Home ownership and the retirement decision

Kees Dol and Nicholas Horsewood

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Abstract

Whereas early retirement schemes were seen as an important part of economic restructuring until the 1990s, the demographic time bomb has stimulated governments to reconsider such policies. The global financial crisis has accelerated policies that actually promote working beyond the age of 65 as public pension provision as well as (semi) private pension funds have come under pressure. Home ownership forms a major asset which can provide, in principle, a route towards early retirement or may hamper any policies that stimulate working past retirement. This study analyses the role of tenure on both the macro and the micro level: both for early and 'late' retirement. Controlling for other relevant factors we find that mortgage debt delays retirement. On a micro level we also find that housing costs in general can play a role, such that both renters and owners with low net housing costs (rent or mortgage) have higher odds of retiring early.

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Introduction

The aim of this paper is to examine the extent to which home ownership affects the timing of retirement, specifically the decision to withdraw from active participation in the labour market, early or late, relative to the formal age of retirement operating in the worker's country of residence. In this it builds on earlier work (Doling and Horsewood 2003) which established that the decision to retire early appeared to be related, *inter alia*, to two aspects of home ownership: increasing numbers of older Europeans who owned their homes outright were able to live rent free, while rapidly rising house prices also enhanced the potential for them to draw on housing equity, for example by moving down market or taking a reverse mortgage product. In combination, home ownership provided many with an ability to get by without or with less of an income from paid employment.

Over the last decade, there have been a number of developments that have impacted on the policy context of the early retirement phenomena, which had earlier been a feature of European labour markets. From the 1980s, there had been a general consensus among policy makers and businesses in many EU-countries that it was advantageous to facilitate, and even actively encourage, early retirement as a way of managing the restructuring of economies and individual firms. This contributed to the development, especially marked in some member states, of an "early retirement" culture manifested in increasing proportions of people retiring in advance of the formal retirement age in their country (see European Commission 2012; OECD 2005).

From the late 1990s, and especially in the 2000s, the consensus shifted toward a view that, for national economies, early retirement was not desirable, and indeed that a preferred outcome would be for people to extend their working lives even beyond the then formal retirement age (see European Commission 2012). The origin of this shift was demographic change. The ageing of populations and the trends in dependency ratios prompted a re-assessment of the sustainability of pension systems and the recognition of a pension crisis. One of the solutions was seen to be an extension of the working life reflecting longer life expectancies and pushing back the age at which people would be drawing on pensions. Alongside this has come a recognition that in many member states demographic changes also meant that there would be a reduction in the size of the workforce which would have consequences for the future size of national economies and GDP growth. Extending working lives was here also seen as part of the solution.

This shifting policy context has been further influenced, directly and indirectly, by the post-2007 financial and economic crises. On the one hand this has ratcheted up the fiscal challenges facing member state governments, putting additional pressure on them to depress publicly-funded pension entitlements. One policy response to this has been to discourage early retirement and promote the extension of the working life. On the other hand, the impact on housing markets has generally been a slowing or even reversal of house price developments so reducing the potential of home owners to draw on their housing equity anyway.

In combination these developments have, then, reduced the ability of Europeans to retire in advance of the formal age of retirement operating in their country of residence, and increased pressure on them to continue working longer. Insofar as, now,

in all member states significant numbers of workers are either early or late retirees, any study of this aspect of the supply of labour needs appropriately to consider both. The intention here is to identify the extent to which home ownership constitutes a significant driver of decisions about the timing of retirement, be that early or late.

The next and second section of this paper considers, in more detail, the policy context of the shift to extending working lives and the extent to which that has been achieved. This is followed by the third section in which the literature about the drivers of the willingness to extend the working life, and the place of home ownership within those drivers, is reviewed. The third section presents key aspects of the methodology used, with the fourth and fifth sections presenting findings of the study of early and late retirement respectively. The last section provides concluding comments.

1. The policy context: from early to late retirement models

From the early 1970s early retirement was in many member states seen as an appropriate solution to the need to restructure economies and the consequent rise of mass unemployment. Employers, labour unions and governments drew on pension surpluses and tax revenue to develop early retirement, sickness and disability schemes and to make them more attractive and accessible to older workers. This enabled companies to cut labour forces with minimal social and political unrest (Ebbinghaus 2008). Early retirement policies also attempted to improve possibilities for young people to access the labour market. These schemes persisted well into the 1990s (OECD, 2005). Table 1 shows that in 2002, the active, pre-retirement participation rate was in some countries – notably in the north western, corporatist and the eastern member states - under 50 per cent. In contrast, the social democratic countries with their focus on full employment had rates above 50 per cent.

At the end of the 1990s the European Union acknowledged the future economic challenges as a result of an ageing population. In 2001, the Stockholm European Council produced a review and extension of the Lisbon Strategy (2000) to manage this: firstly, by public debt reduction, secondly, by increasing employment participation of older workers and thirdly, by reforming social security systems (see European Commission, 2012).

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Table 1: Early and late retirement in Europe (employed and unemployed*)

		Early retirement % 55-64 years who are active		Late retirement % 65-70 who are active	
		2002	2011	2002	2011
Social democratic	Denmark	60.4	63.2	12.5	13.7
	Finland	52.1	60.9	5.0	11.8
	Sweden	71.2	75.9	13.8	15.8
Corporatist	Belgium	27.7	40.3	2.1	3.9
	France	36.7	44.4	2.1	5.2
	Germany	43.9	64.0	5.4	10.2
	Austria	30.8	42.9	5.0	9.5
	Luxembourg	28.2	40.4	2.9	6.7
	Netherlands	43.3	58.5	8.8	11.9
Liberal	Ireland	49.3	55.3	15.0	16.3
	United Kingdom	55.3	59.7	12.8	19.7
Southern	Greece	40.9	43.1	10.2	8.9
	Spain	42.7	52.3	3.9	5.1
	Italy	30.2	39.5	6.6	7.7
	Cyprus	51.3	58.0	18.1	16.4
	Malta	30.7	32.6	--	6.4
	Portugal	53.4	53.7	27.4	22.4
Eastern	Bulgaria	31.8	48.3	6.1	6.8
	Czech Republic	42.4	50.6	8.1	9.5
	Estonia	55.7	64.7	19.0	20.1
	Latvia	46.3	59.8	14.8	13.7
	Lithuania	46.9	58.4	11.4	13.1
	Hungary	26.4	39.2	3.1	5.1
	Poland	29.1	39.6	10.7	9.5
	Romania	37.9	41.5	31.8	22.9
	Slovenia	25.2	33.3	9.9	8.9
	Slovakia	26.9	46.0	2.0	4.1

Note: active means workers in employment plus unemployed but available for work.
Source: Eurostat, table lfsi_act_a

Although early retirement was still used in the 2000s, measures throughout Europe have been taken to roll it back. For example, Germany, which relies strongly on the public pay-as-you-go system, and which has a rapidly ageing population, took additional measures to stimulate more private pension savings in the so called Riester-pension in 2002: Riester being the responsible government minister at the time. More

generally, the moves to roll back policies boosting early retirement possibilities were most pronounced in corporatist and southern countries and least pronounced in liberal countries (see table 2).

