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# Retirement Decisions in Recessional Times: Evidence from Spain

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## Abstract:

The recession that started in the United States in December 2007 has had a significant impact on the Spanish economy through a large increase of the unemployment rate and the bursting of the housing and financial bubbles. We explore how the crisis and changes in the labor, housing, and financial markets might have impacted retirement patterns of Spanish men and women nearing retirement age. We find that the recession primarily reduced women's retirement likelihood by 27%. The effect, which was associated with the labor market deterioration, as captured by higher unemployment rates, was circumscribed to women already at work, who chose to stay at work longer. In contrast, for the most part, men's retirement likelihood did not change with the labor, housing, and financial market fluctuations. Overall, the findings suggest that working women might have prolonged their working lives to make up for lost household income.

**Keywords:** retirement, recession, unemployment, housing market, stock market

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## 1. Introduction

The economic downturn that started with the so-called Great Recession in the United States in December 2007 has had a significant impact on the Spanish economy. Unemployment rose to an average that exceeded 25% and, for some groups, such as younger workers, that figure hovered around 50%. In addition, the bursting of the housing bubble and the sharp decline of the stock market may have severely impacted the accumulated wealth of many Spanish households. As a result, retirement behavior may have been affected by the ongoing changes in the labor, housing, and financial markets. On one hand, worse job prospects in the labor market may have generated a discouraged worker effect whereby older employed and unemployed workers may have decided to withdraw from the labor force and retire. On the other hand, job and wealth losses following the deterioration of the labor market, along with large reductions in asset prices, may have encouraged some workers to delay retirement in order to make up for lost income, rebuild savings, and regain their desired standard of living for their retirement years.

In this paper, we explore whether the recession impacted the retirement patterns of Spaniards nearing retirement age and, if so, how. Subsequently, we take a close look at the role that fluctuations in the labor, housing, and financial markets during the recession might have had on Spaniards' retirement decisions. To achieve our goals, we rely on data from the Spanish Labor Force Survey spanning from 2002 to 2013, to which we merge aggregate data on stock, housing, and labor market trends. In particular, we exploit the yearly variation in the IBEX35 – a stock price index – to proxy for changes in financial wealth, yearly variation in housing prices across the 50 Spanish provinces from the *Ministerio de Fomento* (or Ministry of Public Works) to capture changes in housing wealth and yearly variation in province-level unemployment rates from the Spanish Labor Force Survey to reflect the worsening of labor market conditions.

An extensive literature has examined how recessions impact retirement decisions. Most of this literature has centered on the United States. Some authors focus on the possibility that households *accelerate* their retirement plans due to ongoing job cuts. In that vein, Coile and Levine (Coile and Levine and Coile and Levine) find that unfavorable labor market conditions induced earlier retirements for those aged 62 and above using 30 years of *Current Population Survey* data, the 2000 *Census* and subsequent *American Community Survey* data. Similarly, Bosworth (2012), focusing on the Great Recession, concludes that the impact of labor market conditions on

retirement decisions is greater than that of household wealth when working with data from the *Panel Study of Income Dynamics*. In addition, focusing in the United Kingdom, Disney, Ratcliffe, and Smith (2015) find that a worsening of labor market conditions is also associated with earlier retirement using data from the 1991–2008 *British Household Panel Survey*.

Yet, other authors argue that older individuals may have *delayed* retirement due to the impact of the downturn on financial asset values (in KEOGH plans and other retirement assets and plans) and housing worth. Indeed, Goda, Shoven, and Slavov (2011) and Goda, Shoven, and Slavov (2012) find statistically significant delays in self-reported assessments of planned retirement and increases in the expected retirement age using the 2006 and 2008 waves of the *Health and Retirement Study* (HRS). A similar conclusion is reached by Amuedo-Dorantes and Pozo (2015), for both immigrants and natives, using the HRS. Likewise, McFall (2011) reports delays in retirement plans using data from the *Cognitive Economics* study.

In contrast with the previous analyses, Crawford (2013) finds *no evidence* of a financial market wealth effect on retirement plans in the United Kingdom using the 2006–2009 *English Longitudinal Study of Ageing*. Likewise, focusing in the United States, Gustman, Steinmeier, and Tabatabai (2011) fail to find much evidence of a retirement delay as a result of the Great Recession when using data on the Early Boomer cohort from the HRS. They argue that, while unemployment increased, the increase was not mirrored in the rate of flow out of full-time work or partial retirement. In sum, studies covering the impact of the recession on older households arrive to a variety of conclusions.

Using, instead, macroeconomic data on 20 OECD countries, Burtless and Bosworth (2013) examine the impact of the recent downturn on labor participation trends of the old-age population. They conclude that the recession did not reverse the trend toward higher old-age labor participation rates, except for a handful of countries that experienced unusually severe downturns, i. e. Italy, Greece, and Ireland. Notably, Spain was not among those countries despite having been severely impacted by the recession.

While informative, the aforementioned studies fail to provide a good picture of how Spanish households have been impacted by the most recent economic downturn. Some do not look at individual households, or at the differential role played by fluctuations in the labor, stock, and real estate markets, such as Burtless and Bosworth (2013). Others focus on the impacts of the Great Recession on dismissal costs and employment protection (Bentolila et al. 2012), poverty rates (Ayala, Cantó & Rodríguez 2011) or earnings inequality (Bonhomme and Hospido 2016). Although these issues are clearly of great relevance, there has been no differentiated analysis for older households and their retirement decisions. In addition, yet, the Spanish case is particularly important in this respect for a couple of reasons. First, the recent economic crisis has had some distinctive features. To start with, unemployment rates increased drastically from 8% in 2007 to a spectacular 26% in 2013.<sup>1</sup> In contrast, the housing market showed moderate changes. Average rates of return to housing assets, which fluctuated around 10% between 2002 and 2007, only became negative (reaching –5%) from 2008 onward. The stock market, however, followed international trends. Its rates of return fluctuated between 25% and –40% as in the United States (see Figure 3 in Appendix). *Second*, because of an aging population, the financial stability of the Spanish pension system is tenuous (Sanchez-Martin and Sanchez-Marcos 2010). Other things equal, higher unemployment rates, coupled with the potential early retirement of eligible individuals who either became unemployed or endured worse working conditions, could have only helped aggravate the ratio of contributors to beneficiaries. Was that the case? Did shocks to the housing and financial markets somehow also contribute to individuals' retirement decisions? And, if they did, what role did they play and how much did they impact retirement planning? Overall, what lessons can be learned for Spain as well as for similar southern European countries with structurally high unemployment rates, relatively resilient housing markets and financial markets that followed international trends?<sup>2</sup>

Gaining a better understanding of how mature Spanish men's and women's retirement decisions changed over the past economic downturn and, in particular, how they responded to fluctuations in the labor, housing, and financial markets, can shed some light on how individuals nearing retirement age might alter their labor market participation decisions in order to cope with recessionary periods. As such, the analysis herein can inform about worrisome labor force participation patterns that may warrant further policy attention in order to address immediate fiscal burdens. In addition, by looking at the role played by fluctuations in the labor, housing, and financial markets, we are able to pinpoint the key determinants of near retirees' labor force participation decisions during economic downturns.

## 2. Institutional Framework

The Spanish Public Pension System is based on a pay-as-you-go scheme that provides earnings-related benefits (Whitehouse 2007). Eligibility and benefits depend both on age and years of contribution. The self-employed,

agricultural workers and domestic workers all face special schemes.<sup>3</sup> Pensions, both in the special and general schemes, are subject to a ceiling that has increased in absolute terms but remained fairly constant relative to average earnings at about 1.6 times the monthly average pay over the decade (Boldrin and Jiménez-Martín 2007). There is also a minimum pension that has increased steadily over the same period and amounts to approximately 30% of monthly average earnings. The average net pension replacement rate is 80%. In what follows, we briefly describe the system as it was at the beginning of 2000, to subsequently comment on the main reforms since.

In 2000, entitlement for an old-age pension required, at least, having paid a minimum of 15 years into the system. The retirement pension amount depended on age, years contributing to the system, and average gross labor earnings during the last 12 working years. The exact amount was given by a base sum that increased gradually with the number of years the worker had paid into the system up to a maximum of 35 years. Normal retirement age was 65. However, early retirement was permitted with a penalty, which depended on the number of years one had contributed to the system after age 60.

With the 1997 reform, the average gross labor earnings used to compute the retirement pension changed gradually every year until referring to the past 15 working years by 2003. In addition, the 2002 reform made early retirement (at age 61) available for unemployed workers who had contributed, at least, for 30 years.<sup>4</sup> It also created incentives for partial retirements, as it made possible combining the retirement pension with some work. The next reform took place in 2007. It reduced the penalties applied to early retirees and further increased the incentives for partial retirement. In contrast, the latest reform of 2011 gradually increased the normal age of retirement from 65 to 67 and the number of years over which gross labor earnings were to be averaged to compute the retirement pension from 15 to 25 years, with both changes taking place from 2013 onward (García-Gómez and Jiménez-Martín 2016).<sup>5</sup>

In addition to the public pension scheme, two other public programs are available for old age workers: unemployment benefits and disability benefits (Boldrin & Jiménez-Martín 2007; García-Pérez, Jiménez-Martín & Sánchez-Martín 2013). In Spain, unemployment benefits that amount to somewhere between 60% and 70% of the most recent gross labor earnings are available for those who have contributed to the social security system for a maximum of 2 years. Individuals who exhaust their unemployment benefits have two continuation programs, depending on their age. One is for those over 45, which is inherently temporary. The other one is for individuals over 52 who satisfy all the requirements for an old-age pension, except for age. This second continuation program can last until retirement. Disability benefits, not based on age or years of contribution, are typically more generous than other old-age programs, reaching about 70% of average wages. Nonetheless, as pointed out by Boldrin and Jiménez-Martín (2007), they have been harder to obtain since the early 1990s.

