, a major reform was introduced in 1979 unifying the whole system under the National Social Security Institute and harmonizing criteria's and benefits, which leads to a reduction of the differences among special funds and general funds.

In 1985, another major reform took place, modifying some factors such as: the tax bases (bases de cotización) were adjusted to actual wages; pensions were indexed to the cost of living; the minimum number of years of contribution necessary for a retirement pension and for calculating the amount of money to receive was increased and special funds and the Social Security System structure in general were reduced.

3.- Theoretical and empirical review

Transition to retirement is highly influenced by the age and sex of the individual (Kalleberg & Sorensen, 1979). According to the Spanish law, every worker affiliated to the Social Security System is eligible for a retirement pension when she/he has turned 65 years old. Nevertheless, pension benefits could be claimed when a person is 55 years old, under exceptional circumstances.

The mean *age* of exit from the labor market has declined over time, in particular in industrialized countries (Gruber & Wise, 1999; Gendell, 2001; Auer & Fortuny, 2002; Dittrich, Büsch et al. 2011). In contrast, Quinn (1999) has shown a reverse trend in the pattern, with an increase of the age at retirement in the United States since 1985.

In the case of Spain, pre-retirement schemes were frequently used during the eighties and nineties as a result of the industrial restructuration faced by the Spanish economy, which compelled low skilled workers and workers from some specific sectors (like agriculture and fishery) to leave the labor market before the age of 65 (Díez, 1999, Miret et. al., 2008).

An element related to age is the *labor market experience*. In this regard, Antón et. al. (2007) observed that in general those who retired earlier had remained more years in the labor market. Moreover, people who are in the highest levels of the occupational category scale (like white collars, academics, physicians etc.) remain more years in the labor market.

Regarding *sex*, several studies have found that women's participation in the labor market differs from men's participation (Reitzes, Mutran et al. 1998; Garrido, 2004). The first ones have less participation in the labor market, lower wages, less job security and benefits; therefore, they are more likely to leave the labor market to family care, thus decreasing the opportunities to fulfil the requirements for a full retirement pension (Even y Macpherson, 1984; Flippen & Tienda, 2000; Baizán et. al., 2001). Another study by Wolfinger et. al. (2009) examined the academic retirement process in the United States and found that there are no significant differences among faculty members regarding the relation between risk of retirement and sex.

Historically, in Spain women had had a lower rate of participation in the labor market, given the traditional role of women, responding to the house work and family care (Reitzes et al., 1998; Garrido & Chuliá, 2005). However, this trend has recently changed (from the

eighties and nineties onwards), but does not affect the cohorts in our study, who have been excluded from productive areas, especially at their reproductive ages. As a result, few of them have been able to accumulate the minimum years needed to apply for a retirement pension.

Several papers have dealt with the issue of *family arrangement* in relation to retirement decisions. On the one hand, it has been observed that married individuals retire earlier than unmarried ones (Tompa, 1999; Wolfinger et. al., 2009). Other studies have observed that married women are more likely to leave the labor market to devote themselves to housework and reproduction, which leads them to spend fewer years in the labor market, thus are less likely to receive a retirement pension (Stahlberg et. al., 2005). On the other hand, if a person is married, the decision to retire is influenced by the retirement decision of the partner; particularly observed for women (Skirbol & Silverman, 1992; Ruhm, 1996).

Other factors influencing the retirement decision are *family size*, an even better predictor if the person has dependent children to support. The bigger the family size (or more dependent children), the lower the probability to withdraw from the labor market (Tompa, 1999; Wolfinger et. al., 2009).

The effect of *education attainment* on retirement decision has been also documented. Human Capital Theory suggests that an investment in education, which is translated into more years of education, is expected to be compensated with higher wages. Higher wages lead to greater attachment to the labor market. In this direction, for the Spanish case, Garrido (1996) shows evidence where those individuals with higher educational attainment remain more years in the labor market. On the contrary, a study comparing Germany and the United Kingdom retirement found no relationship in this regard, with the exception of German males with higher education, who postponed their retirement (Oswald, 1999).