Table 2: Changes of early retirement policies (positive = roll back; negative = new policy)

	Before 1999	After 1999
Social democratic		
Denmark	1	1
Finland	2	2
Sweden	1	-2
Corporatist		
Belgium	1	1
France	2	3
Austria	1	2
Liberal		
Ireland	0	0
United Kingdom	0	0
Southern		
Spain	0	n/a
Italy	1	4
Portugal	1	1

Source: OECD (2005) Economics Department Working Paper No. 429

The broad thrust of the changes has continued. The EC Green Paper on Pensions in 2010 maintained that one method of providing sustainable pension schemes was increasing the retirement age (European Commission, 2010). This has been accelerated in many countries as a result of government debt crises, which were a direct result of the Global Financial Crisis.

The European Commission has recommended the following measures to achieve the objective of creating more sustainable pension systems (European Commission, 2012, p.9):

1. Link retirement age with increases in life expectancy;

2. Restrict access to early retirement schemes and other early exit pathways;

3. Support longer working lives by providing better access to life-long learning, adapting work places to a more diverse workforce, developing employment opportunities for older workers and supporting active and healthy ageing;

4. Equalise the pensionable age between men and women;

5. Support the development of complementary retirement savings to enhance retirement incomes.

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Consistent with the above, many member states have increased pension ages, the norm gradually shifting from 65 to 67 years (see OECD, 2012; Eurofound, 2011). Increasing the pension age may not only be beneficial from a public expense point of view but also from a tax revenue point of view. For example, a recent study by Barrell *et al* (2011) for the UK estimates that an increase in the pension age will decrease public expenses, increase tax revenues and (possibly) also stimulate consumer spending because more income is generated by means of a longer working career. However, there are still countries with incentives to retire early. Eurofound (2011), in a study on the impact of the crisis, finds proof of some national companies using early retirement schemes to make older employees redundant.

Table 1 shows the extent to which retirement timing has actually changed over the last decade. From 2002 to 2011 there was an increase in labour force participation rates of the 55-65 age group in all member states. Although late retirement, as evidenced by participation rates among the 65-70 age cohort, is smaller than early retirement, it too has been growing in size. Even over a 10-year period, then, there has been a marked upward shift in average actual retirement ages, but with continued wide variability in retirement timing.

2. Drivers of the retirement timing decision

a) General factors

There have been numerous studies on the determinants of retirement timing: we draw on a recent study that focuses on extending the working life by Busch *et al* (2012). The factors mentioned are very similar to those from overviews of early retirement (see Wang and Shultz, 2010; Taylor, 2001). Busch *et al* (2012) come to the following general factors after reviewing the relevant literature. Taylor (2001) mentions a comparable general set of factors:

- Personal factors

- Family-related factors

- Work and organisation-related factors

- Socio-economic factors

Among personal factors related to the retirement decision is health, including not only work-disability or severe chronic illness, but also less severe chronic disorders all of which are associated with early retirement (Taylor, 2001, Busch *et al*, 2012). Other influences embrace those influences related to self-esteem or belonging to the working world. Busch *et al* (2012) also mention gender: women are more often keen to maintain the daily social interactions connected to work. Personal capabilities of older workers have also been found to be an influence, with those with higher levels of education may be at the top of their career during their fifties and may wish to delay retirement. Persons with high skill levels may also tend to want to continue working as they enjoy passing on their knowledge and skill (Busch *et al*, 2012).

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Family-related factors sometimes overlap with personal factors. Wang and Shultz (2010) conclude that married retirees might be able to adjust better to retirement than those not married. Enjoyment of interactions with people who share common work-interests on the workplace may be a factor leading many single people to stay in work as long as possible. With the collapse of relationships and the increase in one-person households in most countries, there will be a tendency for older individuals to continue participating in the labour market.

With regard to work and organisation-related factors, the atmosphere and identification with the company can be an important drive to keep working (Busch et al, 2012). Given the flexibility of the labour market and a rise in job mobility, there is less of an attachment to a particular employer and so retirement becomes more of an option for both parties. In this respect self-employment appears to have the opposite effects. On the one hand, those who have built up considerable investments may see this as providing them with the means to give up work, but, on the other, the level of personal autonomy may lead to working beyond the statutory retirement age.

Socio-economic factors comprise those variables that influence the retirement income. These include state and employment-related pensions, the availability of early retirement schemes and private wealth, including housing all of which impact on the ratio of pre- and post-retirement incomes (see Taylor 2001; Doling and Horsewood, 2003). An increase in household wealth, especially if it is unanticipated, increases the range of options available to individuals in their 50s. However, the ability to access the wealth depends upon the degree of liberalisation of credit markets.

b) *Home ownership factors*

There has been substantial research on the relation between liquid wealth on retirement timing, but only a few studies have explicitly considered the effect of home ownership on the retirement decision (see Farnham and Sevak, 2007; Zhao, 2011). Doling and Horsewood (2003) investigated the role of home ownership on early retirement in the 1990s using macro level data for a sample of western countries. They found that the home ownership rates and house price inflation were negatively related to labour market participation of older males. Subsequent studies have confirmed a role for home ownership in influencing the retirement timing decision. For the USA, Farnham and Sevak (2007) found evidence of housing wealth effects on retirement timing: a house price increase of 10% reduced the expected retirement age between 3.5 and 5 months. Zhao (2011) reached a similar conclusion. Research with 1995-2002 data for the Netherlands by Bloemen (2009) showed that housing value and mortgage debt are correlated with retirement timing. Bosworth and Burtless (2010) found a very small impact of house price change on the employment rate. In contrast, a study of the English housing market by Disney *et al* (2010) did not find a direct effect of house prices on retirement timing. One explanation for the different results is that expectations have a role to play and it depends upon whether the capital gains were expected and factored into their behaviour over a household's life cycle.

A short analysis of early retirement in Doling and Elsinga (2012) on a pan-European micro database, concluded that home ownership as such does not have a relation with retirement, but length of stay did. People who lived in the dwelling for a long time had a greater chance of early retirement while people who have just moved also had high odds of retirement. The latter case implies that people have just moved (traded down) to release equity, while the long-time stayers would often be outright owners who enjoy rent free housing and may have used this to retire early.

