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## **ABSTRACT**

### **Announcing an Increase in the State Pension Age and the Recession: Which Mattered More for Expected Retirement Ages?**

In March of 2010, the Irish government announced that the age at which the state pension is paid would be raised to 66 in 2014, 67 in 2021 and 68 in 2028. Also during 2010, the economic news became increasingly bad as the full scale of the fiscal and banking crises in Ireland emerged. The question we address in this paper is whether expected retirement ages of Irish individuals aged 50 to 64 changed as a result of the policy announcement and/or the bad economic news. The data we use are from the Irish Longitudinal Study on Ageing (TILDA). Between late 2009 and early 2011, over 8,500 people aged 50 and over in Ireland were interviewed about a wide range of issues including standard socio-economic items such as labour force status, earnings and education. Respondents were also asked at what age they expected to retire. Our findings show that there was no noticeable break in expected retirement ages before and after 3 March 2010 (the day on which the policy announcement was made). However, there was a clear shift of people into the categories “don’t plan to retire” and “do not know” before and after September 30 2010. This was the day that the full scale of the banking crisis emerged (named by the media as “Black Thursday”) and was followed by the set of events which led to the bailout of November 2010. Similarly, there was a shift away from modal expected retirement ages after that date.

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## **1. Introduction**

Population ageing is a feature of many countries and the challenges which arise as a result of this demographic trend are increasingly discussed in the health and economics literatures. Within economics, much of the discussion has focused on the long-term pressures on the public finances that will be experienced as the population structure shifts towards those who are aged 65 and over and away from those who are in the “standard” working age bracket. The possibility of a public pension time-bomb is probably the most familiar concern.

In order to deal with these growing pension pressures, many countries have announced reforms to their public pensions systems. In March 2010, the Irish government announced that the age at which the state pension is paid would be raised to 66 in 2014, 67 in 2021 and 68 in 2028. One goal of this policy is to contain spending on social welfare pensions in the coming years. Another goal would be to provide an incentive for people to remain in the labour force beyond the age of 65, thereby increasing labour supply and national output. The reason for pre-announcing the policy is to provide people with time to adjust their expected paths of work and retirement.

The question which we address in this paper is whether or not people in Ireland adjusted their expected ages of retirement in response to the announcement of the raising in the state pension age. We use data from the Irish Longitudinal Study on Ageing (TILDA). As the fieldwork for the TILDA data collection was conducted between late 2009 and early 2011, we have observations on random samples of Irish people aged 50 and over before and after the announcement of the policy. Of course, the Irish economy suffered severe difficulties over this period. As a result, we are also able to assess if people altered their expected retirement ages in response to the recession. We can then compare the effects of the policy announcement and the recession.

The paper is structured as follows. In Section 2, we discuss the literature in this area. In Section 3, we highlight the key features of Ireland’s pension system. In Section 4, we describe the data. The methods used in the analysis are outlined in Section 5, with the results following in Sections 6 (descriptive) and 7 (regressions). We conclude in Section 8.

## **2. Literature review**

In this section, we review two different strands of the literature which are relevant for our paper: i) the impact of pension policy reforms on retirement expectations and ii) the impact of macroeconomic changes, e.g. economic booms or busts, on retirement expectations.

Focusing first on the impact of policy reforms on expectations, a limited number of studies have investigated whether individuals alter their retirement expectations in response to pension policy reforms. In Europe, evidence has been collected in Italy and Germany (Brugiavini 1999; Mastrogiacomo 2004; Bottazzi et al 2006; Boeri and Brugiavini 2009; Coppola and Wilke 2010).

Brugiavini (1999) investigated whether Italian individuals responded to the 1992 pension reform by comparing retirement expectations in 1991 and 1993. She found that Italian individuals decreased their expected retirement age, although the reform increased the mandatory retirement age. Brugiavini (1999) argued that the debate on early retirement initiated by the reform shifted the attention of Italian workers on the issue of early - rather than normal - retirement. Mastrogiacomo (2004) found that in the period 1989 to 2000, the expected retirement age of Italian individuals increased by more than two years. Similar

conclusions were drawn by Bottazzi et al (2006), who found that both Italian men and women altered their retirement expectations in response to the whole set of reforms that took place in Italy in the 1990s (a delay of two years for men and three years for women). Bottazzi et al (2006) also found that those who altered their expectations the most were those who had better knowledge of the social security system.

In Germany, Coppola and Wilke (2010) studied the effects of the increase in state pension age from 65 to 67 years introduced by the 2007 reform. Coppola and Wilke (2010) found that less productive workers living in relatively wealthier households were more likely to plan an early retirement. The results of the econometric model employed in the paper showed that the introduction of the pension reform motivated better educated male workers to remain longer in the labour force. However, weaker results were found for women.

Turning then to the impact of macroeconomic changes on both retirement expectations and actual exit from the labour market, evidence has been collected in the US (Sevak 2002; Gustman et al 2009; McFall 2011). This strand of the literature investigates whether the timing of retirement responds to unexpected changes in wealth. The longitudinal nature of the Health Retirement Study and of other longitudinal surveys targeted at older people has been exploited to investigate whether older people alter their retirement expectations during an economic boom or bust.

In the 1990s, many households experienced large capital gains in the US. Using data from the 1992 to 1998 waves of the Health and Retirement Study, Sevak (2002) found that a positive wealth shock of \$50,000 would lead to a 1.9% point increase in retirement probability among individuals aged 55 to 60. She also found that the elasticity of retirement flows between 1996 and 1998 with respect to wealth was in the magnitude 0.39-0.50 for men.

