

Nolan, Anne; Barrett, Alan

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DISCUSSION PAPER SERIES

IZA DP No. 11664

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Anne Nolan
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Anne Nolan

Economic and Social Research Institute and Trinity College Dublin

Alan Barrett

Economic and Social Research Institute, Trinity College Dublin and IZA

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ABSTRACT

Working Beyond 65 in Ireland

Extending working lives is often proposed as one route through which the costs associated with population ageing can be managed. In that context, understanding who currently works for longer can help policymakers to design policies to facilitate longer working. In particular, it is important to know if longer working is a choice or a necessity, where necessity arises from a lack of pension income. In this paper, we use data from the first four waves of the Irish Longitudinal Study of Ageing (TILDA), covering the period 2010-2016, to examine patterns of labour force participation among men and women aged 65+. We find that a lack of pension income is an important determinant of later-life working and that this applies for both men and women. Although older women are significantly less likely to work than older men, we find few differences in the pattern of determinants of longer working among older men and women. However, while women are significantly less likely to work than men, this effect is stronger among married women compared to single women. This suggests that older women without immediate access to family-provided financial support may need to work to support themselves. This adds to the picture of later life work being a necessity as opposed to a choice. However, an alternative explanation is that older married women may also have caring responsibilities that reduce their labour force participation.

JEL Classification: D14, H55, J14, J26

Keywords: retirement, pensions, older workers, Ireland

Corresponding author:

Anne Nolan
Economic and Social Research Institute
Whitaker Square
Sir John Rogerson's Quay
Dublin 2
Ireland
E-mail: anne.nolan@esri.ie

1. Introduction

It is well established that populations in the western world are ageing and that this phenomenon will put upward pressure on the costs of public programmes such as pensions, healthcare and long-term care. One proposed route through which the sustainability of these public programmes can be enhanced is through extended working lives. If people can be persuaded to remain in the workforce for longer, the workforce and hence GDP will increase, as will the tax revenues which underpin public programmes. In addition, if pensions are drawn later, there could be a saving to the state. The probability of policies succeeding in this area will be greater if we understand more fully what keeps people working longer. It could be that some people chose to work longer if they enjoy work and the non-pay benefits such as social engagement, purpose and structure. But it could also be the case that people work longer out of financial necessity, in particular if they do not have access to pension income.

In this paper, we use data from the Irish Longitudinal Study on Ageing (TILDA), a nationally-representative study of the population aged 50+ in Ireland to develop our understanding of later-life working in Ireland. We first examine the prevalence of working past the age of 65 and the characteristics of those who do so, differentiating between men and women. We then move on to estimate multivariate models of the predictors of work at older age among men and women, with a key concern being the role played by financial factors, primarily pension income receipt, in employment decisions at older ages. Inadequate financial provision for retirement may 'force' some individuals to delay retirement, and men and women may differ with regard to the relative strengths of these incentives. We find that women are significantly less likely to work than men, and that a lack of pension income is an important determinant of later-life working for both genders. Although older women are significantly less likely to work than older men, we find few differences in the pattern of determinants of longer working among older men and women. However, while women are significantly less likely to work than men, this effect is stronger among married women compared to single women. This suggests that older women without immediate access to family-provided financial support may need to work to support themselves. This adds to the picture of later life work being a necessity as opposed to a choice. However, an alternative explanation is that older married women may also have caring responsibilities that reduce their labour force participation.

The paper is structured as follows: Section 2 provides an overview of previous literature on work at older ages, with a particular focus on differences between men and women. Section 3 provides some brief details on key institutional details, with a focus on the pension system in Ireland. Section 4 describes the data and methods used in this paper. Section 5 outlines our empirical results while Section 6 discusses the results and draws out some implications for policy.

2. Previous Literature

In Europe and the US, the share of the older population in employment has been increasing in recent decades, although labour force participation in older age among men has not yet returned to the levels observed in the 1950s and 1960s (Chandler and Tetlow, 2014a, Maestas and Zissimopoulos, 2010). Rates of labour force participation among women at older age remain considerably lower than those of men. However, in Ireland, as in other countries, employment rates among older women have been increasing steadily over the last few decades. Figure 1 illustrates that in Ireland, among men aged 65+, employment rates increased from 15.3 per cent in 1998 to 16.7 per cent in 2016 (and are now back at the levels observed prior to the recession). The employment rate among women aged 65+ increased from just 2.8 per cent in 1996 to 5.0 per cent in 2016. Employment rates among 65+ year old men and women in Ireland are higher than the EU-28 average, particularly so for men.¹ Increased labour force participation of women in older age is part of the general increase in cohort labour force participation rates. Successive cohorts, for various reasons, including increased educational attainment and legislative changes in relation to employment rights, have increased their participation at all ages, resulting in an upward shift of participation by birth cohort (Goldin and Katz, 2017, Chandler and Tetlow, 2014b).