Surveys of people who explicitly said they use mortgage products to release housing equity for early retirement are scarce, partly due to the desire of the household to leave the family dwelling as a bequest to the next generation (see Doling and Elsinga, 2012). Moreover, these products are only available in Western European countries (Clerc-Renaud *et al*, 2010).

There has also been consideration of the possible impact of decreases in housing wealth on retirement planning. Just before the onset of the present crisis, Lusardi and Mitchell (2007) indicated that a major share of baby boomers' wealth holdings is tied to housing and they are therefore sensitive to house price declines. In the USA, the start of the crisis immediately sparked debate in the press about the effect of falling stock markets and house prices on the retirement decisions of Americans (see Coile and Levine, 2009; Odrich, 2010). Indeed, many American workers save for retirement on individual plans and may directly feel the negative impact of the current crisis in their stock and housing values. From this perspective, Bosworth and Burtless (2010) hypothesized that older workers possibly delay their retirement plans as a result of such losses, and Sass *et al* (2010) indicate that many near retirement Americans expect to have to work longer.

Influences on retirement timing emanating from housing can be expected to interact with the consequences arising from the present crisis. Individual workers who are approaching the statutory retirement age are less likely to opt for early retirement due to value of the stock of wealth being inadequate to fund their expenditure in retirement. Furthermore, the government cutbacks would encourage households to amass more wealth for the uncertainty that may lie ahead, especially in relation to what is provided by the state. Older workers may be inclined to work past the formal retirement age indeed, but during a crisis employers may not allow these people to keep on working if their companies have to slim down (see Bosworth and Burtles, 2010). Furthermore, older workers delaying retirement can have an adverse effect on the labour market entry of young people (Munell and Wu, 2012). Prior to the crisis, many home owners in western countries took out equity, often in order to refinance more expensive credit card debt or personal loans, but as house prices declined, many pre-retirement home owners are now unable to sell their house because of negative equity and see themselves forced to keep working in order to repay this debt (Wall Street Journal, 7 September 2011).

However, Munnell and Wu (2012) report no increase of unemployment for older workers from the start of the recession. In contrast, Odrich (2010) finds a weak effect of house prices and outstanding mortgages on retirement. However, he also points towards the sharp reduction of retirement rates in 2008, the first year of the crisis, when house prices and equity funds declined sharply. Coile and Levine (2009), who

explicitly took the popular debate as a starting point, also did not find hard evidence of house price fluctuations on retirement plans: they rather found that unemployment rates stimulate retirement.

3. Methodology

Our investigation of the impact of home ownership on the retirement timing decision in as many member states as possible involves the use of both micro (household level) and macro (country level) data. Our attempt to include as many factors cited in the literature overviews is limited by the available data.

a) Micro level

For the micro analysis we used the 2009 wave of Survey of Income and Living Conditions (SILC). The survey was conducted in 2008 when the financial crisis was just beginning to impact on most European economies. SILC contains personal and household information databases that can be merged. In general, it has sufficient cases for each country to justify multivariate analysis: Germany and Malta were excluded for unavailable data on at least one crucial variable (mortgage payments). Some caution has to be taken with using individual countries in a separate variable in combination with a number of personal (household) characteristics, because the cell counts can be small, especially at the 'working beyond retirement analysis'. However, we use country dummies in order not to impose cross European or regional effects on the personal factors.

In our analysis we selected the 55 to 64 age group for the early retirement analysis. Retirement before this age exists, but it is a rather small group. Formal retirement ages in some member states are before 65, but the details of the systems are not always clear. For example in France a retirement age of 62 is often cited but this is only possible after 40 years of work, resulting in many people retiring around 65 years. For the working past retirement analysis we selected persons aged 65 until 70 years; people above this age who are in paid work are relatively rare.

To give a more precise indication of actual early retirement, we excluded those people who said they were living on disability benefits as this is more forced retirement than a voluntary retirement. Also we excluded people who indicated they are homemakers. We only included those people who explicitly stated they were either working or retired.

We have used a basic logistic regression to estimate two models, one for the proportion of households on early retirement and the other for those working past the formal retirement age.

$$\ln\left(\frac{RETIRE_i}{1 - RETIRE_i}\right) = \beta_{0i} + \beta_1 HTENURE_i + \beta_2 HOUSE_i + \beta_3 MSTATUS_i$$
$$+ \beta_4 Age_i + \beta_5 Age_i^2 + \beta_6 CHRONILL_i + \beta_7 JOB_i$$
$$+ \beta_8 POVERTY + \beta_9 OINCOME_i + \varepsilon_i$$

where $RETIRE_i$ equals 1 if the individual is retired and 0 otherwise.

The general model considers as many factors as possible mentioned in the literature review on retirement timing decisions but emphasise housing-related determinants, for example housing tenure ($HTENURE_i$) and the size of the property ($HOUSE_i$). A second variant of the retirement model has net housing costs as a proportion of disposable income, $NHCOST_i$, replacing the housing tenure dummy variables. Net housing cost is defined as rent or mortgage interest payment minus any housing allowances or tax benefits and captures the proportion of contractual housing expenditure, rather than just being a renter, owner with a mortgage or an outright owner.

There are a number of other determinants considered in the general model. Firstly, there are the personal characteristics of the individual, for instance his age (AGE_i), marital status ($MSTATUS_i$) and health ($CHRONILL_i$). It was initial considered that both AGE_i and AGE_i^2 were included in the model to capture the increased probability of early retirement as the respondent approaches the formal retirement age. It may be that people are more likely to stop working two years before the official date. Likewise, for those working beyond retirement, there might be an optimal time to delay leaving the workforce, after which the probability of retirement increases sharply.

Whether the respondent is married might have an impact on the probability of early retirement, partly because it gives the retiree somebody to enjoy their newly found free time with. For those who have been through a divorce, the likelihood of stopping work early is lower as household assets have been divided, with the lawyers taking a share if the split was acrimonious. On the other hand, the probability for widowers will be higher as they had initially been saving to fund spending during retirement for two people. The death of a partner means that there is excess savings, some of which could be used by retiring early.

It is likely that ill health will have a negative effect on labour market engagement. There are various schemes in EU countries allowing people suffering from chronic illnesses to access disability benefits. Given the difficulties holding down a job in such circumstances, a number of those suffering from serious medical conditions will be retired early on the grounds of ill health.