Gustman et al (2009) used data from the 2004 and 2006 waves of the Health Retirement Study and focused their analysis on people aged 53 to 58 in 2006 - the 'early boomers'. Gustman et al (2009) argued that older people are – on average – not very sensitive to changes in stock and housing prices given that the majority of the elderly have only a small proportion of wealth in stocks, have already repaid their mortgages and do not plan to sell their houses in the imminent future. The results of the simulations of the structural retirement model employed in the paper showed that the stock market decline which has affected the US in recent years would lead the early boomers to postpone retirement by only 1.5 months on average.

More recently, McFall (2011) investigated the impact of wealth losses experienced by American older individuals in the pre-crash (2008) to post-crash (2009) period on retirement expectations. McFall (2011) found that most individuals did not adjust their planned retirement ages between 2008 and 2009. He provided two possible justifications for this finding: i) many individuals did not lose large amounts of wealth in the crash so did not need to adjust their expectations; ii) people were in general reluctant to change their expectations due to 'emotional costs of changing plans, effort costs to reoptimize retirement decisions, and/or rigidities in employment relationships and pension rules' (p. 42). These findings are in line with another strand of the literature which shows that - in general - once individuals have formed rational retirement plans, they stick to them and respond as expected to unanticipated changes in circumstances (Bernheim 1989; Dwyer and Hu 1999; Benítez-Silva and Dwyer 2002, 2003; Dwyer 2001 and Cobb-Clark and Stillman 2009). Turning to the results of the econometric model, Mcfall's preferred specification showed that respondents adjusted retirement age by an average of only 8.4 percent of the change that would be needed to

maintain pre-crash sustainable consumption levels after the crash. This translates in an increase in expected retirement age of approximately 2.5 months. The adjustment increases to 15.4% for those who are pessimistic about the stock market.

In Europe, Bissonnette and van Soest (2011) have investigated the expectations of the Dutch population aged 25 and above concerning the future generosity of state and occupational pensions. They used monthly data for the time period May 2006 to September 2010. The dataset is particularly well-suited because the Netherlands have been affected by a financial and economic crisis in the recent past – although to a lesser extent than Ireland. The expectations questions used in their survey are different from the ones employed in the Health Retirement Study or TILDA. For example, respondents are asked to state the probability that in 10/20 years from the present the age at which people will be entitled to old age social security benefits will be – on average – higher, at least two years higher, lower, at least two years lower than in the present. Respondents are asked to think about “the average Dutch person”, not about themselves directly. Bissonnette and van Soest (2011) found that the average reported probability that the eligibility age would increase over the next 10 years rose from about 60% in May 2006 to 70% in summer 2009 to 75% in summer 2010. Bissonnette and van Soest (2011) also investigated whether expectations were different for different socio-economic groups. They concluded that those who were better informed or more “financially literate” (e.g. highly educated, high earners, living with a partner) were more likely to expect that the age at which people will be able to retire would increase.

### **3. The Irish Pension system and the pension reform**

At present, the pension system in Ireland comprises two main elements. The first is the state-run Social Welfare system; the second comprises voluntary supplementary pensions provided through a number of arrangements and regulated by the State.

The first pillar consists of two types of payments: a) state pension (contributory), paid to people aged 66 and above who have made sufficient social insurance contributions; and b) state pension (non contributory) which is financed through general taxation, is means-tested and is paid according to need from 66 years of age. Although the state pension (contributory) is paid from age 66, individuals are entitled to the state pension (transition) when they reach age 65, provided that they have paid enough contributions. The state pension (transition) is paid only for one year and individuals are then automatically transferred to state pension (contributory) when they reach age 66. This means that, in practice, those who have paid enough social insurance qualify for the state pension at age 65.

The second pillar comprises voluntary supplementary pensions which can take the form of pensions sponsored by the employer (occupational pension schemes), or personal pensions such as Retirement Annuity Contracts (RACs) and Personal Retirement Savings Accounts (PRSAs). The two standard types of occupational pension schemes offered in Ireland are defined benefit and defined contribution schemes. Defined benefit schemes provide the employee with a pension “promise” of a certain percentage of an employee’s final salary. Defined contribution schemes offer a pension determined by the level of contributions invested into a fund, its investment performance and the charges levied.

On 3 March 2010, the Irish government announced that a number of significant changes will be made to the Irish pension system in the near future. In particular, the government announced that the State pension age will rise to 66 in 2014, 67 in 2021 and 68 in 2028. This implies that the reform will affect those born on 1 January 1949 or onwards. Under the old legislation, those born in 1949 would qualify for the state pension (transition) at age 65 in

2014. With the new rules, they will directly qualify for the state pension (contributory) at age 66 in 2015. In other terms, the first change introduced by the reform implies the abolition of the state pension (transition). The minimum qualifying state pension age will be 66 for those born between 1 January 1949 and 31 December 1954; 67 for those born between 1 January 1955 and 31 December 1960 and 68 for those born on or after 1 January 1961.

The reform was announced on 3 March 2010 and the news was covered in the media.<sup>1</sup> There was basically no discussion in the media about the reform in the months preceding the announcement of the reform. The reform became law on 29 June 2011, with the publication of the Social Welfare and Pensions Act 2011. The reform also introduced other changes, including a new mandatory or 'auto-enrolment' pension scheme.<sup>2</sup>

#### **4. Data**

Data from the first wave (2009/2010) of The Irish Longitudinal Study on Ageing (TILDA) is used. This is a study of people aged 50 and over (and their spouses or partners of any age) resident in Ireland. TILDA collects detailed information on all aspects of the respondents' lives, including the economic dimension (pensions, employment, living standards), health aspects (physical, mental, service needs and usage) and the social domain (contact with friends and kin, formal and informal care, social participation). The study is closely harmonised with leading international research (e.g. The English Longitudinal Study of Ageing (ELSA); the Survey of Health, Ageing and Retirement in Europe (SHARE) which is pan-European, and the Health and Retirement Survey (HRS) conducted in the United States).