### 3. Data and Descriptive Statistics

Our analysis primarily relies on the information gathered from the second quarters of the Spanish Labor Force Survey (*Encuesta de Población Activa – EPA*) for the 2002–2013 period.<sup>6</sup> As the national labor force survey, the EPA is ideal to examine trends in the stock and flow of retirees for various reasons. First, it provides nationally representative data on the labor market over an extended period of time, allowing us to explore the impact of the recession and of changes in the labor, housing, and stock markets on retirement patterns. Second, the EPA provides us with detailed information on respondents' demographic traits and on their households' composition and characteristics, including marital status, household size and composition, number of adults working in the household, and partners' labor force status. Those characteristics have proven crucial in explaining retirement decisions; especially in the case of couples who time their retirements to enjoy leisure time together (e. g. Gustman & Steinmeier 2004; Hospido & Zamarro 2014). Household traits are also likely to shape retirement decisions during a downturn given the role of household size and composition, as well as household members' labor force status, in defining economic need and, therefore, retirement plans.

Alternative datasets used in the retirement literature in Spain include the Survey of Health, Aging and Retirement in Europe (SHARE) (e. g. Hospido and Zamarro 2014), as well as the Muestra Continua de Vidas Laborales (MCVL) (e. g. García-Pérez, Jiménez-Martín & Sánchez-Martín 2013; Vegas-Sanchez et al. 2013). Like all datasets, these have their pros and cons. For example, despite its longitudinal nature and suitability for multi-country level analyses, the SHARE is not ideal for individual country level analyses like ours. The information on Spain is limited to about 1,200 observations in just three waves, rendering any analysis of retirement patterns over time rather difficult and nonrepresentative. Similarly, while the MCVL has the advantage of containing the complete work histories of individuals, it lacks information on many of the individual and household characteristics crucial for understanding retirement decisions, such as marital status, education, household size and composition, or the proportion of employed adults in the household. These elements are logically decisive in

shaping individuals' retirement decisions. Finally, an alternative possibility would be to use the longitudinal Spanish Survey of Household Finances (*Encuesta Financiera a las Familias*, EFF), which contains information on the labor force status of individuals, their demographic traits, as well as their financial and housing wealth. Unfortunately, because of confidentiality reasons, the EFF is not released with the geographic detail needed for our identification strategy.

The EPA, in spite of its cross-sectional nature, gathers information on respondents' labor force status 1 year ago that can be used to learn about their transitions into retirement. In addition, while it does not have the complete work history of individuals, it still contains information on the respondents' work experience, tenure and prior labor force status, as well as vital demographic characteristics, including respondents' marital status, family size and composition, number of employed adults in the household and partners' labor force status.

In addition to the EPA, we also gather data from various sources to examine the role that the labor, financial, and housing markets might have played on respondents' retirement decisions. We use the annual provincial unemployment rates – gathered from the Spanish National Statistics Institute *Encuesta de Población Activa* (2014a) – to capture the deteriorating labor market. We exploit the annual percentage change in the IBEX 35 index – the main stock market index in Spain obtained from quarterly closing values of the index from Yahoo! Finanzas IBEX 35. *Cotizaciones históricas* (2014) – to proxy for fluctuations in financial markets. Finally, we exploit annual percentage changes in provincial housing prices from the Spanish Ministry of Development (Ministerio de Fomento 2014) to proxy for the worsening housing market. Stock and housing prices are deflated using national and provincial consumer price indices, respectively (National Statistics Institute 2014b).

For our analysis, we select 50–69-year olds, which yields samples of 269,166 men and 292,109 women. We define an individual as retired if s/he reports having officially retired in the EPA, regardless of whether or not she worked during the past week.<sup>7</sup> The share of retirees in our sample is 30% for men and 11% for women. To study transitions into retirement, we further select individuals who report either being employed or unemployed in the previous year. Following Bossworth and Burtless (2010), we define being employed during the previous year as having worked at least 3 months during that time. Those who worked for less than 3 months but report looking for work for at least 6 months during the previous year are considered unemployed. When we restrict our analysis to those in the labor force during the prior year, an average of 4% of 154,983 men and 2.5% of 93,903 women appear to retire in any given year.

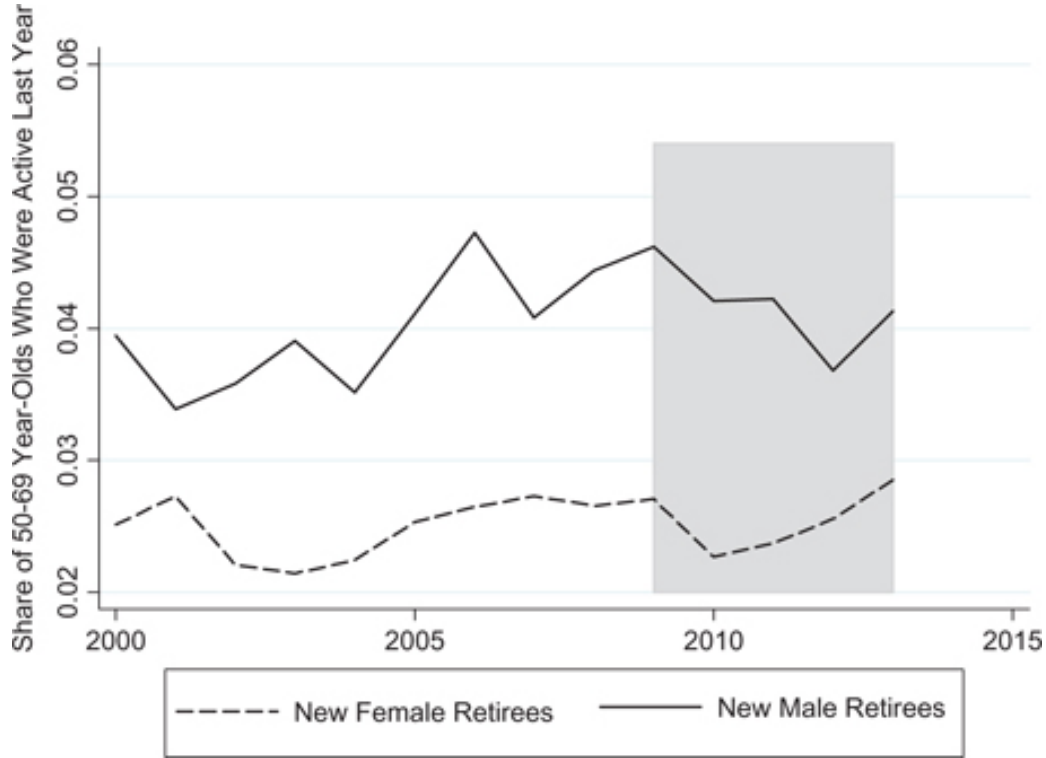
Table 1 informs about the characteristics of individuals in our sample according to their labor force statuses. An average of 4% of employed men and 1% of unemployed men aged 50–69 retire every year. The corresponding percentages for women are lower: 2.7% and 0.4%, respectively. These percentages have naturally fluctuated over time, as depicted in Figure 1, but a closer look at the recessionary period (shown as a shaded area) reveals no obvious trend in male and female retirement patterns. While the number of new male and female retirees dropped during the first year of the recession (i. e. 2009), it started to progressively rise for women, whereas it kept on dropping for men up until the last year of the downturn. At any rate, the displayed patterns are likely masking the influence of a number of factors we need to account for in order to isolate the impact of the economic downturn on men's and women's retirement patterns. For example, the latter are affected by the specific regime to which they have to ascribe depending on their type of work and industry. Up to 28% of employed men and 19.5% of working women are self-employed. In addition, approximately 8.7% of working men report working in the agriculture sector, and about 10% of women indicate being employed in the domestic service industry. In addition, on average, anywhere between 13% and 19% of men and women in the labor force is eligible for early retirement. Hence, we will control for whether the respondent is self-employed, working in the agriculture or domestic service industries, or eligible for early retirement.