While income might play a role, it is very hard to get a good measure as firstly incomes vary greatly across countries in the EU; those with a pension income will often have a lower income then those working (see for example Whitehouse 2007). As an alternative we use the "at risk of poverty factor": those with an equivalised household income at 60 per cent below the median household income. Those who are working and have an income below the risk of poverty line may well be working out of sheer need. On the other hand some retirees might choose for a below risk of poverty pension because they do not need much money for running large households with children anymore, while many have little housing cost because of outright ownership.

Having a source of non-labour income would be a key factor in the decision to stop working before accessing a pension. It would enable the person to cover the gap until drawing the pension. While there is no measure of the stock of assets in EU-SILC, the income from capital is recorded. Another revenue source from SILC is income from real estate: here it is income from rental of property or land. The greater the amount of non-labour income the greater the probability that the individual will have stopped work.

b) Macro level

The literature survey has highlighted various institutional factors that may be influential in determining the proportion of an age cohort remaining in the labour market. The advantage of macro-level analysis is that some of the country-specific determinants can be quantified and their impact on the timing of retirement to be examined.

The data set comprises 21 countries (Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Poland, Spain, Slovenia, Slovak Republic, Sweden and the UK) and covers the sample period 1993 to 2011. The selection of the EU countries to be included in the analysis was determined by data availability of the main variables of interest. A similar process was responsible for the sample period. As the proportion of an age cohort retiring early or working beyond the statutory age of retirement varies only slowly over time, the macro-level models were estimated using five-year and four-year averages, which related to various stages of the economic cycle.

Similar to the problems with the micro-level analysis, there is some debate as which age group should be the focus of analysis for early retirement. The problem is caused by the statutory retirement age differing between EU countries. In order to provide a general overview of the determinants of those leaving the workforce early, two sets of regression equations are estimated, one with the proportion of males aged 55 to 59 years of age who are active in the workforce as the dependent variable and the other focusing on males 55 to 64 years of age. The following general logistic model was employed to capture factors affecting the proportion of the 55 to 59 age cohort participating in the labour market:

$$\ln\left(\frac{PART5559_{it}}{1-PART5559_{it}}\right) = \beta_{0i} + \beta_1 \Delta\ln\left(\frac{M}{P}\right)_{it} + \beta_2 \Delta\ln\left(\frac{Ph}{P}\right)_{it} + \beta_3 PENS_{it}$$

$$+ \beta_4 SEMP_{it} + \beta_5 \Delta\ln\left(\frac{Pe}{P}\right)_{it} + \beta_6 ALMP_{it} + \beta_7 U_{it}$$

$$+ \beta_8 \Delta\ln Y_{it} + \beta_9 \ln\left(\frac{ASSET}{Yn}\right)_{it} + \varepsilon_{it}$$

where M denotes the total stock of outstanding mortgages and P the GDP deflator. The house price index, Ph, and the stock market index, Pe, enter the model as first differences as comparisons between EU countries cannot be made in terms of value. The size of the state pension as a proportion of GDP is captured by $PENS$. An alternative measure is given by government spending on the elderly in comparison to GDP, $OAPGOV$, with the major component being state pensions. The condition of the labour market is captured by unemployment, U, and the growth rate, $\Delta\ln Y$, where Y denotes GDP. The final potential contributing factor to early retirement is the accumulation of assets in an economy, $ASSET/Yn$ where Yn is nominal income.

A similar equation was used for modelling the participation of the broader age group, the 55 to 64 age cohort. However, it is realised that the estimated coefficients are likely to differ between the two groups of data, with some factors no longer being significant when including those individuals closer to the statutory retirement age.

A different set of factors are believed to influence the proportion of those over 65 years of age ($PROP65_{it}$) but who are still working in country i even though they are older than the statutory retirement age. The model for those who are delaying retiring is given by the general logistic equation:

$$\ln\left(\frac{PROP65_{it}}{1-PROP65_{it}}\right) = \beta_{0i} + \beta_1 LEXP_{it} + \beta_2 HO_{it} + \beta_3 \Delta\ln\left(\frac{M}{P}\right)_{it} + \beta_4 \Delta\ln\left(\frac{Ph}{P}\right)_{it}$$

$$+ \beta_5 PENS_{it} + \beta_6 SEMP_{it} + \beta_7 \Delta PTEMP_{it} + \beta_8 LTU_{it} + \beta_9 U_{it}$$

$$+ \beta_{10} ALMP_{it} + \beta_{11} MANUF_{it} + \beta_{12} \ln\left(\frac{ASSET}{Y}\right)_{it} + \beta_{13} \Delta\ln\left(\frac{Pe}{P}\right)_{it} + \varepsilon_{it}$$

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The decision to keep working beyond the official retirement age is different from that to retire early as a number of additional factors come into play, for example the life expectancy of a cohort (*LEXP*). Individuals, having based their based their savings decision in the belief that they would only be living an extra 10 years after retirement, find that an increase in life expectancy results in a choice. They could retire at the normal retirement age and reduce their expenditure or they could continue working and maintain their lifestyle.

A number of housing-related variables are considered to influence delayed retirement, for instance home ownership, *HO,* and capital gains, $\Delta\ln(Ph/P)$, both of which are thought to have a negative effect. However, the total stock of outstanding mortgages is a factor in persuading individuals to work even though they could pick up their pensions.

The size of the state pension, *PENS*, will be a determinant in the decision to keep participating in the workforce after the statutory retirement age. There is less of an incentive to keep on working if those retired receive a more generous payment. For those who have built up savings, the greater the wealth in a country, measure by the ratio of assets to nominal income (*ASSET/Yn*), the greater the likelihood that the elderly are retired. In a similar vein, increases in the growth of share prices are likely to discourage labour market participation.

The ability to keep working beyond 65 years of age depends upon the opportunities available. Some people might be interested to keep working but wish to reduce their number of hours. However, if the individual is self employed then he has the ability to choose how hard he works, suggesting that the proportion of self employment should contribute to those delaying retirement. The growth in part-time employment, $\Delta PTEMP$, is included in an attempt to capture this effect. The condition of the labour market will also restrict the person to gain employment after the age 65, factors proxied by unemployment (*U*) and long-term unemployment (*LTU*). The two other labour market factors are the proportion of manufacturing and active labour market policies implemented by the government.

4. Early retirement: Results

a) Micro level

We estimate models of early retirement using variables from the SILC database that match variables identified in the literature. The results from a logistic regression are given in Table 3, where the sample comprises males between the ages of 55 to 64 and the dependent variable is 1 if the respondent is retired and 0 otherwise.