TILDA is made of three components: the computer-aided personal interview (CAPI) questionnaire; the self-completion questionnaire (SCQ), designed to explore certain areas that were considered particularly sensitive for respondents to answer directly to an interviewer; and the health assessment component of the study, conducted both in dedicated TILDA health assessment centres and, alternatively, in respondents' homes. The health and functioning measures collected in the CAPI interview and by the self completion questionnaire are self-reported (with the exception of a number of memory and cognitive function tests). The health assessment complements the CAPI and self-completion questionnaires by adding a range of objective measures of health status and functioning. The first wave of TILDA includes 8,504 respondents for the CAPI questionnaire, 7,191 for the SCQ and 6,153 for the Health Assessment.

In the CAPI questionnaire, individuals are asked to specify at which age they plan to retire. Individuals can also state they do not plan to retire, they do not know when they will retire or can refuse to answer this question. The question is asked to employees, self-employed, unemployed and those in education or training.

TILDA fieldwork spanned from 18 October 2009 to 22 February 2011. During this period, different events occurred in Ireland: it was announced that the state pension age would be increased and the bad news about the Irish fiscal and financial situation became progressively worse, peaking in the last quarter of 2010. This makes TILDA a particularly well-suited data source to use to investigate if the pension policy changes and/or the bad economic news have

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<sup>1</sup> It was covered on TV (e.g. RTE news), radio (e.g. Morning Ireland) and newspapers (e.g. Irish Times) on 3 / 4 March 2010.

<sup>2</sup> In the future, workers aged 22 and above who are not already covered by a pension scheme through their employer will automatically be enrolled in a new supplementary pension scheme. Employees will be able to opt out of the supplementary scheme, but they will automatically be re-enrolled every two years.

had an impact on Irish older people's expectations as when to retire. Our paper is different from the papers discussed in the literature review because it enables us to look at different events simultaneously and to compare the magnitude of the effects of the different events on retirement expectations. The nature of our data is cross-sectional so – in contrast to the US studies - we are not able to directly determine if TILDA respondents have suffered a decline in wealth. However, TILDA data allows us to investigate if people's retirement expectations have changed in a particularly difficult and challenging period for Ireland. This is equally interesting.

## 5. Methodology

We focus our analysis on individuals aged 50 to 64 who are showing some degree of attachment to the labour market and are in: i) employment (employees or self-employed); ii) unemployment; or iii) education or training. We are left with 2,234 observations. We model expected retirement employing a multinomial logit model which identifies five categories of responses to the question on the age at which people expect to retire: age 50 to 64 (base category); 2) age 65; 3) age 66+; 4) do not plan to retire; and 5) do not know.

The decision to include categories 4) and 5) is based on the following rationale. As Cobb-Clark and Stillman (2006) point out, analyzing data on subjective expectations can be methodologically challenging, “because these questions can be difficult to conceptualize leading many respondents to explicitly refuse to answer or to reply that they do not know” (p. 2). Some early papers, including Bernheim (1989), have excluded those answering “do not know” from the final sample under consideration. In more recent papers (e.g. Disney and Tanner 1999 and Cobb-Clark and Stillman 2006) the characteristics of those choosing the “do not know” or “do not plan to retire” response have been investigated more closely. Disney and Tanner (1999) and Cobb-Clark and Stillman (2006) argued that individuals who do not know at which age to retire might face greater uncertainty over their future labour market behaviour. Disney and Tanner (1999) found that individuals with a more variable employment history are more likely to state that they do not know at which age to retire. They also found that individuals showing a greater involvement with the labour market in full-time employment during their working lives are less likely to opt for the “do not know” response. Cobb-Clark and Stillman (2006) found that being an immigrant from English-speaking backgrounds or being single (i.e. not married or cohabiting) are associated with a higher probability of not knowing at which age to retire and being an immigrant from a non-English speaking country or being self-employed are associated with a higher probability of not planning to retire.

Based on these findings, we keep both those who do not plan to retire and do not know when to retire in our sample. We also assign them to two different outcome categories (“do not know” and “do not plan to retire”) due to the existence of important differences between the two groups. For example, self-employed are significantly more likely not to plan to retire and those who are unemployed or in education or training are more likely not to know at which age to retire. This will be investigated in more details in Section 6.

Turning to the distribution of retirement expectations, 34.3% of respondents aged 50 to 64 in our sample say that they expect to retire at age 65, compared to 20.7% planning to retire before turning 65 and 12.5% planning to retire at age 66 or older. Also, 20.1% of respondents say they do not plan to retire and 12.4% say they do not know at which age they will retire. Although the proportions of those who opted for the answers ‘do not plan to retire’ and ‘do not know’ might seem particularly high, they are in line with the figures of other international



studies. For example, 14.2% of respondents of the first wave of the Health Retirement Study reported that they did not know at what age to retire, and another 14.1% stated they never intended to retire. Also, around one third of women and less than one fifth of men aged 55 to 69 interviewed in the 1988 and 1989 waves of the Retirement Study in the UK reported they did not know at what age they would retire (Disney and Tanner 1999).

## 6. Explanatory variables

Focusing first on the explanatory variable(s) we are mostly interested in, our aim is to compare the effects on retirement expectations of two main – although different – events: the pension policy reform and the recession. The first question we address in this paper is whether and the extent to which the expected retirement ages of Irish people aged 50 to 64 have changed as a result of the pension policy announcement and/or the bad economic news.