[insert Figure 1 here]

The decision to participate in the labour market at older age involves a complex interaction between health, family and caring responsibilities, and financial resources (Weir, 2017, French and Jones, 2017). For example, while poor health may be associated with earlier labour force withdrawal, poor health throughout the working life may also affect the accumulation of financial assets, necessitating

¹ In 2016, the EU-28 average employment rate for 65+ year old men was 8.2 per cent (ranging from 2.4 per cent in Spain to 23.8 per cent in Estonia), while for women the EU-28 average was 3.2 per cent (ranging from 1.2 per cent in Belgium to 26.2 per cent in Estonia). See <https://stats.oecd.org/> for details [last accessed 7 December 2017].

later life working (Weir, 2017). In terms of the broad characteristics of those who work in later life, research from the US Health and Retirement Study (HRS) suggests that those who work in older age are more likely to be male, healthy, better educated, wealthier, and younger; to live in an area with low rates of unemployment; and to have higher pre-retirement incomes, shorter tenure in last job, and higher level pre-retirement occupational positions than their counterparts who are not working in later life (Weir, 2017, Pleau, 2010). Using data from the Survey of Health, Ageing and Retirement in Europe (SHARE), Wahrendorf et al. (2016) describe employment and working conditions of employed men and women aged 65 or older across 16 European countries. They find that people who are working between the ages of 65 and 80 years are more likely to be male, are slightly younger, have higher levels of education, and are wealthier than those who are retired. Those that are working are also more likely to be self-employed, to be in better health, to have lower levels of work stress, and to work fewer hours than the retired.²

As noted, the decision to participate in the labour market at older age involves a complex interaction between health, family and caring responsibilities, and financial resources. Health and disability are key drivers of labour supply decisions in later life. The positive relationship between poor health and earlier labour force exit has been well documented (Weir, 2017, Ozawa and Lum, 2005, Emmerson and Tetlow, 2006). However, research from the US and UK documents substantial additional health capacity to work at older ages (Banks et al., 2015, Coile et al., 2016).³ Family circumstances have an important influence on labour force decisions. For married individuals, spousal labour supply is an important driver of individual labour supply; for example, using data from the early 1990s in the US, Ozawa and Lum (2005) find that men aged 70+ with working spouses were more than three times more likely to be working than men aged 70+ without a working spouse. They also find that for these men aged 70+, spousal health had no influence on the decision to work.⁴ Goldin and Katz (2017), using data from the US HRS, document that married women are far more likely to be in the labour force in their older years if their husbands are also working. Gustman and Steinmeier (2004) find that the degree to which each spouse values being able to spend time in retirement with the other

² For the retired group, the characteristics of the last job are used for comparison.

³ For example, the UK exercise shows that men aged 64 in 2013 had an employment rate of 44 per cent, compared to an employment rate of 90 per cent for men aged 54 in 1977 (on the basis of mortality rates, men aged 64 in 2013 and 54 in 1977 can be considered comparable in terms of health). They note that this suggests (crudely) that men aged 64 in 2013 had additional work capacity of 46 percentage points (Banks et al., 2015).

⁴ Due to the small number of cases, they did not examine working patterns for women aged 70+.

accounts for a good portion of the apparent interdependence in retirement decisions among couples.⁵

Decisions about working longer are strongly influenced by public and private pension and disability programmes (Weir, 2017). For example, research from the *Social Security Programs and Retirement around the World* project documents that financial incentives are an important determinant of both within- and cross-country differences in labour force participation rates in older age (Wise, 2012, Coile et al., 2017).⁶ Cahill et al. (2006) find that both low- and high-income individuals work in retirement, suggesting a u-shaped pattern of post-retirement employment based on pre-retirement income (i.e., some may want to work, while others may need to work). Hurd and Rohwedder (2011), using data from the US HRS, note that defined benefit pensions play an important role in determining labour force participation rates, and that changes in the prevalence of defined benefit and defined contribution pensions are associated with changes in retirement rates over the period 1992-2004. Focusing on women in the UK, Cribb et al. (2014) examine the impact of the increase the earliest age at which women could claim a state pension on the employment of women and their partners.⁷ They find that women's employment rates at age 60 increased by 7.3 percentage points when the state pension age was increased to 61. The employment rates of the male partners also increased by 4.2 percentage points.