The retirement decision is also related to how individuals are inserted into the labor market. In this sense, *occupational category* can be used as a proxy of perceived income. The higher the position someone reaches in the occupational scale, the lower his/her risk of exit the labor market. Moreover, it has been observed by Casey & Wood (1994) that in the United Kingdom early retirement has been commonly used in large industries, manufacturing organizations and public sector, rather than in small businesses. In the same strand, the *type of contract* affects the retirement pattern. A temporal contract (or part-time

job) offers lower job security than a permanent contract (or full-time job), especially in periods of economic crisis, increasing the probability of leaving the labor market.

4.- Data and definitions

The Socio-demographic Survey of 1991, held by the National Institute of Statistics of Spain (INE), is so far the only longitudinal survey at national level that gathers retrospective information in a wide range of vital events, including family formation, household arrangements, education and labor activity.

The survey includes 157,000 individuals who had 10 years old or older by the time of the interview. The section of Activity collects information concerning labor history, where up to four periods of activity have been recorded for each person. This period of activity responds to one of the following labors status: is an employee or is actively searching for a job, without interruptions or with interruptions of less than a year.

Information is recorded on yearly basis, so the age at entry and exit from the labor market are known, as well as the reasons to exit. In each period, an individual could experience a job change and/or an occupational category change; therefore, the main occupation for the whole period is taken. Other socio-demographic indicators such as living with partners or living with children are also documented on yearly basis.

Given that the research goal is to analyze early retirement patterns, the model is limited to those who by 1991 -which is the year of the survey- had retired between the age 59 and up to 65 years old, and entered at least once into the labor market. In order to overcome attrition effects, individuals were grouped in five birth-cohort groups. Cohorts were made up of individuals born between 1906 and 1925. The final sample size of individuals at risk of entering into a retirement pension is then 24,403 individuals.

5.- Method and model specifications

The study is intended to explore the relation between some characteristics of the individuals and their transition to early retirement. For this purpose, the transition from

labor force to retirement is modeled using the Event History Analysis technique. Then, permanence in the labor market until retirement will be modeled using the hazard model specification.

The Event History Analysis technique is particularly appropriate for this study, and it has been already used for retirement researches (Tompa, 1999). The hazard of leaving the labor market within a small period of time is set as constant (within a year) and censoring observations are taken into account.

Our longitudinal dataset register the information on yearly basis. Having a large amount of information covering short periods, the data set can be used in a continuous framework. Since the effect of time in the transition to retirement is neither constant nor monotonic (it shows two important peaks at ages 60 and 65), a piece-wise constant exponential model is more appropriate, where the baseline across periods is a step function with constant hazard (exponential) within each period.

This methodology allows us to evaluate the effect of change in the independent variables (sex, cohort, children, marital status, education, occupation and duration in activity) on the probability of change in the dependent variable (transition to retirement).

We will focus our attention in early retirement; therefore transition to retirement is divided before and after age of 65. Those who retired later than the age of 75; or who had not retired by the year of the survey (1991); or exited the labor market for other causes are treated as censored observations.

Model specifications

The baseline is described through a set of dichotomous variables for each age. All individuals start being at risk of exiting the labor market at the same age, at 59 years old. Since retirement hazards are almost insignificant before the age of 60 -as shown in the next section- and our interest is on early retirement (before 65 years old), the baseline hazard is split into the following cut points: 59; 60; 61; 62; 63; 64; 65; 66 and 75.

Then the model describes if the individuals had higher or lower hazard of leaving the labor market for retirement, according to some demographic and socio-economic characteristics. Some relevant interactions between covariates were considered, but they were not significant, hence they are not shown in the paper.

Marital status influences the retirement decision. It is frequent that couples make the retirement decision jointly. Therefore, it is expected that if a person's spouse is retired, that person is more likely to retire as well. Moreover, unmarried individuals are more likely to place higher value on the work environment and work-related networks than on family ties; thus, unmarried people are less likely to retire at each age than married individuals. In spite of the fact that in the dataset the retirement information of the partners does not appear, if the person if living with a partner is taken as a proxy. Therefore, individuals living with their partners are expected to be more likely to retire earlier than single individuals.