The fieldwork for TILDA spanned from 18 October 2009 to 22 February 2011. As explained above, on 3 March 2010, the government announced that the age at which the state pension is paid would be raised to 66 in 2014, 67 in 2021 and 68 in 2028. This is the first event we are interested in. Also during 2010, the economic news became increasingly bad and on 30 September 2010 the full scale of the banking crisis emerged (named by the media as “Black Thursday”). This is the day in which the media announced that cost of the banking bailout had increased, that the bailout of Anglo Irish Bank alone would cost at least €29 billion and that - as a result - the 2011 budget would be tighter than expected.

Black Thursday was followed by the set of events which led to the bailout of November 2010. On 26 October 2010, the government announced that a budgetary adjustment of €15 billion would be required in the following four years to reduce the State’s deficit to 3% by 2014 (compared to €7.5bn as announced in the 2010 budget). On 4 November 2010, Finance Minister Brian Lehinan confirmed that the 2011 budget would include a €6 billion budget adjustment (compared to €3bn as released at the beginning of the same year). This was followed by visits to Ireland from EU and IMF officials. On 21 November 2010, it was announced that the Government would seek EU and IMF funding. An agreement was reached on 28 November 2010: the final bailout figure amounted to €85 billion, which Ireland will need to repay at a 5.8% interest rate. The 2011 budget was announced on 7 December 2010. Following the events of the last months of 2010, January 2011 was characterized by increasing political instability which resulted in the stepping down of Taoiseach Brian Cowen as leader of Fianna Fail on 22 January 2011.

In order to disentangle whether and the extent to which the pension policy announcement and/or the bad economic news have affected retirement expectations, we include two dummy variables in our model: 1) a dummy variable equal to 1 if the individual was interviewed after the policy reform (3 March 2010); 0 otherwise; 2) a dummy variable equal to 1 if the individual was interviewed after Black Thursday (30 September 2010); 0 otherwise.

Following the literature, we then include a number of explanatory variables which are believed to impact on retirement expectations. We control for the usual socio-economic and demographic characteristics and also include measures of physical and mental health, life expectancy, attitude towards risk and pension coverage. More specifically, the explanatory variables of our model include:

- Age (single year of age)
- Gender

- Marital status
- Educational attainment: highest qualification attained, in three categories: primary or none, secondary and third or higher<sup>3</sup>
- Current area of residence, in three categories: Dublin; town/city other than Dublin; rural area
- Current self-reported labour market status, in four categories: employed, self-employed; unemployed; and in education or training
- Public sector employee: a dummy variable equal to 1 if the individual is a public sector employee, 0 otherwise
- Pension coverage: a dummy variable equal to 1 if the individual is covered by an occupational pension scheme organized by her current or previous employer, a Personal Retirement Saving Account (PRSA) organized through her current employer, or another kind of personal pension scheme; 0 otherwise
- Number of self-reported chronic diseases from the following list: heart attack, heart failure, angina, cataracts, hypertension, high cholesterol, stroke, diabetes, lung disease, asthma, arthritis, osteoporosis, cancer, Parkinson's disease, peptic ulcer and hip fracture
- Quality of life: TILDA SCQ includes 19 questions on quality of life (CASP-19). Four domains are investigated: control – the ability to actively participate in one's environment; autonomy - the right of the individual to be free from the unwanted interference of others; self-realisation – the fulfilment of one's potential; and pleasure – the sense of happiness or enjoyment derived from engaging with life. Individuals are asked to indicate how often (often, sometimes, not often or never) each statement applies to them. Responses to each question are scored from 0 to 3. The total mean score ranges from 0 (complete absence of quality of life) to 57 (total satisfaction)
- Life expectancy: in TILDA, individuals aged 50 to 64 are asked to state the percent chance (on a scale from 0 to 100) that they will live to be 75 years of age. We create a dummy variable equal to 1 if the individual states that the chance (s)he will live to age 75 is 75% or more (high life expectancy); 0 otherwise
- Private health insurance: a dummy variable equal to 1 if the individual has private medical insurance cover (VHI etc) either in her name or through another family member, 0 otherwise.
- Number of children aged less than 18

Unfortunately, the sample size halves if we include (gross) assets, defined as the sum of principal private residence, savings, financial assets, cars, property and other. For this reason, our preferred specification does *not* include assets. However - as a robustness check - we also

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<sup>3</sup> In TILDA, education is measured by the highest level of formal education achieved. Irish-specific levels are reclassified into three categories: primary/none (not complete or primary or equivalent), secondary (intermediate/junior/group certificate or equivalent and leaving certificate or equivalent) and third/higher (diploma/certificate, primary degree and postgraduate/higher degree).

run a regression that includes assets as explanatory variable to verify that the results of the model that excludes assets are not biased. Results will be shown in section 7.1.

## 7. Descriptive statistics

Focusing first on the characteristics of those with different retirement expectations, Table 1 shows the shares of those planning to retire: before turning 65; at 65; after turning 65; not planning to retire; and uncertain about at which age to retire for *each* explanatory variable employed in our model. For dichotomous variables, statistically significant differences are reported for each subgroup with respect to the category which is omitted in the econometric model (i.e. interviewed before pension policy reform; interviewed before Black Thursday; female; tertiary or higher education; not married or cohabiting; living in Dublin; in paid employment; not covered by occupational or private pension scheme; not working in the public sector; low life expectancy and without a private health insurance). For continuous variables, statistically significant differences are reported with respect to the base outcome category (i.e. planning to retire at age 65). The conventional notation is used so that: \*\*\* if the difference is significant at 1% level, \*\* at the 5% level and \* at the 10% level. Standard deviations are not reported in the table, but can be made available on request.