A more recent body of research has examined the extent to which both subjective and objective characteristics of work determine working decisions in later life. For example, Angrisani et al. (2015) find that both subjective and objective measures of job characteristics influence decisions about work at older ages. Objective measures (derived from the O*NET database on occupational characteristics⁸) are strongly associated with transitions from full-time work to retirement and with retirement intentions. Sonnega et al. (2018) use data from waves 3-12 of the HRS to run Cox proportional hazard models of retirement timing (for those who were working full-time at baseline)

⁵ For the wife, the husband's retirement status influences her retirement decision only if she values spending time in retirement with her husband. For husbands, the effect of having the wife already retired on his retirement decision is roughly doubled if he enjoys spending time in retirement with his wife, but there is some effect even if he does not.

⁶ This project compared the experiences of a dozen developed countries (Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Spain, Sweden, UK, US) and used differences in their retirement programme provisions to explore the effect of social security on retirement and related questions.

⁷ In 1995, the UK government legislated to increase the earliest age at which women could claim a state pension from 60 to 65 between April 2010 and March 2020. Cribb et al. (2014) uses data from the first two years of this change coming into effect to estimate the impact of increasing the state pension age from 60 to 61 on the employment of women and their partners.

⁸ O*NET stands for Occupational Information Network (<https://www.onetonline.org/>).

and find that of the three HRS job characteristic variables, only the stressfulness of the job (between ages 56 and 59) is associated with retiring earlier. Looking at the O*NET ratings, jobs that are physically demanding are associated with earlier retirement. Examining the mismatch between subjective and objective job demands and personal resources (e.g., physical limitations, depression), they find significant associations between some, but not all, measures of mismatch and retirement timing (e.g., those with low mobility working in physically-demanding jobs are significantly associated with earlier retirement). In general, there is no association between mismatch of objective work demands and resources, and retirement timing.

Focusing on differences between men and women in retirement decisions, it is well known that caring responsibilities are important determinants of labour force participation decisions among women. The OECD find that family caring duties account for 4 per cent of women's exits from the labour force on average, although shares are 7 per cent or more in Germany, Ireland, and the UK (OECD, 2016). Research from the US suggests that for women, the arrival of a new grandchild is associated with a significant increase in the probability of retirement (Lumsdaine and Vermeer, 2015). Olivetti and Rotz (2017) note that marital history is also important in shaping women's labour force participation in older age, as past marriages and divorces shape previous economic decisions (e.g., labour supply) and the processes of human and financial capital accumulation. Using data from the US HRS, Fahle and McGarry (2017) find that the caring for a parent or parent-in-law is associated with a significantly lower probability of employment for women, and a significant reduction in hours, for those who remain employed.

A number of papers have examined the 'compensation hypothesis' in women's later-life working decisions, i.e., the tendency to work for longer to compensate for periods out of the labour force in earlier life due to caring commitments. For example, König (2017), using data from Denmark and Sweden from the SHARE, finds evidence that women compensate for lower labour market attachment due to long part-time periods by working longer, especially among younger cohorts. The role of the pension system is important; in Denmark where there are high replacement rates for low-income groups and fewer penalties for early retirement, she finds that the compensation effect is less prevalent. Finch (2014), using data from 14 waves of the British Household Panel Survey (BHPS), also finds evidence for the 'compensation hypothesis', but in addition, finds evidence that women with the highest work orientation prior to the state pension age (SPA) are most likely to continue

working after the SPA. Using data from the US HRS, Maestas (2017) finds that working until age 70, i.e., beyond the Social Security early and full retirement ages, would lead to a sizable increase in the magnitude of lifetime Social Security benefits to which married women are entitled. She finds that the gain in years worked at older ages would be sufficient to offset early gaps in their earnings records and would place women on par with men in terms of lifetime benefits.