Table 3: Dependent variable In(*RETIRE$_i$ /1-RETIRE$_i$*)

		1		2	
		Coeff	*t*-stat	Coeff	*t*-stat
HTENURE	Rent	-.277	-7.206		
	Mortgage	-.239	-5.708		
	(Ref = outright owner)				
HOUSE	Net housing costs			-1.003	-6.160
	Number of rooms	-.036	-3.043	-.033	-2.788
MSTATUS	Never married	.081	1.343	.097	1.559
	Married	.148	3.645	.164	3.911
	Widowed	.585	10.617	.618	10.783
	(Ref = divorced)				
AGE	*AGESQUARE*	.004	88.694	.004	87.399
HEALTH	Chronically ill	.574	22.162	.570	21.368
JOB	Legislator, senior official, manager	-.631	-10.726	-.620	-10.262
	Professional	-.586	-11.619	-.580	-11.155
	Technician and associate professional	-.037	-.756	-.041	-.814
	Clerk	.394	7.518	.377	6.979
	Service worker, shop and market sales worker	.080	1.562	.090	1.699
	Skilled agricultural and fishery worker	-.801	-12.861	-.824	-12.875
	Craft and related trades worker	.153	3.231	.167	3.414
	Plant and machine operators and assembler	.302	5.786	.304	5.649
	(ref elementary occupations)				
POVERTY	Poverty level	-.519	-11.912	-.534	-11.796
OINCOME	Income from capital	.737	4.543	.807	4.930
	Country dummies	Fixed		Fixed	
	Constant	-15.112		-15.380	
	Cox & Snell R Square	.345		.348	
	Nagelkerke R Square	.461		.464	

Source: EU-SILC 2009

Housing tenure position is an important factor in the decision to retire early. Home owners with an outstanding mortgage and renters are less likely to retire early. A credible explanation is that their housing costs, which will continue after retirement, effectively force them to maintain their income from work, or at least mean that, compared with an outright owner who lives rent-free, they need to have a larger pension. In the case of the mortgaged owner the continuing work status may reflect, like the tenant, a need to continue to meet high housing costs. Another possibility is that some owners have previously decided to repay their mortgage up to at least the formal retirement age, because they anticipated actually working up to that age. While it cannot be said, on the basis of our analysis, then, whether an outstanding mortgage is a cause or a consequence of the retirement timing decision, it is clear that, unlike outright owners, they do not have the same options of living rent free and of releasing housing equity, both of which may make it more feasible financially to retire early.

The number of rooms in the property is also included as an explanatory variable as it proxies the housing expenditure. The greater the number of rooms in the family residence the lower the probability that the person will be able to retire early. This factor will be picking up two forces. The larger the property the greater the housing costs, especially for items like heating and maintenance. This would mean that a larger pension is required to pay for the housing-related expenditure. Additionally, households in smaller properties might have downsized once the children have left home, partly with the aim to retire early.

The marital status appears to impact on the decision to leave the labour force before the statutory retirement age. Compared to a divorcee, the probability of retiring early for a bachelor is positive but insignificant. However, the effects become statistically significant for married and widowed individuals but the influences might be slightly different. In the case of a married man, he might want to take the opportunity to do other activities with his partner, for example travel. In the case of a widower, the plan would have been to accumulate savings to fund the spending of two people. With the death of the spouse, he now might have sufficient funds to retire before the anticipated date.

Age and ill health both have a positive influence on early retirement. The closer a person is to the formal retirement age the greater the probability that they will have stopped working. In simple terms, they have less time to cover the gap before private and public pensions can be drawn. If an individual is chronically ill it is unlikely he will be able to hold down a permanent job and he will have retired early, may be qualifying for such schemes as invalidity benefit.

Having sufficient funds to finance household expenditure before accessing a pension is a key factor affecting the possibility to retire early. Whether an individual then decides to make such a decision depends on a number of circumstances, most of which have been discussed above. If a household believes that it is in poverty then early retirement is not on the agenda. Alternatively, the greater the non-labour income then the more likely the individual has retired from the labour market.

The occupation dummies suggest that early retirement is a complex decision and it does not relate to just the nature of the employment. It appears as though the better educated are less likely to retire early, which may reflect that they have a more

demanding job or just that have been in the labour market for a shorter period of time. On the other hand, clerks and semi-skilled operatives appear not to work up to the retirement age. The finding of the latter group might have something to do with the loss of such jobs in the EU and the rise of the labour abundant developing economies.

Although the majority of variables are simple dummies capturing the housing position or the personal characteristics of males between the ages of 55 and 64, the models appear to explain a large proportion of early retirement in EU countries. However, more detail of the institutional features of the decision to stop working before the statutory retirement age can be captured by macro-level analysis within a panel framework.

b) Macro level

Table 4 presents four models using housing, wealth, labour market and general economic variables to explain the proportion of those males 55 to 59 still working.

Table 4: Dependent variable: ln($Part5559_{it}$ /1- $Part5559_{it}$)

	1		2		3		4	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	1.3528	4.3735	0.6323	2.0206	0.9712	2.1568	1.5239	4.5302
$\Delta\ln(M/P)$	0.0093	4.1426	0.0069	3.2397				
$\Delta\ln(M/Ph \cdot P)$					0.0013	1.6358		
$\Delta\ln(M/Ph \cdot Yn)$							0.0037	3.2433
$PENS$	-0.1409	-3.5963	-0.0434	-1.6110			-0.1271	-5.664
$OAPGOV$					-0.1453	-4.2816		
$SEMP$	0.0294	1.8435	0.0491	4.0156	0.0468	3.9271	0.0305	4.1822
$\Delta\ln(Pe/P)$	-0.0020	-1.4749	0.0002	0.0509	-0.0094	-2.7625		
$ALMP$	0.0874	2.4712	0.0412	0.8861	0.2030	2.0054		
$\Delta\ln(Ph/P)$	0.0032	1.3118						
U (%)			-0.0401	-8.8300				
$\Delta\ln Y$					0.0678	6.3588		
$\ln(ASSET/Yn)$							-0.3596	-7.034
Country effects	Fixed		Fixed		Fixed		Fixed	
Time effects	Fixed		Fixed		Fixed		Fixed	
Obs	58		59		55		61	
Adjusted R^2	0.9285		0.9636		0.9606		0.9499	
SER	0.1142		0.0834		0.0870		0.0974	

Variables:

M = Stock of total outstanding mortgages; P = GDP deflator; Ph = index of house prices; Yn = Nominal income; $PENS$ = Expenditure on public pensions as a percentage of GDP; $OAPGOV$ = Expenditure on the elderly as a percentage of GDP; $SEMP$ = Self-employment; Pe = index of equity prices; $ALMP$ = Active labour market policies; U = Unemployment rate; Y = GDP; $ASSET$ = Stock of assets.