Table 1 shows some interesting results. We focus first on the time variables which are of most interest in our paper. Table 1 shows that when we divide the sample by whether they were interviewed before or after March 30 2011, there are no statistically significant differences across the outcome categories. On the other hand, those who were interviewed after Black Thursday are less likely to plan to retire at 65 and more likely not to plan to retire or not to know at which age to retire if compared to those who were interviewed before Black Thursday. For instance, 28.9% of those interviewed after Black Thursday plan to retire at age 65, compared to 35.7% of those interviewed before Black Thursday. Similarly, 17.6% of those interviewed after Black Thursday do not know at which age to retire, compared to 11.1% of those interviewed before the Black Thursday.

Turning then to the other explanatory variables employed in our model, Table 1 shows that those who plan to leave the labour market before turning 65 are more likely to be younger, female, highly educated, living in Dublin, in paid employment or in education or training, covered by an occupational or private pension, working in the public sector and with a private health insurance. For example, 8.9% of those with primary or no education plan to retire before turning 65, compared to 31.2% of those with tertiary or higher education. Similarly, 28% of those who are covered by an occupational or private pension plan to retire before turning 65, compared to 9.3% of those who are not covered.

At the same time, those who do not plan to retire or do not know when to retire are more likely to be poorly educated, living in a rural area, self-employed or unemployed, not covered by an occupational or private pension scheme and scoring poorly in the CASP-19 score. For example, 37.6% of self-employed do not plan to retire, compared to 20.1% of those in paid employment. 24.1% of those living in a rural area do not plan to retire, compared to 15.3% of those living in Dublin and 17.3% of those living in a town or city other than Dublin. The mean CASP-19 score of those who do not know when to retire is 42.8, compared to 45.3 and 44.5 for those planning to retire before 65 or at 65, respectively.

*Table 1 around here*

## 8. Results

We first focus on the model that includes the two dummy variables “interviewed after the pension policy reform” and “interviewed after Black Thursday” (Model 1). The question we address in this model is whether and the extent to which the expected retirement ages of Irish people aged 50 to 64 have changed as a result of the pension policy announcement and/or the bad economic news.

### *8.1. Model 1: Pension policy reform versus (increasingly) bad economic news*

Focusing first on the controls which are of most interest for us, Table 2 shows there was no noticeable break in expected retirement ages before and after 3 March 2010, the day on which the pension policy announcement was made. The marginal effects of the dummy variable “interviewed after the pension policy reform” are not significant at conventional levels for any of the five outcome categories. However, there was a clear shift of people into the category “do not know” before and after Black Thursday. Similarly, there was a shift away from expecting to retire at age 65 after that date. The results of Table 2 show that the probability of expecting to retire at age 65 is 6.0% points lower for those who were interviewed after Black Thursday ( $p=0.023$ ). Similarly, the probability of not knowing at which age to retire is 5.6% points higher for those interviewed after Black Thursday ( $p=0.016$ ).

Turning to the other controls, Table 2 shows that - in line with the results of the descriptive statistics - the probability of expecting to retire before turning 65 is lower for those who are older, male, with primary or no education (marginal effect =  $-0.078$ ), self-employed and living in a rural area. Those covered by an occupational or private pension scheme and public sector workers are significantly more likely to expect to exit early from the labour market (marginal effects =  $0.118$  and  $0.093$ , respectively).

Table 2 also shows that the probability of not planning to retire or not knowing when to retire is higher for the self-employed and for those not covered by an occupational or private pension scheme. For example, the probability of not planning to retire is 16.1% points higher for the self-employed and 12.4% points lower for those who are covered by an occupational or private pension scheme.

*Table 2 around here*

As explained above, we did not control for wealth in Model 1 because the inclusion of this explanatory variable would cause the sample size to halve. As a robustness check, we run an additional regression in which also gross assets (given as the sum of principal private residence, savings, financial assets, cars, property and other) are included on the right-hand side of the equation. The results of this additional specification show that – as expected and in line with the results of Model 1 – those with higher assets are more likely to retire early (before turning 65) and less likely to say that they do not know when to retire. There are not statistically significant differences in the planned retirement ages of those who were interviewed before and after the announcement of the policy reform. The differences in the planned retirement ages of those who were interviewed before and after Black Thursday are now not statistically significant. However, the magnitude of the marginal effects is still not negligible. For example, the probability of saying that the planned retirement age is 65 is 4.8% points lower for those who were interviewed after Black Thursday.

### *8.2. Model 2: closer investigation of the impact of the pension policy announcement*

One could argue that the impacts of the pension reform announcement need to be investigated more rigorously given that the model in Table 2 included both those who will and will not be affected by the reform. Hence, in the models in Table 3 below we investigate the effects of the announcement of the reform on those who were i) affected and ii) not affected separately. Those i) affected are private sector employees who were born on or after 1 January 1949 (turning 65 in 2014 or onwards). Those ii) unaffected are public sector employees and private sector employees born before 1 January 1949 (turning 65 before 1 January 2014). We leave individuals who are unemployed, in education and training and self-employed out from Model 2 due to the ambiguity of their position.

Table 3 displays the marginal effects of the two dummy variables which are of most interest for us (i.e. interviewed after the announcement of the pension reform and interviewed after Black Thursday) for three separate specifications: Specification 1) includes both those affected and not affected by the reform; Specification 2) includes only those affected by the reform; and Specification 3) includes only those not affected by the reform.