Family arrangements are expected to have an influence on retirement decision; for instance living with dependent relatives will decrease the risk of earlier retirement, except in the case of women who are more likely to leave the labor market to take care of their relatives, as observed in previous studies. Consequently, it will be taken into account if the person lives with dependent children (up to 16 years old), and if the person lives with his/her parents.

Educational attainment will be described in 8 categories: No education; Less than primary; Primary School; Elementary school; High school; Vocational courses, Diplomatura and Bachelor (university degree). It is expected that higher education will lead to postponement of retirement towards older ages.

It is assumed that occupational variables will work in the same direction of education. Accordingly, the higher an occupational category a person reaches the older the person retires. Occupational categories used in this model in descending order of significance are grouped as: Professionals and technicians; High-level workers (service/construction/ industry); Administrative, technicians, and others workers; Low-level service; Agricultural and fishery workers; Construction and industry workers; Non-skill occupations and the Army (which has a specific retirement regime). Type of contract is measured as full-time or part-time job. It is expected that part-time jobs represent a higher hazard of retirement.

6.- Results

6.1.- Description of the population under analysis

Since not all individuals on the survey are exposed to the event of interest, a description of the sample according to their relation to the labor market is presented in Table 1. From the total sample, those belonging to the cohort of study were first selected. Another selection was made depending on their relation with the labor market. Those who never entered into the labor market were discounted, which led to a final sub-sample of 24.403 people at risk of retirement.

Table 1.- Data from the Sociodemographic Survey, Sample Selection

	Male	**Female**	**Total**
Total Sample of the Survey	73,985	83,115	157,100
Birth cohorts in the study (1906-1925)	12,265	18,993	31,258
Periods of entering in activity			
At least 1	3,554	11,080	14,634
At least 2	8,336	1,019	9,355
At least 3	333	62	395
At least 4	13	6	19
Never work	29	6,826	6,855
At least once in the labor market	**12,236**	**12,167**	**24,403**

Source: Encuesta Sociodemográfica, 1991 (INE).

As it was reflected in the literature review, women in general and in particular in Spain have a lower rate of participation in the labor market compared to men. This feature is revealed also in the dataset. From the total sample of individuals under study in the selected cohorts, 6.826 women never entered into the labor market, in contrast only 29 males never work.

Nevertheless, although women of these cohorts have lower participation in the labor market, the sample shows similar figures for both females and males (Table 2). This reflects women's higher survival. Even when females enter into the labor market at lower

proportion than males they live longer, and therefore their sample is larger. It can also be observed the attrition effect for both sexes; the older the cohort in the study, the lower the sample size.

Table 2.- Individuals at risk of retirement by sex and birth-cohort

Cohort	Male	Female	Total
1906-1910	1,4	1,6	3,0
1911-1915	2,4	2,8	5,3
1916-1920	3,3	3,5	6,9
1921-1925	4,9	4,1	9,0
Total	**12,2**	**12,1**	**24,4**

Source: Encuesta Sociodemográfica, 1991 (INE).

As was previously mentioned, each individual has multiple records of entries and exits from the labor market (up to four times were recorded in the survey), but here the transition of interest is their permanent exit in the last period of activity when the person retires. In the case of Spain, there are only two permanent causes of exit preventing individuals from returning to the labor market: retirement and permanent disability.

Table 3 shows the causes of exits recorded in our dataset. Only the first two are permanent causes, which reflect a lower proportion of females that are eligible for retirement pension compared to males, 39% and 79% respectively. The second column for each sex represents the exits of individuals who are over 55 years old. It indicates that almost all retirements occur after that age, which is the minimum legal age at which an individual can apply for a retirement pension.

It is noteworthy that the sample shows the higher number of exits that females has due to housework or family reasons, supporting previous studies where the historic females role of family and household care is described.