Table 4 presents a number of equations illustrating the factors responsible for the participation in the workforce of males aged 55 to 59 years of age. Preliminary work found that home ownership *per se* did not encourage individuals to drop out of the labour market, contrary to Doling and Horsewood (2003). Instead the effect of the housing market on participation in the labour market was more complex and incorporates the stock of mortgage debt in an economy. Equation 1 includes the growth of the stock of real mortgage debt as an explanatory variable, which has a positive effect and is statistically significant. However, the growth of real house prices has a positive influence on the proportion of males in their late 50s who are still working, which would suggest that they did not view the family home as part of their nest egg, which can be cashed for retirement. The coefficients indicate that the proportion of GDP paid as pensions by the government has a discouraging effect on individuals from working after the age of 55. Likewise, an increase in household wealth, via growth in real equity prices, encourages early retirement. It should be noted that the stock market boom might influence the decision to retire via private pensions, which tend to be paid for by investments in equities. However, pension funds tend to adopt a global perspective when investing and are not tied to national stock markets. The other two variables in equation 1 are the measure of active labour market policies and the proportion of the self-employed, both having a positive impact on labour market participation. For a number of reasons, being your own boss is thought to give individuals greater pleasure than being just a cog in a machine, even though the responsibilities may be considerably greater. There is also the added advantage that the self-employed in general have more flexibility over their time and so they may keep working in their late 50s but slow down. The effect of active labour market policies indicates that schemes to keep individuals working, which may be retraining, achieve their desired goal.

The main difference with Equation 2 is the addition of the unemployment rate as an explanatory variable, which captures the impact of job losses on early retirement. If made unemployed in their late 50s, it becomes hard to gain another job so individuals may declare themselves early retired. Equally, some firms will introduce very generous voluntary redundancy packages which could provide the finances for an individual to live off until the statutory retirement age. As expected the rate of unemployment has a highly significant negative impact on the participation of elderly males in the labour market. Its inclusion leads to the coefficients on the real growth of share prices and the measure of active labour market policies becoming insignificant. A similar effect was found with the real growth of house prices and so this variable was dropped from the regression.

Equation 3 contains a number of modifications from the previous versions of the participation equations. Firstly, the mortgage variable was adapted to take into account the increase in house prices, becoming the growth in real indebtedness in the housing market ($\Delta \ln(M/Ph\cdot P)$). However, this transformed housing variable did not have a significant impact on early retirement. Secondly, the public pension-GDP ratio (*PENS*) is replaced by government expenditure on the elderly, which is a broad measure of state provision in retirement as it includes health related spending. The impact appears similar to the coefficient on *PENS* found in equation 1. Stronger influences were found for self-employment, the growth of real share prices and active

labour market policies. The third modification was to include the growth of real GDP rather than unemployment as an indicator of the state of the economy in each EU country. Again the result is consistent with economic intuition, indicating that fewer elderly workers leave the labour market if there are job opportunities available.

The final equation presented in Table 4 is a more parsimonious version, highlighting the key factors behind the decision by males aged 55 to 59 to keep working. The impact of the housing market comes through the growth of indebtedness in relation to income, which is an indication of the sustainability of borrowing for house purchase. The positive coefficient shows that an increase in indebtedness removes the possibility of homeowners from taking early retirement. An opposite force comes through the size of the state pension. An increase in the generosity of the payment once statutory retirement has been reached leads individuals to contemplate leaving paid employment at an earlier stage. This argument is reinforced by the inclusion of the stock of assets to GDP as a separate explanatory variable. Part of a person's accumulated wealth, which would have been used to fund expenditure in planned retirement, so any unexpected increase may lead the elderly males to stop working at a younger age.

The factors affecting the labour market participation of males aged 55-64 should be relatively similar to the 55-59 aged cohort, although the addition of those close to retirement may reduce some of the effects. One explanation for presenting the second set of results is to analyse the same age group as those examined using the micro level data. The results for the proportion of males aged between 55 and 64 years of age are given in Table 5.

Table 5: Labour market participation of male workers aged 55 to 64
Dependent variable: ln($Part5564_{it}$/1- $Part5564_{it}$)

	5		6		7		8	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	0.4406	1.8316	0.4632	1.1944	0.9837	1.8183	1.0745	1.8906
Δln($M/Ph \cdot Yn$)	0.0077	2.8226	0.0082	2.7097	0.0049	2.7776	0.0103	4.9891
PENS	-0.0666	-1.6636						
OAPGOV			-0.0707	-1.1666	-0.1405	-2.2000	-0.1580	-2.3122
SEMP	0.0415	4.1561	0.0427	4.2161	0.0311	2.3599	0.0342	2.4173
Δln(Pe/P)	-0.0057	-2.4590	-0.0069	-2.8969			-0.0070	-3.8606
ALMP	-0.0673	-2.6702	-0.0640	-2.1023	-0.0473	-1.2033	-0.0036	-0.1753
ln($ASSET/Yn$)	-0.1761	-2.2653	-0.1810	-2.2304	-0.2247	-1.8548	-0.2032	-1.6952
U (%)	-0.0300	-3.7895	-0.0308	-3.8460				
Country effects	Fixed		Fixed		Fixed		Fixed	
Time effects	Fixed		Fixed		Fixed		Fixed	
Obs	56		56		57		56	
Adjusted R²	0.9688		0.9680		0.9531		0.9526	
S.E.R	0.0787		0.0797		0.0976		0.0971	

See Table 4 for list of variables

Growth of housing indebtedness is a significant feature in all versions of the equations on the labour market participation of the 55 to 64 male cohort. There is strong evidence to suggest that people are restricted in their choices if they have accumulated a large amount of debt. Early retirement is not an option if the drop in income is sufficiently large that they will be unable to keep up the mortgage payments. While home ownership provides certain benefits to a household when house prices increase, the associate mortgage debt can result in individuals going against their desires and working up to the statutory retirement age.

5. Late retirement: Results

a) Micro level

With the same explanatory variables as in the early retirement analysis, it is to be expected that the coefficient signs would change. For example, chronic illness should now show a negative sign because the odds of working past retirement can be smaller to those in good health. First of all it should be clear that vast majorities of the persons in EU-SILC within this age group are actually retired, making the possibilities of finding significant differences per personal characteristic smaller overall (see Appendix II).

The housing variables are less significant than in the early retirement analysis. Renters have lower odds of working past the retirement age, while there is no significant difference between outright and mortgaged owners. As opposed to early retirement, housing cost does not play a significant role. Those with more rooms in the house have higher odds of working past retirement due to higher housing costs.