The results of Table 3 - Specification 1 are in line with those of Table 2 – the variables employed in the two models are the same, but the number of observations is different, due to the exclusion of those in self-employment, unemployment and education and training here. The results of Table 3 - Specification 1 show that although there was no noticeable break in expected retirement ages before and after 3 March 2010 (the day on which the policy announcement was made), there was a clear shift of people from the category “planning to retire at 65” into the categories “don’t plan to retire” and “do not know” before and after September 30 2010.

Table 3 - Specification 2 focuses only on those who were affected by the reform, i.e. private sector employees born on or after 1 January 1949. Although most marginal effects are not statistically significant at conventional levels, the signs and magnitudes of marginal effects are worth commenting on. The announcement of the pension policy reform does not seem to have changed the retirement expectations of those who were affected by the reform. The only noticeable change is a reduction in the proportion of those who do not know when to retire after the announcement of the reform. On the other hand, there was a shift of people from the category “planning to retire at 65” into the categories “don’t plan to retire” and “do not know” before and after Black Thursday (the marginal effects are  $-0.008$ ,  $+0.038$  and  $+0.059$ , respectively with the first of these marginal effects having a p-value of under 11 percent and so on the margins of significance).

Table 3 - Specification 3 focuses on those who were not affected by the reform, i.e. public sector employees and private sector employees born before 1 January 1949. Once again, there was a shift from the category “planning to retire at 65” into the categories “don’t plan to retire” and “do not know” before and after Black Thursday (the marginal effects are  $-0.061$ ,  $+0.069$  and  $0.04$ , respectively). It is interesting to note that there was also a shift away from the category “planning to retire before turning 65” after the announcement of the policy reform. This could reflect a ‘spill over effect’ of the announcement of the pension reform to public sector employees, who already suffered a pay cut and the imposition of a pension levy in 2009.

*Table 3 around here*

### *8.3. Model 3: closer investigation of the impact of the recession: interaction effects*

In Model 3, we finally investigate whether the recession has impacted on some groups more than on others. For example, was the impact of the recession on retirement expectations stronger for males or females? Was it stronger for the poorly or highly educated? Was it stronger for those at the youngest or oldest end of the age distribution?

In order to understand whether the recession has impacted on the retirement expectations of some groups more than others, we use interaction effects. As Ai and Norton (2003), Mallick (2008) and Norton, Wang and Ai (2004) point out, the interpretation of interaction effects and marginal effects in nonlinear models is not straightforward. In linear models, the magnitude, sign and statistical significance of the interaction term are given by the coefficient and t statistics of the interaction term itself. In non-linear models, the magnitude of the interaction effects does not equal the coefficient on interaction term: it is conditional on the independent variables and the sign may be different at different values of the covariates. Also, the statistical significance of the interaction effect is not the t-statistic on the interaction term.

The command ‘margins’ in Stata 12 enables us to compute correct average marginal effects in our non-linear model including interaction terms. We use this command to compute the average marginal effect of the dummy variable “interviewed after Black Thursday” for different groups. We report results for: individuals aged 50-54, 55-59 and 60-64; males and females; individuals with primary or no education, intermediary education and tertiary or higher education; employees, self-employed, unemployed and in education or training; working and not working in the public sector; covered and not covered by an occupational or private pension scheme; and married and cohabiting and not married and cohabiting.

Table 4 below shows the marginal effects (and standard errors in square brackets) of the dummy variable “interviewed after Black Thursday” at different values of the interacted covariates which are of most interest for us. The results of Table 4 are very interesting. As expected, we observe a general shift from “planning to retire at age 65” to “do not plan to retire” or “do not know” after Black Thursday. Focusing first on age, those who have altered their expectations the most are in the youngest age group (aged 50 to 54). The first row of the table shows that the probability of expecting to retire at age 65 is 7.4% points lower for individuals aged 50 to 54 who were interviewed after Black Thursday (compared to individuals in the same age group who were interviewed before Black Thursday). Similarly, the probability of “not planning to retire” is 8.5% points higher for those aged 50 to 54 and interviewed after Black Thursday.

Turning to the other covariates, we observe a shift to the “do not know” category for those who do *not* work in the public sector; who are *not* covered by an occupational or private pension scheme and who have intermediary, primary or no education. At the same time, we observe a shift to the “do not plan to retire” category for those who work in the public sector and are covered by an occupational or private pension scheme. We explain this finding in terms of financial literacy: the shift to “do not plan to retire” seems to be more common for those who are more likely to be financially literate/well informed; the shift to “do not know” seems to be more common for those who are less likely to be financially literate/well informed. Although both groups have altered their expectations in response of the increasingly bad news on the Irish economy, they have done it in different ways. It is also interesting to note that the expectations of the highly educated group do not seem to have changed much during the recession.

*Table 4 around here*

## 9. Conclusions

Governments throughout the developed world are looking to raise state pension ages in an effort to tackle looming “pensions time-bombs”. Through such policies, governments hope to curb state spending on pensions and also to provide people with a stronger incentive to remain in work beyond current typical retirement ages. In March 2010, the Irish government announced a policy change along these lines, with the precise proposal being relatively ambitious. Given that a large-scale, representative sample of Irish people aged 50 and over was being conducted around the time of the policy announcement, this provided us with a unique opportunity to explore whether the policy had the impact of altering retirement expectations.

Our results suggest that people were susceptible to shifting their expected age of retirement in this period, as evidenced by the results on the impact of the recession. However, the announcement of the raising of the state pension age did not seem to result in a move away from early and standard retirement ages. Why might this have been so? One possible explanation is that people did not know about the reform. Alternatively, people may have known about it but did not believe that it would actually happen. Yet another possibility is that they knew about it, believed it but still felt that retiring no later than 65 was what they planned on doing.