Table 4 depicts the individuals' last occupational category by the time of retirement. It can be observed that most of the retirees are concentrated in lower skill occupations, such as agriculture and construction. In addition, there are fewer females than males in all professional occupations, except in the highest level (Professionals and technicians), where they have comparable magnitudes.

Table 3.- Number of people by sex and cause of exit from the labor market

	Females		Males	
Cause of exit	**Exit**	**exit>55**	**exit**	**exit>55**
Permanent exit				
Retirement	4.753 (39%)	4.588 (38%)	9.662 (79%)	9.351 (76%)
Disability	1.563	1.033	1.720	1.226
Temporal exit				
Unemployment	411	139	241	112
Military Service			8.216	
Housework/Family reasons	5.674	427	24	2
Study	16		20	1
No need to work	189	52	12	4
Others	244	68	584	32
Individuals at risk	**12.167**		**12.236**	

Source: Encuesta Sociodemográfica, 1991 (INE).

Table 4.- Number of retirees by last occupation category and sex

Type of Occupation	**Male**	**Female**
Professionals and technicians	2	2
High-level workers (service/construction/industry)	1,1	3
Administ, technicians, and others	7	2
Low-level service occupations	8	1,4
Agricultural and fishery workers	2,5	1,1
Construction and industry workers	2,3	6
Non-skill occupations	1,6	6
Military Force	2	
Total	**9,6**	**4,7**

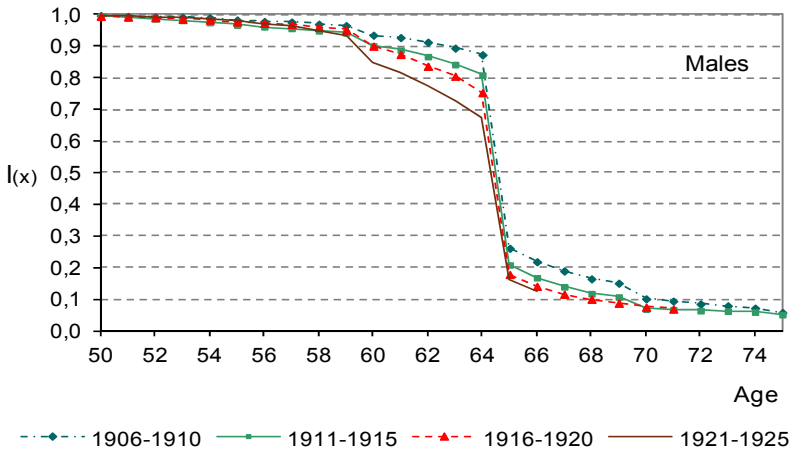
Source: Encuesta Sociodemográfica, 1991 (INE).

6.2.- Transition to retirement. Comparison among cohorts

In order to examine retirement patterns, firstly the survival curves of activity by sex and birth cohorts will be shown; secondly, hazard rates of retirement between the ages of 50 and 67 will be presented.

Figure 1 depicts male's cohort survival in the labor market. At age 50, almost all males were in the labor market, afterwards, a steady decrease in the number of survivors is observed, with a pronounce decline after age 60, and followed by an abrupt fall in the number of survivors at the age of 65.

Figure 1.- Males' survival curve in activity, by birth cohort



Source: Encuesta Sociodemográfica, 1991 (INE).

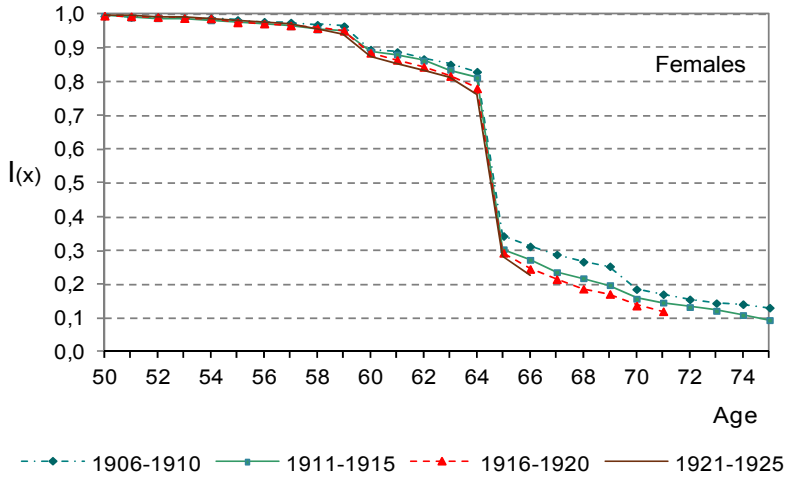
Before the age of 65, each younger generation has a lower proportion of survivors at each age, which means that early retirement among males has increased. For instance, at the age of 64, the first cohort (1906-1910) has 87% of active individuals (13% out of the labor force); while in the last cohort (1921-1925) the active population has decline, increasing the individuals already retired at this age up to 33%.