**Table 1:** Descriptive statistics.

	Males			Females		
	Active	Employed	Unem- ployed	Active	Employed	Unem- ployed
Retired	0.041 (0.20)	0.043 (0.20)	0.011 (0.10)	0.025 (0.16)	0.027 (0.16)	0.004 (0.07)
Crisis dummy	0.399 (0.49)	0.383 (0.49)	0.656 (0.48)	0.484 (0.50)	0.471 (0.50)	0.618 (0.49)
Unemployment rate	0.148 (0.08)	0.145 (0.08)	0.200 (0.09)	0.156 (0.08)	0.153 (0.08)	0.190 (0.09)
Housing rate of return	0.014 (0.09)	0.016 (0.09)	−0.026 (0.09)	−0.003 (0.09)	−0.001 (0.09)	−0.022 (0.09)
IBEX35 rate of return	−0.022 (0.20)	−0.021 (0.20)	−0.035 (0.21)	−0.024 (0.20)	−0.023 (0.20)	−0.033 (0.21)
Self employed	0.266	0.282	0.009	0.178	0.195	0.006

	(0.44)	(0.45)	(0.10)	(0.38)	(0.40)	(0.08)
Agriculture sector	0.084	0.087	0.025	0.062	0.066	0.021
	(0.28)	(0.28)	(0.16)	(0.24)	(0.25)	(0.14)
Domestic service	0.009	0.009	0.004	0.094	0.101	0.025
	(0.10)	(0.10)	(0.06)	(0.29)	(0.30)	(0.16)
Age	55.970	55.973	55.915	55.588	55.633	55.129
	(4.39)	(4.41)	(3.96)	(4.37)	(4.41)	(3.87)
Potential experience	40.117	40.069	40.873	39.567	39.526	39.985
	(5.94)	(5.98)	(5.32)	(6.02)	(6.09)	(5.21)
Eligible for early	0.188	0.190	0.164	0.170	0.174	0.127
	(0.39)	(0.39)	(0.37)	(0.38)	(0.38)	(0.33)
Married	0.855	0.863	0.719	0.700	0.700	0.697
	(0.35)	(0.34)	(0.45)	(0.46)	(0.46)	(0.46)
Partner	0.867	0.874	0.759	0.712	0.711	0.722
	(0.34)	(0.33)	(0.43)	(0.45)	(0.45)	(0.45)
Immigrant	0.068	0.064	0.141	0.094	0.090	0.132
	(0.25)	(0.24)	(0.35)	(0.29)	(0.29)	(0.34)
<Primary education	0.083	0.080	0.142	0.088	0.086	0.107
	(0.28)	(0.27)	(0.35)	(0.28)	(0.28)	(0.31)
Primary education	0.337	0.335	0.372	0.295	0.290	0.341
	(0.47)	(0.47)	(0.48)	(0.46)	(0.45)	(0.47)
Secondary education	0.348	0.348	0.359	0.384	0.379	0.442
	(0.48)	(0.48)	(0.48)	(0.49)	(0.49)	(0.50)
College education	0.231	0.237	0.127	0.233	0.245	0.111
	(0.42)	(0.43)	(0.33)	(0.42)	(0.43)	(0.31)
No. adults	3.071	3.084	2.869	2.858	2.861	2.824
	(1.12)	(1.11)	(1.19)	(1.10)	(1.11)	(1.07)
% Other adults employed in HH	0.170	0.173	0.126	0.165	0.167	0.143
	(0.22)	(0.22)	(0.21)	(0.22)	(0.22)	(0.21)
Partner's age	45.021	45.439	38.484	40.193	40.201	40.113
	(19.44)	(19.05)	(23.82)	(27.10)	(27.16)	(26.49)
Partner eligible for early	0.083	0.084	0.059	0.223	0.226	0.189
	(0.28)	(0.28)	(0.24)	(0.42)	(0.42)	(0.39)
<Primary education-partner	0.081	0.078	0.117	0.060	0.059	0.064
	(0.27)	(0.27)	(0.32)	(0.24)	(0.24)	(0.25)
Primary education-partner	0.297	0.300	0.253	0.216	0.213	0.244
	(0.46)	(0.46)	(0.43)	(0.41)	(0.41)	(0.43)
Secondary education-partner	0.336	0.339	0.284	0.239	0.236	0.275
	(0.47)	(0.47)	(0.45)	(0.43)	(0.42)	(0.45)
College education-partner	0.140	0.144	0.079	0.180	0.186	0.121
	(0.35)	(0.35)	(0.27)	(0.38)	(0.39)	(0.33)
Life expectancy at birth	81.099	81.078	81.434	81.345	81.333	81.464
	(1.43)	(1.42)	(1.49)	(1.41)	(1.41)	(1.45)
Hospitalization rate (50–65 pop)	9.399	9.410	9.237	9.490	9.503	9.357
	(1.48)	(1.49)	(1.30)	(1.39)	(1.40)	(1.27)
Child dependency ratio	23.157	23.114	23.824	23.121	23.072	23.625
	(2.79)	(2.79)	(2.67)	(2.72)	(2.72)	(2.70)
Aged dependency ratio	25.313	25.327	25.095	25.394	25.411	25.214
	(5.62)	(5.63)	(5.44)	(5.57)	(5.59)	(5.38)
Observations	154,983	146,416	8,567	93,903	85,828	8,075

Source: EPA (2000–2013), M Fomento (1999–2013), Yahoo Finanzas (1999–2013), National Statistical Institute (2000–2013).



**Figure 1:** Transitions into retirement by gender over the business cycle.

Educational attainment can also importantly shape one's labor market status and transitions. Roughly one-third of men and women have a primary education, and another third have a secondary education. The remaining third have either less than primary schooling (about 8–9% of men and women) or a college education (approximately 23% of men and women). The vast majority of individuals in our sample have a partner (between 71 and 87%). Because retirement decisions are not made in a vacuum, we will account for the age, potential experience, educational attainment, and eligibility for early retirement of the partner in modeling retirement decisions, as well as for the share of employed household members, other than the respondent and her/his partner, among many other factors potentially driving respondents' labor market participation decisions.<sup>8</sup>

## 4. Methodology

Our *first* aim is to learn about changes in the retirement patterns of Spanish men and women following the recession. To that end, we start by examining how the past recession impacted male and female labor force *transitions* from employment and unemployment into retirement using the following model:

$$P_{iaept} = \alpha + \beta Crisis_t + X_i\gamma + \delta Early_{it} + \sum_a \eta_a age_{iept} + \sum_e \eta_e exp_{iept} + \sum_a \sum_e \eta_{ae} age_{iept} \times exp_{iept} + Z_{pt}\chi + \phi_p + \varepsilon_{iaept} \quad (1)$$

where  $P_{iaept}$  is the probability that the  $i$ th individual in age group  $a$ , with potential work experience  $e$  and residing in province  $p$ , changed her/his labor force status from employed or unemployed in  $t-1$  to being retired in period  $t$ . The variable  $Crisis$  is a dummy indicative of the onset of the economic downturn. Spain officially entered into a recession in the last quarter 2008, after gross domestic product shrank for two consecutive quarters (see Figure 1 in Appendix). Since we work with data from the second quarters of each year, the crisis dummy takes the value of 1 from 2009 onward.

The vector  $X$  includes a variety of individual level personal and job characteristics known to be correlated to the likelihood of retiring. In particular, we consider: (1) information on the type of public pension social security scheme (general, self-employed, agriculture, and domestic service) of the respondent in question; (2) demographic descriptors, such as marital status, educational attainment, and an immigrant dummy; and (3) family characteristics, such as the partner's age (and her/his age squared) and education, as well as whether there is a child living in the household and the proportion of employed adults in the household, other than the respondent and her/his partner.

In the Spanish public pension system, the level of retirement benefits and eligibility for early or normal retirement depend on age and the number of years the individual has paid into the system. Therefore, in all specifications, we include, first, an indicator variable *Early* that depends on age, years of contribution, and survey year in order to distinguish between individuals eligible and non-eligible for early retirement. In addition, we incorporate a battery of  $a$  dummy variables controlling for the respondent's age,  $e$  dummy variables accounting for the potential experience (as a proxy for years of contribution), and  $a \times e$  dummy variables for the (age  $\times$  potential experience) of the respondent as key determinants of her/his decision to retire.<sup>9</sup> As such, the model examines changes in the retirement likelihood of individuals with similar public pension incentives pre- versus post-recession.<sup>10</sup>

We also account for regional characteristics that are correlated to retirement decisions by respondents in the area, such as the province's population composition and health ( $Z_{pt}$ ) as captured by the youth dependency ratio (calculated as the ratio of under 16-year olds over the working-age population), the elderly dependency ratio (calculated as the ratio of over 65-year olds over the working-age population), life expectancy at birth, and hospitalization rate of the 50–65-year-old population (National Statistics Institute 2016). In this manner, we account for regional differences in retirement patterns that would prevail in the absence of a recession. Finally, eq. 1 also includes provincial fixed-effects ( $\varphi_p$ ), to address unobserved fixed provincial characteristics possibly correlated to retirement patterns. Equation 1 is estimated via OLS and standard errors are clustered at the province level.<sup>11</sup>