Traditionally, workers transitioned from full-time work to full and permanent retirement. Increasingly, however, retirement is a process, often occurring in a series of steps over several years (Weir, 2017, van Solinge, 2014). For many individuals, 'retirement' is already a gradual process, perhaps entailing reductions in hours of work, a switch from employment to self-employment, and sometimes re-entry to the labour market after a period out of work (Chandler and Tetlow, 2014b). A growing literature considers the characteristics of those who reverse retirement decisions (Cahill et al., 2011). For example, Kanabar (2015) uses data from the English Longitudinal Study on Ageing (ELSA) over the period 2002 to 2013 to show that 'unretirement' is relatively common in England, although only among men. In an analysis of data from the US HRS, Maestas (2010) also finds that 'unretirement' is much more common among men. Pleau (2010) examines gender differences in post-retirement re-entry into employment using the first eight waves of the US HRS, covering the period 1992 to 2015. Overall, the rate of re-entry into the labour force was higher for men. For women, being married and having higher household wealth were negatively associated, and higher earnings positively associated, with labour force re-entry; for men, wealth and earnings had the opposite effect. Divorced and separated women had a greater likelihood of labour force re-entry than married women and this difference increased with time out of the labour force, suggesting push factors that derive from economic vulnerability. Contrary to expectations, non-resident familial caregiving had no significant effect on labour force re-entry, even when controlling for income and wealth. Kail and Warner (2013), also using the US HRS, find that among men and women who return to work following retirement, men are much more likely to return to full-time work than women. Again using the HRS, and examining 'bridge employment' (i.e., working between a full-time career job and full retirement), von Bonsdorff et al. (2017) find that women with families and possible subsequent care responsibilities are more prone to withdrawing from working life, while men are more likely to enter 'bridge employment'.

3. Institutional Context

Before proceeding to discuss the data and methods used in our analysis, it is useful to outline some key features of Ireland's pension system, and provisions for extended working. The Irish pension system is a three-pillar system, comprising state, occupational and private pension elements. The first pillar comprises the state (contributory or non-contributory) pension, which is a flat-rate payment, payable from age 66. Entitlement to the state pension (contributory) is based on a complex set of rules, and is dependent on when the individual first entered employment, the number of social insurance contributions, and the average number of contributions per year. The state (non-contributory) pension is subject to a means test. Claiming benefits before the state pension age (SPA) of 66 is not permitted. There is no provision to defer claiming the state pension. Both pensions are subject to income tax, but in practice those relying on the state pension as their only source of income would not pay any tax.

The second pillar comprises voluntary occupational pensions, which cover a broad section of the population (approximately half of all employees are covered). Tax relief at the marginal rate is available for contributions to approved occupational pension schemes. It is generally not possible to contribute to an occupational pension scheme after the normal age of retirement. Along with New Zealand, Ireland is the only OECD country without a mandatory, second-tier pension provision (OECD, 2016). Finally, the third pillar is a voluntary savings pillar, typically comprised of long-term personal savings and financial investments used to fund retirement over and above first and second pillar arrangements.

Currently, the SPA in Ireland is 66. Prior to 2014, the state pension (contributory) in Ireland was payable at age 65 to individuals who retired from insurable employment and satisfied certain social insurance contribution conditions. The qualifying age was increased to 66 years in 2014, with individuals born on or after the 1st of January 1949 qualifying at age 66 while those born before January 1949 still qualifying for the pension at age 65 (Redmond et al., 2017).⁹ For both the contributory and non-contributory state pensions, the SPA will further increase to 67 in 2021 and to 68 in 2028 (Government of Ireland, 2010). In 2014 in Ireland, the effective retirement age for men was 65.4, and 62.6 for women (OECD, 2016).

⁹ The SPA for the non-contributory pension was always 66.

There are a small number of public sector occupations that have statutory upper age limits but, in general, there is no rule which prevents individuals over the age of 65 from being employed or self-employed.¹⁰ The State pension (contributory) does not require the individual to retire and is not subject to an earnings test.¹¹ However, most public sector pension schemes are subject to what is called *abatement* if the individual returns to work in the public sector, meaning that the pension is reduced in order to ensure that the individual does not earn more from the pension and the income from employment than they would if they had remained in employment. If an individual is getting a public service pension and goes to work in the private sector, their public sector pension is not affected.