At the age of 65, most individuals retire. Notice that in the first cohort, 74% of them are already retired, and in the last cohort this figure increases up to 84%. After this age, there is a slowing down on the pace of retirement up to the age of 70, when there is practically any retirement. Also should be notice that by the age of 75; about 5% of the individuals are still in the labor market.

Regarding females, start at age 50 with similar behavior as in the case of males until the age of 60. After that, females' behavior reveals some differences (Figure 2). The decline of survivors (in the labor market) between ages 61 and 64 follows a similar pattern for all

cohorts, but with a 5% difference between them (in the case of males there is a 20% of differences among cohorts for the same ages).

Figure 2.- Females' survival curve in activity, by birth cohort



Source: Encuesta Sociodemográfica, 1991 (INE).

From age of 65 onwards, females' pattern is similar to that of males', but on a different scale. At age of 65, there are fewer females than males leaving the labor market with a retirement pension– 72% females and 84% males in the last cohort- following a similar trend after age 66. This could be explain by the fact that although a lower proportion of women get a retirement pension, those who finally get it, has to spend more years working (given a short labor history).

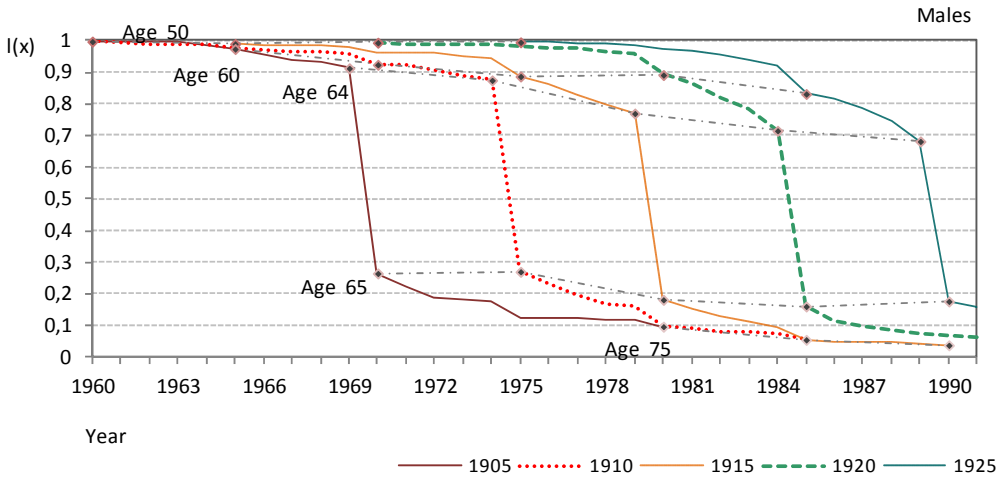
A different approach to the same phenomenon can be observed using the survival curves in activity plotted according to the years in which retirement event occurs. Figure 3 shows males' survival in each single cohort[1], but also - in dash black lines- the age of retirement (50; 60; 64; 65 and 75). For instance, the 1905 cohort shows a 10 % of retired individuals at the age of 64, and their retirement occurs in 1969; while the 1910 cohort shows a 13 % of retired individuals at the age of 64, but their retirement occurs 5 years later, in 1974.