Our *second* aim is to gain a better understanding of specific determinants of male and female retirement patterns following the onset of the economic downturn. Were they driven by the deterioration of the labor market? Or were they responding to changes in the two types of assets that suffered the most during this period – namely housing and financial assets? To answer those questions, we next estimate eq. 2 also via OLS:

$$P_{iaept} = \alpha + \beta_1 IBEX35_t + \beta_2 HouseIndex_{pt} + \beta_3 Unemp_{pt} + X_i \gamma + \delta Early_{it} + \sum_a \eta_a age_{iapt} + \sum_e \eta_e exp_{iept} + \sum_a \sum_e \eta_{ae} age_{iapt} \times exp_{iept} + \sum_r \varphi_r Reforms_{rt} + Z_{pt} \chi + \phi_p + \varepsilon_{iaept} \quad (2)$$

where  $P_{iaept}$  continues to capture the probability that the  $i$ th individual in age group  $a$ , with potential work experience  $e$  and residing in province  $p$ , retires at time  $t$ . The variable  $IBEX35_t$  stands for the annual real percentage change in the IBEX35 index during the year preceding the quarter of interview of the individual;  $HouseIndex_{pt}$  is the annual percentage change in the real housing price index in province  $p$  and between year  $t-1$  and year  $t$ ; and  $Unemp_{pt}$  is the unemployment rate in province  $p$  in the year  $t$ . Equation 2 also includes the same regressors in vector  $X$  in eq. 1), as well as dummy variables capturing the period following the pension reforms of 2002, 2007, and 2011. Specifically, we include a dummy for after 2002 onward to account for the 2002 reform (Vegas-Sanchez et al. 2013), a dummy for after 2007 onward to account for the 2007 reform, and a dummy for year 2013 to account for the implementation of the 2011 reform (García-Gómez and Jiménez-Martín 2016).<sup>12</sup> Note that, given the inclusion of dummy variables capturing the age, potential experience and (age  $\times$  potential experience) categories of each individual in the sample, the model is effectively assessing the impact that the tracked labor, financial, and housing markets characteristics played in the retirement decisions of Spaniards pre- versus post-recession, net of pension-related incentives, and reforms for the public pension system. As in eq. 1), standard errors are clustered at the province level.

## 5. Main Findings

### 5.1 Did the Recession Accelerate or Delay Retirement among Older Workers?

To address that question, we estimate eq. 1 as a linear probability model. According to the estimates in column (1) of Table 2 and Table 3, the recession appeared to have slowed down retirement among women, who became 0.8 percentage points less likely to transition from the labor force into retirement. Given that only 2.5 percent of eligible 50–69-year-old women retire in any given year, this estimate implies a non-negligible reduction in that share of approximately 32%. This finding implies an increase in the aggregate labor participation rate of old-age women after 2008, as documented by Burtless and Bosworth (2013) using macroeconomic data on labor market participation trends. Quantitatively, the overall impact of the crisis on women's retirement decisions is economically significant and similar in magnitude to the effect of having a primary, versus a college, education.<sup>13</sup>

**Table 2:** The crisis and men's transitions to retirement.

Columns		(1)	(2)	(3)
Model specification		Transitions from active population	Transitions from employment	Transitions from unemployment
<b>Main regressors</b>	<b>Crisis</b>	−0.0024 (0.0024)	−0.0011 (0.0023)	−0.0161* (0.0095)
Individual controls	Married	0.0009 (0.0015)	−0.0012 (0.0021)	0.0031 (0.0047)
	Less than primary education	−0.0047 (0.0035)	−0.0029 (0.0038)	−0.0059 (0.0067)
	Primary education	−0.0007 (0.0025)	0.0008 (0.0026)	−0.0072 (0.0059)
	Secondary education	−0.0005 (0.0019)	0.0005 (0.0020)	−0.0070 (0.0048)
	Immigrant status	−0.0160*** (0.0026)	−0.0137*** (0.0028)	−0.0068** (0.0027)
	With partner	0.0010 (0.0032)	0.0011 (0.0030)	−0.0012 (0.0068)
	Number of adults	−0.0018*** (0.0006)	−0.0016*** (0.0006)	−0.0013 (0.0011)
	Whether children	−0.0013 (0.0010)	−0.0004 (0.0010)	−0.0060 (0.0040)
	Proportion of employed adults	−0.0004 (0.0024)	−0.0015 (0.0027)	0.0034 (0.0099)
Social security controls	Eligible for early retirement	0.0038 (0.0111)	0.0009 (0.0119)	−0.0079* (0.0046)
	Self-employed	−0.0279*** (0.0017)	−0.0303*** (0.0018)	−0.0084** (0.0033)
	Employment in agriculture	0.0078** (0.0031)	0.0067** (0.0031)	−0.0133*** (0.0044)
	Employment in pers. services	−0.0246*** (0.0055)	−0.0281*** (0.0057)	0.0049 (0.0180)
Partner's controls	Partner's age	−0.0006*** (0.0002)	−0.0006*** (0.0002)	−0.0001 (0.0003)
	Partner's age squared	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
	Partner eligible for early	0.0113*** (0.0035)	0.0109*** (0.0033)	−0.0043 (0.0064)
	Partner's less than primary	0.0081*** (0.0025)	0.0076*** (0.0026)	0.0054 (0.0071)
	Partner's primary education	0.0106*** (0.0014)	0.0102*** (0.0015)	0.0060 (0.0059)
	Partner's secondary education	0.0071*** (0.0012)	0.0070*** (0.0013)	0.0025 (0.0043)
Regional controls	Life expectancy	0.0022* (0.0013)	0.0023* (0.0013)	0.0029 (0.0037)
	Hospitalization rate	−0.0001 (0.0006)	−0.0003 (0.0007)	0.0018 (0.0016)
	Child dependency ratio	0.0014** (0.0006)	0.0017*** (0.0006)	−0.0013 (0.0012)
	Aged dependency ratio	−0.0004 (0.0004)	−0.0003 (0.0005)	0.0015 (0.0015)



Constant	−0.1753*	−0.1943**	−0.2341
	(0.0902)	(0.0950)	(0.2897)
Observations	154,983	146,416	8,567
Mean dependent variable	0.041	0.043	0.011
R-squared	0.2815	0.2899	0.0987

**Notes:** All specifications include a constant term, along with age, potential experience, and (age×potential experience) fixed effects. Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses.\*Significant at 10 %; \*\*significant at 5 %; \*\*\*significant at 1 %.

**Table 3:** The crisis and women's transitions to retirement.

Columns		(1)	(2)	(3)
Model specification:		Transitions from active population	Transitions from employment	Transitions from unemployment
<b>Main regressors</b>	<b>Crisis</b>	<b>−0.0079***</b> <b>(0.0018)</b>	<b>−0.0079***</b> <b>(0.0019)</b>	−0.0031 (0.0025)
Individual controls	Married	0.0003 (0.0027)	−0.0000 (0.0030)	0.0043 (0.0032)
	Less than primary education	−0.0122** (0.0054)	−0.0125** (0.0061)	0.0027 (0.0045)
	Primary education	−0.0066*** (0.0023)	−0.0068** (0.0026)	0.0050 (0.0030)
	Secondary education	−0.0043*** (0.0016)	−0.0042** (0.0016)	0.0021 (0.0029)
	Immigrant status	−0.0047 (0.0035)	−0.0031 (0.0040)	−0.0019 (0.0019)
	With partner	0.0080* (0.0044)	0.0094* (0.0048)	0.0027 (0.0068)
	Number of adults	−0.0014** (0.0006)	−0.0014** (0.0006)	−0.0021** (0.0008)
	Whether children	0.0003 (0.0011)	0.0008 (0.0012)	−0.0025** (0.0010)
	Proportion of employed adults	−0.0030* (0.0017)	−0.0037* (0.0019)	0.0042 (0.0033)
	Social security controls	Eligible for early retirement	0.0043 (0.0102)	0.0029 (0.0111)
	Self-employed	−0.0143*** (0.0013)	−0.0162*** (0.0013)	−0.0066* (0.0034)
	Employment in agriculture	0.0107** (0.0044)	0.0100** (0.0046)	−0.0066 (0.0077)
	Employment in pers. services	−0.0099*** (0.0018)	−0.0118*** (0.0020)	−0.0067*** (0.0020)
Partner's controls	Partner's age	−0.0004 (0.0003)	−0.0004 (0.0003)	0.0001 (0.0003)
	Partner's age squared	0.0000 (0.0000)	0.0000 (0.0000)	−0.0000 (0.0000)
	Partner eligible for early	0.0032* (0.0017)	0.0033* (0.0018)	0.0031 (0.0023)
	Partner's less than primary	−0.0023 (0.0038)	−0.0022 (0.0041)	−0.0018 (0.0035)
	Partner's primary education	−0.0042** (0.0016)	−0.0041** (0.0018)	−0.0020 (0.0029)

	Partner's secondary education	-0.0025 (0.0015)	-0.0025* (0.0014)	-0.0003 (0.0021)
Regional controls	Life expectancy	0.0040*** (0.0009)	0.0041*** (0.0010)	0.0009 (0.0011)
	Hospitalization rate	-0.0003 (0.0005)	-0.0005 (0.0006)	0.0013* (0.0007)
	Child dependency ratio	0.0004 (0.0005)	0.0004 (0.0005)	0.0009 (0.0007)
	Aged dependency ratio	-0.0001 (0.0006)	-0.0002 (0.0006)	0.0011 (0.0008)
Constant	-0.3388*** (0.0737)	-0.3493*** (0.0798)	-0.1391* (0.0796)	
Observations	154,983	146,416	8,567	
Mean dependent variable	0.025	0.027	0.004	
R-squared	0.2491	0.2544	0.1670	

**Notes:** All specifications include a constant term, along with province, age, potential experience, and (age×potential experience) fixed effects. Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses.\*Significant at 10 %; \*\*significant at 5 %; \*\*\*significant at 1 %.