4. Data and Methods

In this paper, we use data from the first four waves of the Irish Longitudinal Study on Ageing (TILDA), covering the period 2010-2016. TILDA is a nationally representative sample of community-dwelling individuals aged 50 years and over, and their spouses or partners of any age (i.e., individuals living in nursing homes or other institutions were excluded at baseline). The study is harmonised with other international longitudinal studies of ageing, such as the US Health and Retirement Study (HRS), the Survey of Health, Ageing and Retirement in Europe (SHARE) and the English Longitudinal Study on Ageing (ELSA). Data collection for the first wave took place over the period October 2009 to February 2011, when 8,504 individuals were sampled, of which 8,175 were aged 50+ years (Barrett et al., 2011). The second wave of TILDA was carried out between April 2012 and March 2013, when 87.5 per cent of participants in wave 1 were successfully re-interviewed (Nolan et al., 2014). Wave 3 was conducted between March 2014 and October 2015, with an 85 per cent response rate, and wave 4 between January 2016 and December 2016 (McGarrigle et al., 2017).¹² Data collection for wave 5 is still ongoing, and so data from the first four waves are employed in this paper. Further information on the sample design is available in Whelan and Savva (2013).

¹⁰ There is no statutory retirement age for employees in the private sector, but the Employment Equality Acts and Unfair Dismissals Acts do not prohibit the imposition of a compulsory retirement age in a company. In practice, the majority of private sector companies set out a retirement age in either contract form or on the basis of the pension date established in the relevant occupational pension documentation. Only a very small number of private sector companies have, to date, adjusted their retirement date to align with the new SPA of 66 (Department of Public Expenditure and Reform, 2016).

¹¹ Prior to 2014, those reaching the age of 65 were paid the state pension (transition), which required the individual to retire. The abolition of the state pension (transition) in 2014 removed a significant disincentive to working past the SPA.

¹² At time of writing, the response rate for wave 4 had yet to be released by the TILDA team.

The dataset contains a rich set of variables on the demographic, health and socio-economic circumstances of older people in Ireland. Data are collected primarily via computer-aided personal interviewing (CAPI).¹³ Altogether, we have 27,126 observations from an unbalanced panel¹⁴ of 8,372 individuals aged 50+ available for analysis. As we are focusing on work at older ages, we focus on those aged 65+ in this paper. This leaves a sample size of 13,859, representing 5,158 individuals aged 65+ observed at least once over the period 2010 to 2016. The majority (52 per cent) of these 5,158 individuals are observed for at least three waves.

This paper investigates patterns of work at older age in the older population in Ireland. As a first step, we examine the prevalence of work over the age of 65, focusing on differences between men and women, using data from wave 1 (2010). This is essentially a descriptive analysis, which allows us to examine the association between working past the age of 65 and various individual and household demographic, socio-economic and health status characteristics. We then move on to estimate a binary probit model of working past the age of 65, pooling the data from waves 1 to 4, covering the period 2010-2016, as follows:

$$\Pr(W_{it}) = f(X_{it}, \mu_{it}) \tag{1}$$

where W_{it} is a dummy variable indicating whether individual i was working (i.e., employed or self-employed) at time t , and X_{it} represents other demographic, socio-economic, health and financial variables, also measured at time t . This specification will allow us to examine the independent effects on working past the age of 65, e.g., is there a significant effect for health, once we control for age? It will also allow us to ascertain the extent to which women are less likely than men to work in older age, controlling for other correlates of later-life working such as age, health status, education level or pension income receipt/levels. To account for the existence of multiple observations per respondent in this analysis, as a respondent may feature up to four times in this analysis, we also adjust the standard errors for clustering at the individual level.

¹³ The majority of all participants also complete a self-completion questionnaire (SCQ) which is designed to collect more sensitive information on issues such as relationships, expectations and mood/feelings. At waves 1 and 3, approximately 80 per cent of participants also underwent a nurse-led health assessment, which collected a wide range of data on anthropometrics, cardiovascular health, eye health, physical functioning, and cognition (Cronin et al., 2013, McGarrigle et al., 2017). Data from the CAPI only are used in this paper.

¹⁴ An unbalanced panel comprises observations that are present in at least one sample wave, with the majority of observations observed in at least three waves.