According to the figures for males, early retirement starts increasing at the end of the seventies. Increments in early retirement were first observed at the age of 64 in the period

[1] For visual purposes only four cohorts are depicted in Figures 3 and 4.

from 1974 to 1989, while the increase in early retirement at the age of 60 was seen later in time, from 1985 to 1989.

Figure 3.- Males' survival curve in activity, by year of retirement and birth cohort



Source: Encuesta Sociodemográfica, 1991 (INE).

Retirement at the age of 65 experiences a transition from nearly 70% of inactive individuals in the first two cohorts to a steady increase of retirement at this age between the 1910-1915 cohorts (occurring in the 1975-1980 period); and there is a similar proportion for the rest of the cohorts, with over 80% of the individuals already retired at this age.

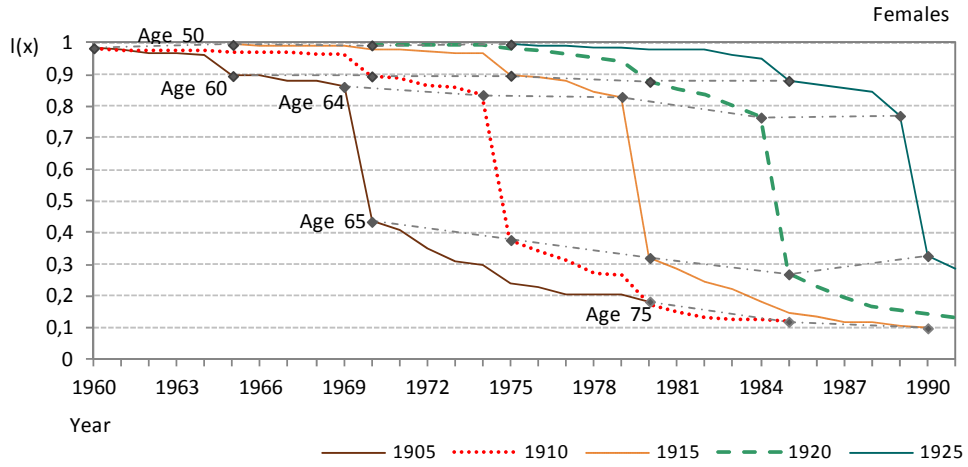
Figure 4 shows females' behavior. Unlike what males experience at age 60, females show only slightly increases in the retirement over time. Early retirement at the age of 64 increases from 1979 to 1984, then it stabilizes again with around 7% fewer active individuals for the last two cohorts.

At the age of 65, females evidence a decline in the percentage of survivors; indicating an increase in the proportion of women receiving a retirement pension (beginning of the seventies and mid eighties) however, a shift in the trend can be observed for the last cohort, showing a decrease of retirement at age 65 corresponding with the beginning of the nineties.

Figure 5 depicts the conditional probability of experiencing retirement by sex and cohort given that the person has not experienced it before. The expected peak at age 65 was

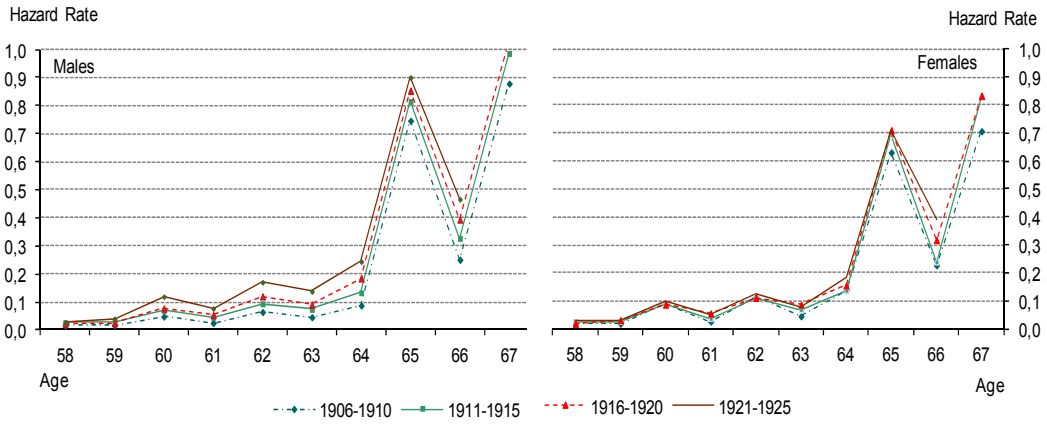
found; in addition, it is observed before that age the effect of the early transition after age 58, although with two peaks at age 60 and 62. Although the probability is relatively low, it increases the younger the cohorts are, especially in the case of males; in the case of females, the change is almost insignificant. At the age of 65, the expected sharp rise is observed, being higher for males than for females. After that age, a small number of individuals are still in the labor market, thus the hazard varies front that age onwards.