The other personal and household level variables are all significant. All signs show the same patterns like in the early retirement analysis. Age is significant, while chronic illness is also important. Like in the early retirement analysis, the professional occupation plays a role. Especially legislators, managers and (senior) professionals and agricultural workers have higher odds of working past retirement. The former group continue working as they possess unique abilities and are difficult to replace, Wwhereas those involved in agriculture tend to live in the countryside and help out at various times in the seasons.

Those who work beyond 65 years have smaller chances of being at risk of poverty: an indication that they do not do so out of sheer need, but the relation may be more complex. In fact those who are retired have higher poverty risk: it is not clear if those persons would rather work or can get by on relatively low income levels. Other income factors are not always relevant: income from real estate is not significant at all, but income from capital is.

The country dummies follow the retirement patterns found throughout Europe (see Appendix II). Institutional differences are another explanatory layer, which is analysed in the macro study, including changes over time.

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Table 5 Late retirement: micro analysis

		1		2	
		Coeff	t-stat	Coeff	t-stat
NHCOST	Net housing cost			.116	.326
HTENURE	Rent	-.199	-2.259		
	Owner mortgage	.065	.596		
	(Ref = outright owner)				
HOUSE	Rooms in house	.076	3.060	.099	3.943
MSTATUS	Never married	-.452	-3.273	-.512	-3.546
	Married	-.379	-4.200	-.350	-3.784
	Widowed	-.589	-5.499	-.578	-5.237
	(Ref = divorced)				
AGE	AGESQUARE	-.002	-13.205	-.002	-12.784
HEALTH	Chron_ill (YES)	-.644	-11.441	-.658	-11.389
JOB	Legislators senior officials managers	.636	5.891	.639	5.776
	Professionals	.568	5.707	.541	5.270
	Technicians and associate professionals	.006	.052	.011	.096
	Clerks	-.463	-3.576	-.456	-3.455
	Service workers, shop and market sales workers	-.015	-.130	-.017	-.146
	Skilled agricultural and fishery workers	.892	8.073	.939	8.281
	Craft and related trades workers	-.473	-4.195	-.464	-4.009
	Plant and machine operators and assemblers	-.527	-4.219	-.572	-4.413
	(Ref = elementary occupation)				
POVERTY	Poverty level (YES)	.826	9.046	.814	8.658
OINCOME	Income from capital	-.677	-1.952	-.702	-2.000
	Income from real estate	.038	.102	.097	.262
	Country dummies	Fixed		Fixed	
	Constant	5.796	10.004	5.593	9.474
	Cox & Snell R Square	.084		.086	
	Nagelkerke R Square	.200		.204	

Source: EU-SILC 2009, OTB calculations

b) Macro level

In the first of the four models presented in Table 6, the home ownership rate is statistically insignificant. Measures of the growth in mortgage debt, related to GDP and inflation, were significant and positive indicating that higher levels of indebtedness are associated with an incentive to work beyond the statutory retirement age. As with early retirement it is not clear whether mortgage debts ties people into the labour market requiring them to work longer, or their ability to keep working earlier informed a decision to carry on repaying a mortgage after the formal age of retirement.

Table 6: Late retirement: macro analysis

	1		2		3		4	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
C	-7.8343	-2.0375	-8.5391	-2.7596	-7.0888	-3.0361	-6.4017	-3.0709
LEXP	0.3516	1.7396	0.3741	1.8867	0.3028	1.9752	0.2701	2.0177
HO	0.0041	0.2425						
$\Delta\ln(M/Ph)$	-0.0064	-0.5952						
$\Delta\ln(M/Yn)$			0.0282	2.1921				
$\Delta\ln(M/P)$					0.0275	2.7015	0.0372	3.0708
PENS	-0.1839	-2.6304	-0.1410	-2.5388	-0.1771	-3.4369	-0.2504	-3.2010
SEMP	0.0377	1.0906	0.0373	1.6460	0.0539	2.6054	0.0623	2.6575
$\Delta PTEMP$	0.1013	2.4090	0.0566	2.4928	0.0730	3.2160	0.0922	3.6612
MANUFACT	0.0063	0.2195						
LTU	0.0039	0.4092	0.0096	1.4267				
U	-0.0298	-1.0483	-0.0229	-1.2330				
$\Delta\ln P$	-0.0560	-0.9585						
ln(ASSET/Y)					-0.1372	-0.5109		
$\Delta\ln(Pe/P)$							-0.0197	-1.5347
ALMP							0.2511	1.6118
Obs	53		62		64		59	
Adjusted R^2	0.9475		0.9476		0.9505		0.9563	
SER	0.1775		0.1697		0.1669		0.1622	

Variables: See Table 3 plus

LEXP = Life expectancy; *HO* = Home ownership rate; *PTEMP* = Part-time employment; *MANUFACT* = Proportion of manufacturing; *LTU* = Long-term unemployment

An increase in life expectancy at the age of 60 has a positive effect on the proportion of males working beyond the statutory retirement age, which may be explained by a miscalculation of the stock of savings required to fund their expenditure during retirement. However, the two measures of wealth, the ratio of assets to income and the growth of the stock market index, were not statistically significant. Therefore, it is

more likely that a rise in life expectancy leads to people continuing to work because they want to continue to be active.

Whereas unemployment did not have significant coefficients, self employment did; the positive coefficients suggesting this aspect of labour markets is important in promoting working beyond the formal retirement age. The change in part-time employment also appeared to have an influence, which indicates that older people are keen to keep active but do not want to face the demands of full-time employment. Having a part-time job for those over the age of 65 years of age provides some "top-up income" and source of camaraderie, giving a gradual transition to retirement.

Pension spending produced significant and negative coefficients throughout all models: those countries with more generous systems have fewer people who work past 65 years. In contrast, the existence of active labour market policies did not appear to influence late retirement behaviour.

Conclusions

This study has not sought to explore fully all the possible factors influencing the decision made by European workers relating to the timing of their retirement relative to the age specified by national pension entitlements. Rather, it has focused primarily on the potential role of housing, albeit acknowledging and incorporating other factors in the models in order to reduce the effect of their interactions with housing. This has enabled the identification of the impact of housing on the retirement timing decision, taking other impacts into account.

The role of housing on the retirement decision in Europe has not been widely investigated. Moreover, while acknowledging the shift in the recent debate from early retirement to working past retirement (65 years), policy changes can take time and it is evident that throughout Europe, many households in the ages before 65 are retired. The role of home ownership in the American retirement system, with more emphasis on building private wealth, has attracted immediate attention after the onset of the crisis.