In defining employment status, we combine responses to two questions in the CAPI. The first asks individuals to 'best describe' their 'current situation', with seven possible mutually exclusive responses: retired; employed¹⁵; self-employed¹⁶; unemployed; permanently sick or disabled; looking after home or family; in education or training; and 'other'. For those that are not employed or self-employed, they are asked if they nonetheless did any paid work, for at least one hour, in the previous week. We reclassify any individuals who report that they worked for pay for at least one hour in the previous week as 'employed'.¹⁷ Our dummy dependent variable therefore takes the value 1 if an individual is employed or self-employed, and 0 if the individual is retired, unemployed, permanently sick or disabled, looking after home or family, or in education or training (and has not worked for pay for at least one hour in the previous week).

5. Results

a. Descriptive Analysis

Figures 2a (men) and 2b (women) illustrate the proportion of the over 50s population in each employment status in wave 1 (2010), disaggregated by five-year age bands. Clear differences are apparent between men and women, although the proportions of men and women employed are similar at all ages. Substantially higher proportions of women than men report 'looking after home or family' as their main status. Transition probabilities (which examine the probability of transitioning from one employment state to another over time) also show that a non-trivial proportion of women who were employed or self-employed in one wave transition to 'looking after home or family' in a subsequent wave, a transition that is non-existent for men.¹⁸ This phenomenon (whereby a proportion of older women who were employed switch to 'looking after home or family' rather than retirement) has also been observed in earlier research on labour market participation in the older population in Ireland (Russell and Fahey, 2004). While we do not consider these broader transitions in this paper, further research is needed to understand the mechanisms behind these varied 'retirement' transitions among men and women in greater detail.

¹⁵ This category includes unpaid work in family business, temporarily away from work, or participating in apprenticeship or an employment programme, such as Community Employment.

¹⁶ This category includes farmers.

¹⁷ This is a common classification of employment, and is also used by Eurostat in classifying individuals' labour market status from the EU Labour Force Survey: <http://ec.europa.eu/eurostat/web/lfs/methodology/main-concepts> [last accessed 18 August 2017]. Overall, across the four waves of TILDA, from a total sample size of 26,860 with valid information on employment status, this reclassification results in 713 individuals being classified as employed, rather than retired, unemployed, permanently sick or disabled, looking after home or family, or in education or training.

¹⁸ See Appendix Tables A1 and A2.

[insert Figures 2a and 2b here]

Next, we focus on those over the age of 65, and compare the characteristics of women and men who are working past age 65. In total across the period 2010-2016, 1,852 individuals aged 65+ were working (i.e., either employed or self-employed), representing 13.6 per cent of the total 65+ population over that period. For the descriptive analysis, we focus on the characteristics of men and women who were working and aged 65+ in wave 1 (2010). In total at wave 1, 285 men and 150 women who were aged 65+ were either employed or self-employed (representing 16.4 per cent of all men, and 7.1 per cent of all women aged 65+ in 2010).

The data in Table 1 reveal that older working women are on average slightly younger than older working men (but that this difference is driven largely by the fact that older self-employed women are significantly younger than older self-employed men). They are also significantly less likely to be married than men (but this time, the difference is driven by the significantly lower proportion of employed women who are married, in contrast to the proportion of employed men who are married). There are no significant differences in educational attainment, or in health status, between men and women. Reflecting the differences in labour force participation rates presented in Figures 2a and 2b, a significantly higher proportion of women who are married have a working spouse than their married male counterparts.

[insert Table 1 here]

The literature review in Section 2 highlighted the importance of financial resources in determining labour supply decisions at older age. In terms of pension income, Table 2 shows that there is no significant difference in the proportion of older working men and women who are receiving occupational pension income (approximately 25 per cent). However, older working women are significantly less likely than men to have both private pension and state pension income, and in both cases this is driven by the lower proportions among employed women in comparison with employed men. Due to the low proportions having private pension income, in the analyses in Section 5.2 we generate an indicator for any supplementary pension income that indicates if the individual has occupational and/or private pension income.

[insert Table 2 here]

In Table 3, we examine differences in levels of weekly individual income from various sources for older working men and women. Older working women earn less from labour and assets than their male counterparts, but the difference is not statistically significant.¹⁹ They do not differ in terms of supplementary pension income levels, or in terms of state pension income levels, but older working women earn significantly more than older working men in the form of other state benefits (although the levels are very small for both men and women).