Our data do not allow us to explore which of the three possible explanations might be true. It seems difficult to believe that the policy change was not known about, given the coverage in the media at the time. And as our data related to people aged 50 to 64, this is the group who are more likely to pay attention to retirement-related news stories. It also seems unlikely that there would be no change in expected retirement, if the policy was known about and believed. If this reasoning is correct, it leaves the explanation of the policy change not being believed as our preferred explanation. Such a conclusion would have many implications for policies of this nature, where pre-announcement of future changes is intended to induce changed behaviour now.

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Table 1: Descriptive statistics

	Outcome category:					Total
	1) 50-64	2) 65	3) 66+	4) Do not plan to retire	5) Do not know	
<i>Dichotomous Explanatory variables:</i>						
Interviewed after reform	0.202	0.334	0.126	0.209	0.130	1
Interviewed before reform (ref. cat.)	0.226	0.380	0.121	0.172	0.102	1
Interviewed after Black Thursday	0.191	0.289**	0.107	0.236*	0.176***	1
Interviewed before Black Thurs. (ref. cat.)	0.211	0.357	0.129	0.192	0.111	1
Male	0.171***	0.348	0.143***	0.221***	0.118	1
Female (ref. cat.)	0.258	0.336	0.099	0.173	0.133	1
None/primary educ.	0.089***	0.367	0.144	0.243***	0.156***	1
Secondary educ.	0.195***	0.340	0.127	0.208	0.131***	1
Third/higher educ.(ref. cat.)	0.312	0.333	0.108	0.159	0.088	1
Married or cohabiting	0.215*	0.346	0.123	0.195	0.121	1
Not married/cohabiting (ref. cat.)	0.180	0.333	0.130	0.221	0.136	1
Rural area	0.172***	0.313*	0.128	0.241***	0.147***	1
Town/city other than Dublin	0.211**	0.378	0.116	0.173	0.123**	1
Dublin (ref. cat.)	0.275	0.365	0.130	0.153	0.078	1
Self employed	0.105***	0.214***	0.142	0.376***	0.162***	1
Unemployed	0.094***	0.355	0.113	0.221***	0.216***	1
In education/training	0.227	0.271	0.054	0.196	0.252***	1
Employee (ref. cat.)	0.207	0.343	0.125	0.201	0.124	1
Has occup/private pension	0.280***	0.384***	0.110**	0.137***	0.089***	1
No occup/private pension (ref. cat.)	0.093	0.280	0.148	0.300	0.179	1
Public sector worker	0.355***	0.379**	0.102*	0.087***	0.078***	1
Not public sector worker (ref. cat.)	0.152	0.330	0.134	0.244	0.141	1
High life expectancy	0.201	0.345	0.127	0.207	0.120	1
Not high life expectancy (ref. cat.)	0.222	0.339	0.119	0.184	0.136	1
Private health insurance	0.260***	0.346	0.115*	0.177***	0.102***	1
No private health insurance (ref. cat.)	0.110	0.337	0.143	0.245	0.165	1
<i>Continuous explanatory variables:</i>						
Age	54.3***	56.2	57.0**	56.2	55.4**	--
Nr of chronic illnesses	1.1**	1.2	1.2	1.0***	1.2	--
CASP-19 score	45.3*	44.5	44.8	44.5	42.8***	--
N of children aged <18	0.343	0.276	0.251	0.358*	0.280	--
N	520	763	267	423	261	2,234

\*\*\*p<0.01 \*\*p<0.05 \*p<0.10. Data is weighted.

Table 2: Marginal effects [standard errors], Model 1

	Outcome category:				
	1) 50-64	2) 65	3) 66+	4) Do not plan to retire	5) Do not know
After pensions reform	-0.017 [0.023]	-0.032 [0.030]	0.006 [0.021]	0.024 [0.027]	0.018 [0.019]
After Black Thursday	-0.003 [0.020]	-0.060** [0.026]	-0.024 [0.018]	0.031 [0.026]	0.056** [0.023]
Age	-0.018*** [0.002]	0.009*** [0.003]	0.008*** [0.002]	0.005** [0.002]	-0.004** [0.002]
Male	-0.054*** [0.018]	0.036 [0.023]	0.054*** [0.015]	0.004 [0.020]	-0.039** [0.017]
None/Primary Education	-0.078*** [0.025]	0.054 [0.034]	-0.010 [0.023]	-0.004 [0.027]	0.038 [0.025]
Secondary Education	-0.034** [0.017]	0.010 [0.023]	0.004 [0.017]	0.001 [0.019]	0.019 [0.017]
Married or cohabiting	0.019 [0.019]	0.022 [0.025]	-0.006 [0.020]	-0.037 [0.024]	0.002 [0.018]
Lives in a rural area	-0.048** [0.020]	-0.016 [0.028]	-0.016 [0.020]	0.024 [0.027]	0.055** [0.022]
Lives in another city	-0.035* [0.021]	0.017 [0.029]	-0.021 [0.022]	-0.005 [0.029]	0.044 [0.028]
Self-employed	-0.063*** [0.022]	-0.167*** [0.027]	-0.015 [0.020]	0.161*** [0.027]	0.084*** [0.026]
Unemployed	-0.021 [0.033]	-0.007 [0.036]	-0.049** [0.021]	-0.008 [0.027]	0.085*** [0.030]
In education/training	0.067 [0.080]	-0.079 [0.082]	-0.078** [0.033]	-0.029 [0.065]	0.119 [0.073]
Occup./private pension	0.118*** [0.018]	0.094*** [0.024]	-0.045** [0.019]	-0.124*** [0.022]	-0.043** [0.019]
Public sector worker	0.093*** [0.021]	-0.003 [0.026]	-0.014 [0.020]	-0.074*** [0.024]	-0.001 [0.021]
High life expectancy	-0.034* [0.020]	0.010 [0.024]	0.009 [0.017]	0.021 [0.020]	-0.007 [0.018]
Private health insurance	0.094*** [0.019]	-0.006 [0.025]	-0.029 [0.020]	-0.043** [0.021]	-0.016 [0.017]
N of chronic illnesses	-0.001 [0.007]	0.017* [0.010]	-0.001 [0.008]	-0.018** [0.008]	0.003 [0.007]
CASP-19 score	0.001 [0.001]	0.000 [0.002]	0.001 [0.001]	0.000 [0.001]	-0.002** [0.001]
N of children aged <18	-0.024* [0.013]	-0.003 [0.015]	0.002 [0.012]	0.033*** [0.012]	-0.009 [0.011]
N	520	763	267	423	261