In columns (2) and (3) of Table 2 and Table 3, we further explore the impact of the economic downturn on the retirement likelihood of older men and women in the labor force according to whether they were at work or unemployed.<sup>14</sup> When we differentiate between those two groups, we are able to see that some male transitions into retirement were also delayed with the onset of the recession, even though the effect is only, marginally, statistically different from zero. In particular, unemployed men became 2 percentage points less likely to retire – a twofold increase in the 1% male rate of transition from unemployment into retirement. In addition, differentiating according to their labor force status allows us to identify that the observed retirement delay among women in column (1) originates from those at work. For them, the likelihood of transitioning from employment into retirement dropped by roughly 0.8 percentage points – a 27% reduction in the proportion of women transitioning from work into retirement.<sup>15</sup>

## 5..2 What Role Did Labor, Housing, and Financial Shocks Play?

According to the estimates in the previous tables, the economic downturn delayed the retirement of both unemployed men and working women. However, what caused this reaction? In particular, what role did the recessionary labor market, as opposed to the bursting of the housing bubble or the drop in financial markets, play in shaping the retirement behavior of older Spaniards? To address these questions, we estimate eq. 2). Table 4 and Table 5 display the results from such an exercise. It becomes apparent that a deteriorating labor market – as captured by the unemployment rate – was mainly responsible for the 0.8 percentage point reduction in female transitions from employment into retirement. An increase in the unemployment rate of 10 percentage points – equivalent to the change in Madrid's unemployment rate from 2008 (when it was 9%) to 2013 (when it reached 19%) – lowers the retirement likelihood of working women by 0.5 percentage points or 20%. As hypothesized earlier, women might have chosen to stay longer at their jobs in order to make up for losses in household income from other unemployed household members or to rebuild retirement savings. However, we no longer find evidence of a reduced retirement likelihood of unemployed men during the recession. Accounting for the 2007 and 2012 reforms that facilitated earlier retirements sweeps away the marginally statistically significant impact from column (3) in Table 2.<sup>16</sup>

**Table 4:** The effect of labor, financial, and housing market conditions on men's transitions to retirement.

Specification:		Transitions from active population	Transitions from employment	Transitions from unemployment
Main regressors	Unemployment rate	-0.0140 (0.0147)	-0.0012 (0.0154)	-0.0718 (0.0429)
	Annual % in housing prices	-0.0155 (0.0198)	-0.0183 (0.0212)	0.0456 (0.0349)

	Annual % in IBEX	0.0033 (0.0035)	0.0036 (0.0036)	-0.0047 (0.0099)
Individual controls	Married	0.0009 (0.0015)	-0.0012 (0.0020)	0.0031 (0.0047)
	Less than primary education	-0.0047 (0.0035)	-0.0028 (0.0038)	-0.0058 (0.0068)
	Primary education	-0.0008 (0.0025)	0.0008 (0.0025)	-0.0072 (0.0060)
	Secondary education	-0.0005 (0.0019)	0.0005 (0.0020)	-0.0070 (0.0049)
	Immigrant status	-0.0160*** (0.0026)	-0.0137*** (0.0028)	-0.0069** (0.0027)
	With partner	0.0009 (0.0032)	0.0009 (0.0030)	-0.0012 (0.0065)
	Number of adults	-0.0018*** (0.0006)	-0.0016** (0.0006)	-0.0011 (0.0011)
	Whether children	-0.0010 (0.0009)	-0.0002 (0.0010)	-0.0058 (0.0040)
	Proportion of employed adults	-0.0005 (0.0024)	-0.0015 (0.0027)	0.0031 (0.0099)
	Social security controls	Eligible for early retirement	0.0035 (0.0110)	0.0007 (0.0117)
Self-employed		-0.0279*** (0.0017)	-0.0303*** (0.0018)	-0.0088** (0.0039)
Employment in agriculture		0.0078** (0.0031)	0.0067** (0.0031)	-0.0127*** (0.0044)
Employment in pers. services		-0.0245*** (0.0055)	-0.0279*** (0.0057)	0.0039 (0.0180)
Reform controls	After 2002	0.0046 (0.0030)	0.0051* (0.0030)	0.0020 (0.0068)
	After 2007	0.0000 (0.0039)	-0.0001 (0.0040)	-0.0027 (0.0114)
	After 2012	0.0002 (0.0045)	0.0008 (0.0052)	0.0016 (0.0051)
Partner's controls	Partner's age	-0.0006*** (0.0002)	-0.0006*** (0.0002)	-0.0001 (0.0004)
	Partner's age squared	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000 (0.0000)
	Partner eligible for early	0.0113*** (0.0035)	0.0109*** (0.0033)	-0.0045 (0.0065)
	Partner's less than primary	0.0083*** (0.0025)	0.0078*** (0.0026)	0.0054 (0.0071)
	Partner's primary education	0.0108*** (0.0014)	0.0104*** (0.0016)	0.0060 (0.0059)
	Partner's secondary education	0.0072*** (0.0012)	0.0070*** (0.0013)	0.0025 (0.0043)
Regional controls	Life expectancy	-0.0003 (0.0019)	-0.0006 (0.0020)	0.0031 (0.0056)
	Hospitalization rate	-0.0004 (0.0006)	-0.0005 (0.0007)	0.0010 (0.0015)
	Child dependency ratio	0.0015** (0.0006)	0.0018*** (0.0006)	-0.0009 (0.0012)
	Aged dependency ratio	-0.0002 (0.0006)	-0.0001 (0.0006)	0.0015 (0.0014)
Observations		154,983	146,416	8,567
	Mean dependent variable	0.041	0.043	0.011
	R-squared	0.2816	0.2899	0.0999

**Notes:** All specifications include a constant term, along with province fixed-effects and dummies for age, potential experience, and (age×potential experience). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province (shown in parentheses). \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

**Table 5:** The effect of labor, financial, and housing market conditions on women's transitions to retirement.

Specification:		Transitions from active population	Transitions from employment	Transitions from unemployment	
Main regressors	Unemployment rate	−0.0502*** (0.0170)	−0.0493*** (0.0180)	−0.0162 (0.0177)	
	Annual % in housing prices	0.0007 (0.0148)	0.0029 (0.0156)	0.0067 (0.0184)	
	Annual % in IBEX	−0.0063 (0.0052)	−0.0061 (0.0057)	−0.0087 (0.0085)	
Individual controls	Married	0.0004 (0.0027)	0.0000 (0.0030)	0.0044 (0.0031)	
	Less than primary education	−0.0121** (0.0055)	−0.0125** (0.0062)	0.0027 (0.0045)	
	Primary education	−0.0066*** (0.0023)	−0.0067** (0.0026)	0.0051 (0.0031)	
	Secondary education	−0.0043*** (0.0016)	−0.0042** (0.0016)	0.0020 (0.0030)	
	Immigrant status	−0.0045 (0.0035)	−0.0030 (0.0040)	−0.0021 (0.0019)	
	With partner	0.0080* (0.0043)	0.0095* (0.0048)	0.0026 (0.0068)	
	Number of adults	−0.0014** (0.0006)	−0.0014** (0.0006)	−0.0021** (0.0008)	
	Whether children	0.0003 (0.0012)	0.0008 (0.0013)	−0.0024** (0.0009)	
	Proportion of employed adults	−0.0030* (0.0018)	−0.0037* (0.0019)	0.0043 (0.0033)	
	Social security controls	Eligible for early retirement	0.0044 (0.0101)	0.0032 (0.0111)	0.0028 (0.0023)
		Self-employed	−0.0143*** (0.0013)	−0.0162*** (0.0013)	−0.0061* (0.0033)
		Employment in agriculture	0.0109** (0.0044)	0.0101** (0.0046)	−0.0065 (0.0077)
Employment in pers. services		−0.0099*** (0.0018)	−0.0118*** (0.0020)	−0.0067*** (0.0020)	
Reform controls	After 2002	−0.0033 (0.0029)	−0.0034 (0.0031)	−0.0013 (0.0035)	
	After 2007	−0.0058* (0.0033)	−0.0059 (0.0038)	−0.0023 (0.0057)	
	After 2012	0.0064** (0.0030)	0.0080** (0.0035)	0.0005 (0.0033)	
Partner's controls	Partner's age	−0.0004 (0.0003)	−0.0005 (0.0003)	0.0001 (0.0003)	
	Partner's age squared	0.0000 (0.0000)	0.0000 (0.0000)	−0.0000 (0.0000)	
	Partner eligible for early	0.0032* (0.0017)	0.0032* (0.0018)	0.0032 (0.0023)	
	Partner's less than primary	−0.0023 (0.0037)	−0.0022 (0.0040)	−0.0020 (0.0034)	
	Partner's primary education	−0.0042** (0.0016)	−0.0040** (0.0018)	−0.0021 (0.0029)	
	Partner's secondary education	−0.0025 (0.0015)	−0.0025* (0.0014)	−0.0003 (0.0022)	

Regional controls	Life expectancy	0.0053*** (0.0018)	0.0056*** (0.0020)	0.0018 (0.0029)
	Hospitalization rate	-0.0003 (0.0006)	-0.0004 (0.0007)	0.0013* (0.0007)
	Child dependency ratio	0.0000 (0.0005)	-0.0000 (0.0005)	0.0008 (0.0007)
	Aged dependency ratio	-0.0006 (0.0006)	-0.0008 (0.0007)	0.0011 (0.0007)
Observations	93,903	85,828	8,075	
Mean dependent variable	0.025	0.027	0.004	
R-squared	0.2491	0.2544	0.1672	

**Notes:** All specifications include a constant term, along with province fixed-effects and dummies for age, potential experience, and (age×potential experience). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province (shown in parentheses). \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

In sum, older working women delayed their retirement likelihood in response to the deterioration of the labor market by a non-negligible amount, whereas men did not.