Figure 4.- Females' survival curve in activity, by year of retirement and birth cohort



Source: Encuesta Sociodemográfica, 1991 (INE).

Figure 5.- Hazard of retirement by sex and cohort



Source: Encuesta Sociodemográfica, 1991 (INE).

6.3.- Determinants of the earlier retirement

After showing the characteristics by sex, cohort and age of the population exposed to retirement, this section deals with the relation between retirement age and different socio-economic variables, using a multivariate analysis. Given that the model shows the individuals' permanence in the labor market from the age of 59 until their retirement, the hazard ratio evidences if the person with a specific characteristic retires sooner or later compared to the reference category. The model includes demographic and socio-economic variables, which for clarification purposes are shown separately (Table 5, 6 and 7).

Table 5 shows the baseline age at retirement for the model with all the variables. The baseline delineates the hazard of retirement at each age. Notice that there is a peak of the hazard: the first one at age 60, then a gradually increased until the other peak at age 65. For instances, males at age 65 are five times more likely to leave the labor market than to remain in it. Respect with the two preretirement peaks previously observed (at 60 and 62), only age 60 seems to be of higher relevance, when including other factors.

Table 5.- Labor force withdrawal due to retirement (PW Model)

		Females		Males	
Variable		**Haz. Ratio**	**Signif.**	**Haz. Ratio**	**Signif.**
Baseline age	60	0.14	***	0.41	***
	61	0.04	***	0.17	***
	62	0.05	***	0.26	***
	63	0.06	***	0.28	***
	64	0.09	***	0.39	***
	65	1.32		5.23	***
	66	0.33	***	1.70	***
	75	0.30	***	1.44	***
N		5,887		10,506	
N who experience the event		4,354		8,912	
Overall P		0.00		0.00	

*p<0.1, **p<0.05, ***p<0.01

(PW) Piecewise exponential hazard model on the risk of exit to retirement is used.

Source: Encuesta Sociodemográfica, 1991 (INE).

The association of retirement with socio-demographic variables is shown in table 6. Concerning the birth cohorts, the last two females' cohorts are significantly different from the reference category, which means for instance that 1921-1925 cohort retires a 14 % earlier than the 1906-1910 cohort. In the case of males, only the last generation retires earlier, 18% sooner than the reference.

Table 6.- Labor force withdrawal due to retirement (PW Model). Continued from Table 5

		Females		Males	
Variable		**Haz. Ratio**	**Signif.**	**Haz. Ratio**	**Signif.**
Cohort	1911-1915	1.04		0.99	
Ref. cat. (1906-1910)	1916-1920	1.10	**	1.00	
	1921-1925	1.14	***	1.18	***
Education	< primary	0.97		1.03	
Ref cat (No Schooling)	Primary School	0.96		0.93	***
	Elementary School	0.77		0.76	***
	High School	0.82		1.18	
	Vocational Courses	0.78		0.78	***
	Diplomatura	0.74		0.78	***
	Bachelor	0.91		0.50	***
Livivng with children					
Ref. cat. (0 child)	Yes	0.91	***	0.99	
Livivng with children<16					
Ref. cat. (0 child)	Yes	2.51	***	1.47	***
Living with partner					
Ref. cat. (no)	Yes	1.20	***	1.13	***
Living with parents					
Ref. cat. (no)	Yes	1.31	***	1.09	
N		5,887		10,506	
N who experience the event		4354		8912	
Overall p		0.00		0.00	

*p<0.1, **p<0.05, ***p<0.01

(PW) Piecewise exponential hazard model on the risk of exit to retirement is used.