Notes: standard errors in square brackets. \*\*\*p<0.01 \*\*p<0.05 \*p<0.10. Data is weighted  
Reference categories are: third/higher level of education; lives in Dublin; employee.

Table 3: Marginal effects [standard errors] of time dummy variables, Model 2, Specifications 1, 2 and 3

		<i>Outcome category:</i>				
		1) 50-64	2) 65	3) 66+	4) Do not plan to retire	5) Do not know
<i>Specification:</i>	<i>Interviewed:</i>					
1. Affected & not affected by pension reform (N=1,474)	After pension reform	-0.021 [ 0.030]	-0.008 [0.036]	0.029 [0.023]	0.019 [ 0.026]	-0.020 [0.022]
	After Black Thursday	-0.011 [ 0.028]	-0.069** [0.034]	-0.022 [0.022]	0.055* [ 0.029]	0.046* [ 0.026]
2. Affected by pension reform (N=678)	After pension reform	0.027 [0.040]	-0.003 [0.053]	0.029 [0.034]	0.011 [0.044]	-0.064* [0.035]
	After Black Thursday	-0.008 [0.043]	-0.080 [0.050]	-0.010 [0.033]	0.038 [0.045]	0.059 [0.040]
3. Not affected by pension reform (N=796)	After pension reform	-0.060 [0.043]	-0.001 [0.045]	0.032 [0.031]	0.021 [0.025]	0.017 [0.026]
	After Black Thursday	-0.027 [0.039]	-0.061 [0.049]	-0.022 [0.035]	0.069* [0.038]	0.040 [0.030]

Table 4: Marginal effects [standard errors] of the dummy variable “interviewed after Black Thursday” at different values of the interacted covariates, Model 2

		Outcome category:				
		1) 50-64	2) 65	3) 66+	4) Do not plan to retire	5) Do not know
Age group:	50-54	-0.042 [0.032]	-0.074** [0.037]	-0.050** [0.024]	0.085** [0.039]	0.081** [0.034]
	55-59	0.043 [0.037]	-0.039 [0.041]	0.000 [0.027]	-0.036 [0.038]	0.031 [0.034]
	60-64	-0.016 [0.026]	-0.061 [0.059]	-0.015 [0.051]	0.040 [0.049]	0.052 [0.043]
Gender	Male	0.010 [0.027]	-0.069** [0.033]	-0.021 [0.025]	0.025 [0.031]	0.055* [0.029]
	Female	-0.022 [0.032]	-0.045 [0.039]	-0.031 [0.022]	0.040 [0.037]	0.058* [0.034]
Highest educational attainment	None/primary	-0.012 [0.039]	-0.118** [0.06]	-0.004 [0.049]	0.042 [0.060]	0.092* [0.055]
	Intermediary	-0.032 [0.030]	-0.050 [0.039]	-0.042 [0.026]	0.058 [0.036]	0.066* [0.034]
	Tertiary/higher	0.053 [0.037]	-0.028 [0.039]	-0.010 [0.026]	-0.027 [0.029]	0.012 [0.025]
Labour market status:	Employee	0.001 [0.025]	-0.057** [0.029]	-0.020 [0.018]	0.029 [0.021]	0.046** [0.019]
	Self-employed	-0.012 [0.013]	-0.051** [0.021]	-0.032 [0.021]	0.037 [0.040]	0.057* [0.030]
	Unemployed	-0.006 [0.012]	-0.084*** [0.030]	-0.033 [0.017]	0.027 [0.033]	0.096** [0.037]
	Education/training	-0.018 [0.026]	-0.073** [0.029]	-0.018 [0.015]	0.012 [0.032]	0.096** [0.044]
Working in the public sector	Yes	-0.027 [0.044]	-0.006 [0.051]	-0.047* [0.029]	0.072* [0.038]	0.009 [0.028]
	No	0.006 [0.024]	-0.078** [0.031]	-0.017 [0.022]	0.016 [0.033]	0.073** [0.030]
Covered by occupational/private pension scheme	Yes	0.007 [0.029]	-0.052 [0.034]	-0.021 [0.021]	0.045* [0.026]	0.022 [0.023]
	No	-0.020 [0.027]	-0.071* [0.039]	-0.029 [0.033]	0.007 [0.046]	0.112*** [0.043]
Married or cohabiting	Yes	-0.012 [0.023]	-0.050* [0.029]	-0.010 [0.020]	0.029 [0.027]	0.042* [0.025]
	No	0.028 [0.038]	-0.093* [0.051]	-0.074** [0.035]	0.036 [0.057]	0.103** [0.050]