### 5.3 Robustness Checks

One shortcoming of the analysis in Table 4 and Table 5 is that the inability to include year fixed-effects perfectly collinear with the yearly variations in the IBEX. Instead, to better capture the impact of labor, housing, and financial market fluctuations above and beyond the regular trends exhibited by these markets at the local and national levels, we repeat the analysis in Table 4 and Table 5 including regional time trends capturing the unobserved local economic tendencies that are not, necessarily, characteristic of the crisis. Even though accounting for local economic trends might capture much of the labor, housing, and financial markets' fluctuations we aim to measure, we continue to find that increases in the unemployment rate are primarily responsible for the retirement delay exhibited by women at work. An increase in the unemployment rate of 10 percentage points then lowers the retirement likelihood of working women by 0.7 percentage points or 28%. In addition, unemployed men marginally delay their retirement in response to housing value losses. Specifically, a decline in housing values of 10 percentage points – similar to those experienced in the province of Málaga from 2007 (when it was 1%) to 2009 (when it reached -11%) – reduces their retirement propensity by 0.7 percentage points or 60%.

Next, we explore the sensitivity of our findings to the exclusion of potentially endogenous partner controls. In particular, we exclude the indicators for the age and educational attainment of the partner, as well as information on the proportion of employed adults (other than the respondent and her/his partner) in the household. Table 7 presents the results from this additional robustness check. As in Table 5, we continue to find similar retirement delays of working women in response to a deteriorating labor market. As such, the results in Table 7 suggest that, if anything, including the partner's age and educational attainment, along with information on the share of employed household members (other than the respondent and her/his partner), yields an underestimate of the impact that unemployment rates appear to have had on women's retirement behavior.

**Table 6:** Robustness check 1 – including province-specific linear time trends.

Specification	(1)	(2)	(3)
Dependent variable	Transitions from active population	Transitions from employment	Transitions from unemployment
		<b>Men</b>	
Unemployment rate	-0.0274 (0.0212)	-0.0237 (0.0219)	0.0324 (0.0748)
Annual % in housing prices	-0.0137 (0.0194)	-0.0175 (0.0205)	<b>0.0736*</b> (0.0390)
Annual % in IBEX	0.0017 (0.0039)	0.0021 (0.0039)	-0.0045 (0.0096)
Observations	154,983	146,416	8,567
Mean dependent variable	0.041	0.043	0.011
R-squared	0.2813	0.2898	0.1078

		<b>Women</b>	
Unemployment rate	<b>-0.0746***</b> (0.0224)	<b>-0.0783***</b> (0.0242)	-0.0125 (0.0283)
Annual % in housing prices	0.0137 (0.0140)	0.0169 (0.0151)	0.0076 (0.0188)
Annual % in IBEX	-0.0056 (0.0055)	-0.0056 (0.0061)	-0.0057 (0.0073)
Observations	93,903	85,828	8,075
Mean dependent variable	0.025	0.027	0.004
R-squared	0.2495	0.2548	0.1706

**Notes:** All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service), demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner's age, partner's educational attainment, and proportion of employed adults in the household other than himself or his partner), and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province, age, potential experience, and (age×potential experience) fixed effects, as well as province-specific linear time trends. Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses. \*Significant at 10 %; \*\*significant at 5 %; \*\*\*significant at 1 %.

**Table 7:** Robustness check 2 – excluding potentially endogenous partner variables.

<b>Columns</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
<b>Model specification</b>	<b>Transitions from active population</b>	<b>Transitions from employment</b>	<b>Transitions from unemployment</b>
			<b>Men</b>
Unemployment rate	-0.0119 (0.0148)	0.0011 (0.0154)	-0.0716 (0.0429)
Annual % in housing prices	-0.0145 (0.0200)	-0.0175 (0.0215)	0.0470 (0.0351)
Annual % in IBEX	0.0033 (0.0034)	0.0036 (0.0036)	-0.0047 (0.0099)
Observations	154,983	146,416	8,567
Mean dependent variable	0.041	0.043	0.011
R-squared	0.2809	0.2893	0.0995
			<b>Women</b>
<b>Unemployment rate</b>	<b>-0.0501***</b> (0.0171)	<b>-0.0491***</b> (0.0181)	-0.0197 (0.0186)
Annual % in housing prices	0.0006 (0.0147)	0.0026 (0.0155)	0.0056 (0.0183)
Annual % in IBEX	-0.0063 (0.0052)	-0.0062 (0.0057)	-0.0089 (0.0084)
Observations	93,903	85,828	8,075
Mean dependent variable	0.025	0.027	0.004
R-squared	0.2489	0.2542	0.1662

**Notes:** All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service) and demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province fixed-effects, as well as dummies for age, potential experience, and (age×potential experience), and a set of dichotomous variables capturing the various pension reforms (after 2002, after 2007, and after 2012). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses. \*Significant at 10 %; \*\*significant at 5 %; \*\*\*significant at 1 %.

## 5.4 Heterogeneous Impacts

Once we have observed that there were retirement delays among working women in response to the deteriorating labor market, it is worth exploring how widespread these changes were. Did they differ according to

their educational attainment or eligibility for earlier retirement? And were the impacts observed for *both* full and partial retirements?

To address these questions, we start by splitting the sample of 50–69-year olds into university and nonuniversity educated individuals. According to the estimates in the first two columns of Table 8, the retirement delay of women in response to a deteriorating labor market was present, regardless of their educational attainment. However, the effect is larger and more precisely estimated for college educated women, for whom an increase in the unemployment rate of 10 percentage points leads to a reduction in their retirement likelihood of about 0.9 percentage points or 34%. In the next two columns of Table 8, we repeat the same exercise – this time distinguishing according to whether the respondent was eligible for early retirement. It is evident that the impact of a deteriorating labor market on women’s retirement likelihood was primarily driven by women who were eligible to retire early.

**Table 8:** Heterogeneous effects by educational attainment and eligibility for early retirement.

Column Heterogeneity by	(1) Educational attainment			(3) Eligibility for early retirement	
	No University	University		Non-eligible	Eligible
			<b>Men</b>		
Unemployment rate	−0.0073 (0.0161)	−0.0480 (0.0327)		−0.0038 (0.0100)	−0.0243 (0.0512)
Annual % in housing prices	−0.0163 (0.0204)	−0.0101 (0.0250)		0.0105 (0.0106)	−0.1014 (0.0665)
Annual % in IBEX	0.0044 (0.0041)	0.0023 (0.0066)		0.0014 (0.0025)	0.0092 (0.0135)
Observations	129,012	25,971		120,546	34,437
Mean dependent variable	0.042	0.038		0.011	0.167
R-squared	0.3081	0.1789		0.0170	0.2799
			<b>Women</b>		
<b>Unemployment rate</b>	<b>−0.0379*</b> <b>(0.0191)</b>	<b>−0.0856***</b> <b>(0.0302)</b>		0.0011 (0.0096)	<b>−0.2792***</b> <b>(0.0750)</b>
Annual % in housing prices	0.0007 (0.0146)	−0.0088 (0.0280)		−0.0106 (0.0079)	0.0494 (0.0624)
Annual % in IBEX	−0.0037 (0.0056)	−0.0155 (0.0103)		0.0027 (0.0031)	−0.0427 (0.0279)
Observations	75,144	18,759		75,677	18,226
Mean dependent variable	0.025	0.025		0.006	0.119
R-squared	0.2722	0.2128		0.0212	0.2373

**Notes:** All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service), demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner’s age, partner’s educational attainment, and proportion of employed adults in the household other than himself or his partner), and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province fixed-effects, as well as dummies for age, potential experience, and (age×potential experience), and a set of dichotomous variables capturing the various pension reforms (after 2002, after 2007, and after 2012). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses.

\*Significant at 10 %; \*\*significant at 5 %; \*\*\*significant at 1 %.

Finally, in Table 9, we experiment with alternative definitions of retirement. In the first column, we consider *full retirement* – which we define as indicating to be officially retired and not having worked over the past week. Subsequently, in column (2), we consider what we refer to as *partial retirement* – namely, indicating to have officially retired but having worked a positive number of hours over the last week. As the estimates in column (1) of Table 5 suggested for our broader measure of retirement, we continue to find that only women appear to have significantly delayed their *full* retirement likelihood in response to a deteriorating labor market. In contrast, if we consider *partial* retirement, we find that the worsening labor market (as captured by rising unemployment rates) lowered both men’s and women’s likelihood of partially retiring. The effect is particularly strong among men, possibly signaling poorer opportunities for partial employment during the recession.