The study started from the findings of previous research by Doling and Horsewood (2003), but supported by a number of more recent studies located empirically mainly in the US and Europe, that indicated that home ownership has been a factor influencing the retirement timing decision. At the level of the individual worker home ownership is significant because, provided it is owned outright, it enables him or her both to live rent free and thus get by on a smaller pension than required by a rent-paying tenant, and to realise an income by drawing on some or all of the housing equity. In short, outright ownership of a home facilitates giving up a wage income and thus early retirement.

However, over the last decade two major developments have impacted on this relationship. Firstly, what had become a widespread early retirement culture, particularly marked in some member states and supported by policy initiatives to ease economic restructuring, has been addressed by governments now concerned

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increasingly by pension commitments. The general shift has been toward encouraging people to extend the working life and current, age-related participation rates for both a reduction in early retirement and a growth of late retirement. Secondly, the re-orientation of policy has been underlain by the post 2007 economic crisis which has not only heaped additional economic and fiscal challenges on member state governments but also aspects of home ownership, including falling prices, that affect its ability to support the retirement timing decision.

In the present study the use of both micro and macro data sets has enabled the identification of the determinants of the retirement timing decision – be that early or late relative to the national retirement age - at the levels both of the individual, that is personal characteristics, and of the national contexts. While there are some discrepancies in the results about the role of homeownership on the timing of retirement from aggregate and disaggregated data sets, it must be recognised that the two approaches are capturing different parts of the general picture. Furthermore, and notwithstanding the wide scope, in practice both macro and micro data sets are restricted in the variables available. EU-SILC, for example, does not contain variables measuring the net wealth or housing wealth of individuals, nor the relationship between pre and post-retirement incomes.

A number of the findings from the study are directly relevant to the NEUJOBS agenda. The reduction in the proportion of member state populations that retire early and the increase in the proportion that retire late are at least consistent with the shift in public policies. The statistical significance attached to variables measuring the welfare regime type, the generosity of pensions and the presence of active labour market policies, as well as the time effects all lend weight to a conclusion that policy matters to the extent that governments are able to bring about changes at least in this aspect of the supply of labour.

Further, there appear to be important links between retirement timing and housing. People who are outright owners of their homes are most likely to retire early, while those who own but have a mortgage or who are tenants are less likely to do so. This is consistent with the ability of outright owners to live with low housing costs and to draw upon housing equity as a source of income.   The micro analysis also demonstrated that not only are owners with mortgages least likely to retire early they are most likely to retire late. The macro results are consistent with this: participation rates for 55-59 year olds and for 65-70 year olds are highest in countries with high growth of mortgage debt. It is not clear from the analysis whether mortgage debt ties people into labour market participation or access to mortgage finance is predicated on a decision to retire late anyway. Nevertheless it leads to a conclusion that the objective of increasing labour supply by extending the working life is dependent in part on developments in mortgage markets. If these do not recover to levels attained by 2007 and 2008, when the financial crisis began to kick-in, it may be all the harder for governments to achieve their working life targets.

Care must be taken when considering the policy implications from the estimated models, however. The models analyse the influence of key variables over time in the various member states, some of the changes were foreseen and other were unexpected. For those that were unexpected, there will be a revision in the timing of retirement by

those household approaching or in retirement. From a macroeconomic perspective, should a government wish to reduce the probability of a person taking early retirement, and thereby contribute to an increase in the working life of the population generally, a number of policy options are available. In the short run, a decrease in spending on the elderly would have a large impact; a similar effect could be achieved by a reduction in the state pension. Both measures are part of the austerity measures being introduced across member states and we would consequently anticipate a decline in the rate of early retirement.

In the medium term, encouraging self-employment would provide some workers with the incentive to avoid dropping out of the workforce before the statutory retirement age. It is unlikely that such a change could be implemented quickly due to issues relating to the attitude of workers and the risks involved.

As can be seen from the size of the estimated coefficients, the impact of the housing market on the proportion opting for early retirement, although statistically significant, is of a secondary magnitude. The effect comes from household indebtedness and the size of the stock of outstanding mortgages might be the only variable that could be controlled by government regulation. It should be noted that the macro participation equations combine level effects, for example pensions, and growth effects, such as the percentage change of housing equity. The reason for such a mixed approach is due to data availability. To be more specific, house prices are only given in index form, which makes it impossible to calculate a measure of housing equity. As a result, a variable capturing changes in indebtedness have been derived from a restricted version of the general model.

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Appendix I Data units and sources for the macro analysis

	Variable	Unit	Source
PART5559	Proportion of males aged 55 to 59 working	Proportion	OECD
PART5564	Proportion of males aged 55 to 64 working	Proportion	OECD
PART65	Proportion of males over the age of 65 working	Proportion	OECD
U	Unemployment rate	%	OECD
Ph	House price index	Index	EMF
M	Stock of outstanding mortgages	Billions euros	EMF
Yn	Nominal GDP	Billions euros	OECD
Y	Real GDP	Billions euros (2005 Prices)	OECD
P	GDP deflator	Index	OECD
ASSET	Stock of assets	Billions euros	OECD
OAPGOV	Government spending on the elderly as a percentage of GDP	%	OECD
PENS	Public expenditure on pension as a percentage of GDP	%	OECD
SEMP	Percentage of self employment	%	OECD
P_e	Stock market index	Index	OECD
Loans	Stock of loans	Billions euros	OECD

NEUJOBS

Appendix II Summary from SILC 2009 database: selection only persons who indicate they either work or are retired (excluding homemakers or on disability-illness benefits).

		Work	Retired		Work	Retired
Corporatist	Austria	36%	64%		3%	97%
	Belgium	47%	53%		2%	98%
	France	39%	61%		1%	99%
	Luxemburg	49%	51%		2%	98%
	Netherlands	73%	27%		10%	90%
Southern	Cyprus	70%	30%		13%	88%
	Spain	70%	30%		5%	95%
	Greece	58%	42%		6%	94%
	Italy	45%	55%		7%	93%
	Portugal	57%	43%		5%	95%
Social democrat	Denmark	67%	33%		7%	93%
	Finland	75%	26%		5%	95%
	Sweden	79%	21%		10%	90%
Eastern	Bulgaria	53%	47%		6%	94%
	Romania	30%	70%		7%	93%
	Czech Republic	48%	52%		6%	94%
	Slowakia	41%	59%		2%	98%
	Hungary	41%	59%		4%	96%
	Slovenia	27%	73%		1%	99%
	Estonia	71%	29%		21%	79%
	Lithuania	63%	37%		9%	91%
	Latvia	61%	39%		19%	81%
	Poland	39%	61%		6%	94%
Liberal	Ireland	81%	19%		30%	70%
	UK	73%	27%		24%	76%