Source: Encuesta Sociodemográfica, 1991 (INE).

Regarding education, for females it was found no association, which means that there is no particular behavior regarding education level in women's retirement pattern. In the case of males, the increase in educational attainment is associated with a delay in the retirement

age, decreasing twice the hazard of exit from activity of those with university degree (bachelor) compared with those with no schooling.

With respect to family arrangement, the table shows that in the case of females, living with children delays the retirement age. However, if the children are less than 16 years old (in consequence they are not able to work) the hazard increase by two times; therefore, they retire sooner. In the case of males, living with children has an influence on early retirement risk only if the children are up to 16 years old.

According to the literature review, living with a partner is an important predictor. We have found this effect in our study, with an increase in the retirement hazard being higher for females. Nonetheless, living with parents was only influential in the case of females getting ahead their retirement age.

Labor conditions are analyzed in table 7 for each sex.

Table 7.- Labor force withdrawal due to retirement (PW Model). Continue from Table 6

	Females		Males	
Variable	**Haz. Ratio**	**Signif**	**Haz. Ratio**	**Signif.**
Type of work ref. cat. (Full-time)				
Part-time	0.75	***	0.75	***
Labor force experience	0.98	***	0.95	***
Occupational Cat. ref. cat. (Professionals and technicians)				
High-level (service/construction/industry)	0.78		1.35	***
Low-level service occupations	1.10		1.43	***
Agricultural and fishery workers	0.90		1.38	***
Administ, technicians, and others	0.90		1.40	***
Construction and industry workers	1.14		1.63	***
Non-skill occupations	1.07		1.67	***
Military Force	0.59		1.59	***
N	5,887		10,506	
N who experience the event	4,354		8,912	
Overall p	0.00		0.00	

*p<0.1, **p<0.05, ***p<0.01

(PW) Piecewise exponential hazard model on the risk of exit to retirement is used.

Source: Encuesta Sociodemográfica, 1991 (INE).

Have part-time job delays the retirement age compared with having a full-time job for both sexes. Duration in the labor market (labor force experience) also exerts influence on the retirement time –each year a person remains in the labor market increases the retirement age. Regarding occupational category, only males have a significant association, those in the highest levels retire later than the rest. Meanwhile, those in the lowest levels, like non-skill, construction and industry occupations, retire sooner.

7.- Conclusions

The aim of this study has been to examine the pattern of retirement in Spain, looking for the association of socio-demographic variables with the retirement process. This research has found association of sex, educational attainment, family arrangement, occupational category and cohort with the risk of early retirement. The results reflect that early retirement is important for both sexes, and is increasing over time. Women are more affected by their family context than males. On the contrary, males are more affected by their educational attainment and employment status.

The findings support previous studies where a strong relationship between retirement and family ties was found. This is true especially for women; those who were living with dependent children ran twice the risk of earlier retirement. In the case of males, this effect is also observed, but with a lower incidence. The same was observed analyzing living arrangement. Living with parents or a partner increases the risk of earlier retirement in the case of women; however, in the case of men, only the partner has an influence on their decision to retire.

When analyzing job characteristics and educational attainment in the case of males, there is evidence that the highest level of the scales for these variables is strongly associated with a retirement age delaying. For females, neither the occupational category nor the educational attainment seems to be an important predictor of their retirement pattern.

Summing up, this study shows that retirement patterns are strongly different regarding gender. Spanish females belonging to the cohorts that were eligible for a retirement pension in the 1970s and 1980s didn't count with prolonged labor histories that allow them to generalize retirement pensions. Despite that, for those eligible for retirement, family arrangements are important for explaining their behavior. As regards males, their

retirement decisions are strongly associated with variables related to labor context and educational assets. In addition, but being less significant element, living with dependent children and with a partner increases the risk of an early retirement.

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