**Table 9:** Heterogeneous effects by type of retirement.

Columns Model specification	(1) Total retirement	(2) Partial retirement
	<b>Men</b>	
<b>Unemployment rate</b>	0.0163 (0.0160)	<b>-0.0358***</b> <b>(0.0082)</b>
Annual % in housing prices	-0.0103 (0.0187)	-0.0068 (0.0056)
Annual % in IBEX	0.0027 (0.0042)	0.0008 (0.0026)
Observations	154,104	149,128
Mean dependent variable	0.034	0.006
R-squared	0.2898	0.0723
	<b>Women</b>	
<b>Unemployment rate</b>	<b>-0.0299**</b> <b>(0.0135)</b>	<b>-0.0216**</b> <b>(0.0095)</b>
Annual % in housing prices	0.0091 (0.0131)	-0.0080 (0.0070)
Annual % in IBEX	-0.0077* (0.0045)	0.0007 (0.0025)
Observations	93,609	91,827
Mean dependent variable	0.021	0.004
R-squared	0.2673	0.0485

**Notes:** The sample in column (1) includes all retired with no working hours together with all employed and unemployed individuals. In column (2), it includes all retired with positive working hours together with all employed and unemployed individuals. All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service), demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner's age, partner's educational attainment, and proportion of employed adults in the household other than himself or his partner), and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province fixed-effects, as well as dummies for age, potential experience, and (age×potential experience), and a set of dichotomous variables capturing the various pension reforms (after 2002, after 2007, and after 2012). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses. \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

In sum, the deteriorating labor market witnessed over the past recession delayed older women's partial and full retirement likelihood, especially among college educated women eligible for early retirement. Among men, we do not find much evidence of heterogeneous impacts. Only when examining the likelihood of being partially at work after having officially retired are we able to find evidence of how men, too, became less likely to be in this situation as the labor market deteriorated.

## 6. Further Inquiry into Female Retirement Decisions

The results in Table 2, Table 3, Table 4, Table 5, Table 6, Table 7, Table 8, Table 9 reveal that the recession had its largest impact on working women, who in response to a deteriorating labor market, decided to postpone their retirement. Women's response is suggestive of their role as secondary household earners. Since the downturn particularly hurt male employment through the collapse of sectors such as construction, it seems plausible that women might have wanted to prolong their working lives in order to make up for a loss of household income (if some family members became unemployed) and/or to rebuild their nest eggs. To assess if that is, indeed, a likely explanation for our findings, we focus our attention on couples and estimate eq. 2 for various subgroups of respondents: (1) those with a partner, (2) those with an employed partner, and (3) those with a nonworking partner.

Table 10 displays the results from this exercise. As in our prior findings, we continue to find consistent evidence that higher unemployment rates induced women to postpone their retirement. The effect seems to be primarily driven by women with non-working partners. Note that the latter include, not only retirees and unemployed partners, but also discouraged workers who no longer qualify as unemployed as they gave up searching for a job. The rate of retirement for women in this group is 4.5%, much larger than the 0.8% found among women with working partners. As shown in column (3) of Table 10, a 10 percentage point increase in the unemployment rate reduces the retirement rate of women with a nonworking partner by 1.2 percentage points (or 26%). These women, who might had already retired in the absence of an economic downturn, became more



likely to prolong their working lives, maybe in order to sustain a household or to make up for lost household earnings.

**Table 10:** Heterogeneous effects by partners' labor force status for couples.

Columns Model specification	(1) With a partner	(2) With a working partner	(3) With a non-working partner
		<b>Men</b>	
Unemployment rate	−0.0127 (0.0153)	−0.0004 (0.0164)	−0.0272 (0.0220)
Annual % in housing prices	−0.0168 (0.0184)	0.0021 (0.0200)	−0.0279 (0.0219)
Annual % in IBEX	0.0048 (0.0035)	0.0022 (0.0046)	0.0063 (0.0045)
Observations	135,066	50,943	84,123
Mean dependent variable	0.041	0.024	0.052
R-squared	0.2812	0.2385	0.3005
		<b>Women</b>	
<b>Unemployment rate</b>	<b>−0.0594***</b> <b>(0.0204)</b>	−0.0102 (0.0126)	<b>−0.1191**</b> <b>(0.0459)</b>
Annual % in housing prices	−0.0077 (0.0148)	−0.0174 (0.0104)	0.0013 (0.0308)
Annual % in IBEX	−0.0080 (0.0052)	−0.0053 (0.0042)	−0.0123 (0.0110)
Observations	66,490	38,229	28,261
Mean dependent variable	0.024	0.008	0.045
R-squared	0.2762	0.1960	0.3097

**Notes:** The sample in column (1) refers to respondents with a partner; column (2) to respondents with a working partner, and column (3) to respondents with a nonworking partner (whether inactive or unemployed). All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service), demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner's age, partner's educational attainment, and proportion of employed adults in the household other than himself or his partner), and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province fixed-effects, as well as dummies for age, potential experience, and (age×potential experience), and a set of dichotomous variables capturing the various pension reforms (after 2002, after 2007, and after 2012). Observations are weighted using the individual weights in the EPA. Standard errors are clustered by province. Standard errors are shown in parentheses. \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

## 7. Summary and Conclusions

The recession that started in the United States in December 2007 has had a significant impact on the Spanish economy through large hikes in the unemployment rate and the bursting of the housing and financial bubbles. In this paper, we explore how the crisis and the aforementioned changes in the labor, housing, and financial markets might have impacted, if at all, the retirement patterns of Spanish men and women nearing retirement age. We find that the recession lowered women's retirement likelihood by 0.8 percentage points or roughly 27%. This impact, primarily driven by increases in the overall unemployment rate, was circumscribed to those at work and driven by married women with a non-working partner. This is suggestive of working women choosing to prolong their working lives to make up for reductions in household income and wealth.

Recent cross-country analysis has warned of reductions in the upward trend of labor participation rates among 60–75-year olds in Southern Europe following the onset of the recent economic crisis (Burtless and Bosworth 2013). In that vein, evidence for the United States has pointed to the hastening of retirement following the Great Recession (Coile & Levine 2011b; Bosworth 2012). The notable impact of the recent economic downturn on employment rates in Spain raised the possibility that those unemployed or those whose working conditions had considerably worsened after 2008 might have chosen to retire earlier, with the consequent negative effect on the already strained public finances. We find no evidence of such patterns. On the contrary, older workers have prolonged their working lives. Still, the long-term consequences of population aging remain a challenge for Spain's public finances.

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## Notes

<sup>1</sup>Unemployment rates varied substantially both temporally and geographically. For example, in 2007, unemployment rates ranged from 4% in Alava to 14% in Cordoba. In 2013, unemployment rates had reached 15% in Alava and 33% in Cordoba.

<sup>2</sup>For example, OECD (2014) includes Spain, Greece, Italy, Portugal, and Slovenia in the group of countries with high structural unemployment, whereas Tulin and Vorms (2014) discuss the resilience of European house prices during the recession, except in Ireland.

<sup>3</sup>Sailor and coal miners are also subject to special schemes, but Boldrin and Jiménez-Martín (2007) point out that their rules and regulations are very similar to the ones in the general scheme.

<sup>4</sup>The new regulation required a 6-month unemployment spell prior to early retirement. However, García-Perez *et al.* (2013) suggest firms and workers manipulated this requirement to increase early retirement eligibility.

<sup>5</sup>In particular, in 2013, the retirement age for a full pension benefit increased from 65 years to 65 years and 1 month. In addition, the earnings base became averaged over the past 16 years, as opposed to the 15 years from before.

<sup>6</sup>As Farré *et al.* (2011), among others, we use the second quarters in order to minimize seasonality effects.

<sup>7</sup>Later on, we experiment with alternative definitions of retirement that distinguish between those who indicate to have officially retired but worked some during the preceding week (*partial* retirement) and those who did not (*full* retirement).

<sup>8</sup>In addition, Table 7 displays the estimates of model specifications that do not account for these potentially endogenous regressors in order to assess the sensitivity of our findings to their inclusion in the model.

<sup>9</sup>Potential experience is our proxy for years of contribution. It is computed as the difference between age and the required age to officially complete the educational attainment level of the respondent.

<sup>10</sup>Note, however, that year fixed-effects are collinear to the crisis dummy in eq. 1), inhibiting us from accounting for potentially important changes in the regulation of public pensions taking place in 2002, 2007, and 2013. Our second model specification (to be explained in what follows) will address that shortcoming.

<sup>11</sup>In Appendix, we also show the results without clustering and with robust White standard errors.

<sup>12</sup>We also include dummy variables for the years 2001 and 2002 to account for increases in the number of years used to compute average gross wages in pension calculations following the 1997 reform (Boldrin and Jiménez-Martín 2007). Given that the IBEX index changes only over time, we cannot include year fixed effects in this model specification. However, as a robustness check, we also estimate the model including time trends in Table 6. In that manner, the coefficients capture the impact that labor, housing and financial market fluctuations above and beyond those captured by local economic trends had on respondents' retirement decisions.

<sup>13</sup>Specifically, the economic downturn lowers women's retirement propensity by 19%, whereas having a primary education (as opposed to a college degree) depresses it by 17%.

<sup>14</sup>Another alternative is transition to disability. We do not consider that transition due to the very small number of observations (men or women) in this situation.

<sup>15</sup>As a robustness check, we reestimate the models in Table 2 and Table 3 including the partner's labor force status, naturally an important determinant but, also, likely endogenous. Results, displayed in Table 11 in Appendix, remain robust to their inclusion in the model.

<sup>16</sup>As with the estimation of eq. 1 in Tables Table 2 and Table 3, we experiment with reestimating eq. 2 with controls for the partner's labor force status, as well as including the crisis indicator. Results, which are displayed in Table 12, remain robust; however, due to the correlation of the crisis dummy with the variables capturing the labor, housing, and financial market fluctuations, the coefficients on the latter are understandably smaller in magnitude.

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Appendix

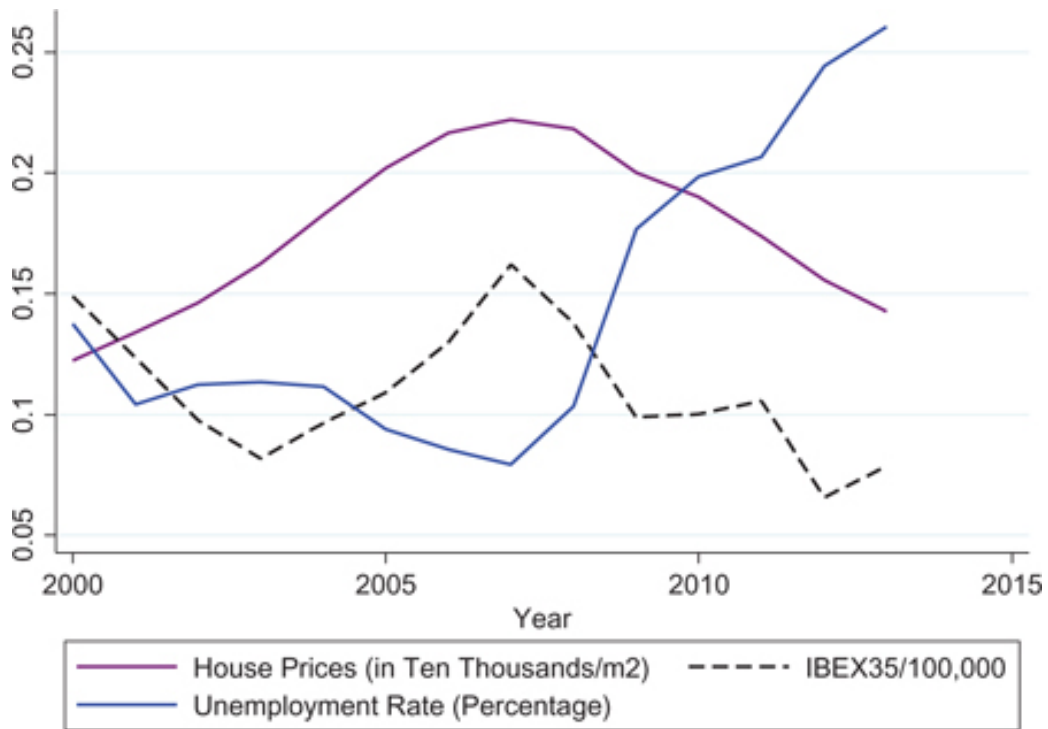


Figure 2: Trends in unemployment rates, housing prices, and the IBEX

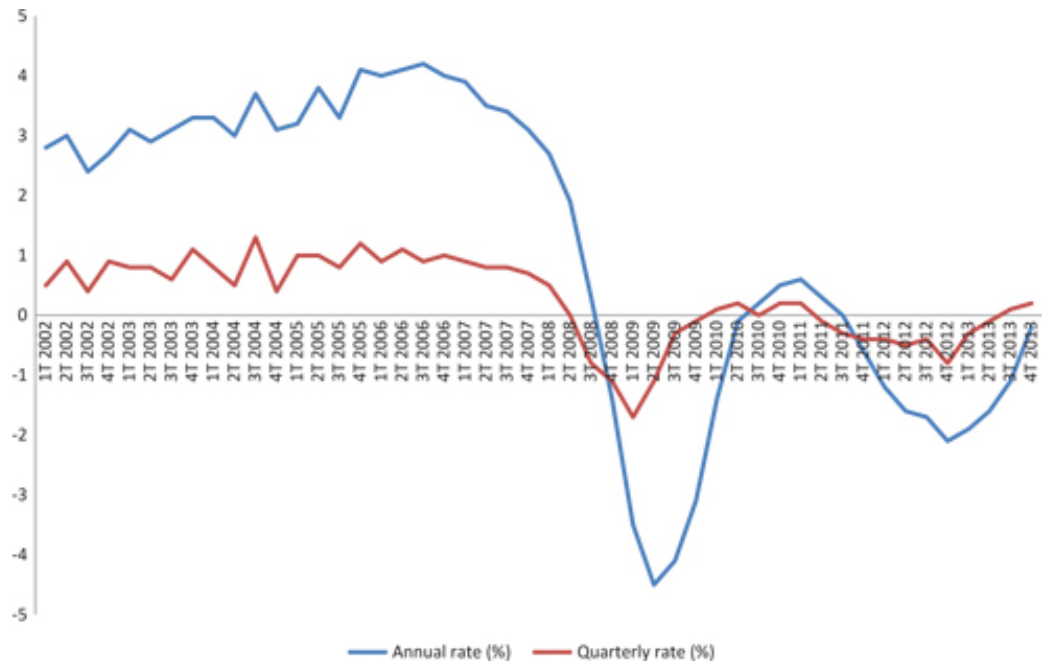


Figure 3: Trend in GDP growth.

Table 11: The crisis and transitions to retirement using an alternative model specification.

Columns Model specification	(1) Transitions from active population	(2) Transitions from employment	(3) Transitions from unemployment
Crisis	-0.0025	Men -0.0012	-0.0162**

	(0.0020)	(0.0021)	<b>(0.0063)</b>
Observations	154,983	146,416	8,567
R-squared	0.2816	0.2900	0.0989
		<b>Women</b>	
<b>Crisis</b>	<b>-0.0081***</b>	<b>-0.0082***</b>	-0.0031
	<b>(0.0022)</b>	<b>(0.0023)</b>	<b>(0.0034)</b>
Observations	93,903	85,828	8,075
R-squared	0.2494	0.2547	0.1669

**Notes:** All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service), demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner's age, partner's educational attainment, proportion of employed adults in the household other than himself or his partner, and partner's labor force status) and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province, age, potential experience, and (age×potential experience) fixed effects. Observations are weighted using the individual weights in the EPA. Robust standard errors are shown in parentheses. \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.

**Table 12:** Effect of markets on transitions to retirement using an alternative model specification.

Columns Model specification:	(1) Transitions from active population	(2) Transitions from employment	(3) Transitions from unemployment
		<b>Men</b>	
Crisis	0.0009 (0.0029)	0.0009 (0.0030)	-0.0092 (0.0096)
Unemployment rate	-0.0185 (0.0171)	-0.0054 (0.0182)	-0.0485 (0.0498)
Annual % in housing prices	-0.0157 (0.0122)	-0.0186 (0.0127)	0.0440 (0.0362)
Annual % in IBEX	0.0035 (0.0047)	0.0038 (0.0051)	-0.0031 (0.0085)
Observations	154,983	146,416	8,567
R-squared	0.2817	0.2901	0.1001
		<b>Women</b>	
Crisis	-0.0034 (0.0032)	-0.0028 (0.0034)	-0.0074 (0.0053)
<b>Unemployment rate</b>	<b>-0.0403**</b>	<b>-0.0413*</b>	0.0053 (0.0217)
	<b>(0.0200)</b>	<b>(0.0221)</b>	
Annual % in housing prices	-0.0006 (0.0134)	0.0017 (0.0145)	0.0045 (0.0170)
Annual % in IBEX	-0.0058 (0.0051)	-0.0057 (0.0055)	-0.0074 (0.0089)
Observations	93,903	85,828	8,075
R-squared	0.2495	0.2548	0.1675

**Notes:** All specifications include a constant term, along with the following controls: a dummy for eligibility for early retirement, the type of public pension social security scheme (general, self-employed, agriculture, and domestic service) and demographic descriptors (marital status, educational attainment, an immigrant dummy, and a children-under-18 indicator), family characteristics (a quadratic on his partner's age, partner's educational attainment, proportion of employed adults in the household other than himself or his partner, and partner's labor force participation) and region health and population characteristics (life expectancy, hospitalization rates, and young and aged dependency ratios). In addition, all regressions include province fixed-effects, as well as dummies for age, potential experience, and (age×potential experience), and a set of dichotomous variables capturing the various pension reforms (after 2002, after 2007, and after 2012). Observations are weighted using the individual weights in the EPA. Robust standard errors are shown in parentheses. \*Significant at 10%; \*\*significant at 5%; \*\*\*significant at 1%.