[insert Table 3 here]

Finally, in Table 4, we examine the working history of older working men and women. Men started their first job at the age of 16.7 years, significantly younger than women who started their first job at age 18.4 on average (but this difference is driven largely by the difference in first job age between self-employed men and women). Older working women have had substantially shorter careers than their male counterparts; 35 years on average for women, in contrast to 53 years on average men. Older working men and women do not differ in the proportion who do not plan to retire (approximately 65 per cent for both), nor in terms of the expected age of retirement for those who do plan to retire. For older working employees (i.e., excluding the self-employed²⁰), women work significantly fewer hours per week than men. In terms of sector of work, the top three sectors for men aged 65+ are farming (43 per cent), 'other service activities' (12 per cent) and 'transportation and storage' (8 per cent), while for women aged 65+, the top three sectors are 'human health and social work activities' (22 per cent), farming (14 per cent) and 'other service activities' (11 per cent).²¹

[insert Table 4 here]

¹⁹ An example of asset income is income from rents.

²⁰ In TILDA, hours of work are not recorded for the non-farming self-employed.

²¹ For those not engaged in farming, the nature of their business or activity is classified according to the NACE Rev. 2 industry classification. Data on NACE sector are not shown in Table 4.

b. Multivariate Analysis

In this section, we model the determinants of working for men and women aged 65+, controlling for a variety of other demographic, socio-economic and health status characteristics. Our first analysis, reported in Table 5, considers the full sample of those aged 65, and models the probability of working (i.e., either employed or self-employed). Column (1) shows that women are on average 11 percentage points less likely to work than men aged 65+, controlling just for age and time period. As expected, the probability of working declines with age. In comparison with wave 1 (2010), those observed in wave 4 (2016) are significantly more likely to be working. While there were a number of policy changes in the period after 2010 that could have increased the probability of working in later waves (e.g., the abolition of the state pension (transition) in 2014, and the incentivised early retirement schemes in the public service, which were first introduced in 2009/2010), when we include only those who were aged 65+ from wave 1, the effect of wave 4 is no longer significant.²² This indicates that the positive effect for wave 4 is driven by the addition of younger individuals into the analysis sample (i.e., individuals who age past 65 appear in the sample when they first turn 65), who have a higher overall probability of working.

In column (2), we add controls for education and marital status. Compared with those who are married, single individuals are significantly more likely to work, while widowed individuals are significantly less likely to work (even controlling for age). In comparison with those with a third level education, those with a primary education or less are significantly less likely to work. Column (3) adds controls for health status, with all results as expected (i.e., poorer mental health, having a chronic illness, or having a disability that limits the kind or amount of work are all associated with a significantly lower probability of working). Finally, in column (4), we add controls for having an income from a supplementary (occupational and/or private) and state pension. We find that not having income from a supplementary pension or a state pension is associated with a significantly higher probability of working.²³

²² Using data from the CSO Quarterly National Household Survey (QNHS), Redmond et al. (2017) find no effect of the abolition of the state pension (transition) on the probability of retirement among 65-year olds in Ireland.

²³ Previous research by the authors found that the self-employed, who have significantly lower levels of supplementary pension cover, are significantly more likely to work in older age (Nolan and Barrett, 2018, forthcoming). However, when we run the models in Table 5 excluding the self-employed, the effect for supplementary pension income remains significant. Thus, the higher probability of working past age 65 for those without supplementary pension income is not driven solely by the group of self-employed.

[insert Table 5 here]

Within TILDA, there are numerous ways to define individual and family financial resources so in Table 6, we run a couple of additional analyses. In column (6), we re-define the various pension income source variables to consider not only individual income receipt, but also receipt by a spouse or partner, where appropriate. The previous results are confirmed, i.e., that the absence of supplementary pension income in the household, or state pension income, is associated with a significantly higher probability of working. In column (7), we consider the *level* of supplementary pension, state pension and other state benefit income, rather than simply the presence/absence of supplementary and state pension income. In all cases, the higher the individual (and spouse) income from supplementary private, state pension and other state benefits, the lower is the probability of working. In all cases, even after controlling for the financial situation of the individual/household, women are still significantly less likely to work than men.²⁴

[insert Table 6 here]

In Table 7, we stratify the analysis by sex, in order to examine in greater detail any differences in the determinants of working among men and women aged 65+. Overall, there are few, if any, differences in the determinants of working among older men and women.²⁵ In terms of marital status, there is some evidence that separated/divorced women are significantly more likely to be working than their married counterparts. For men in contrast, widowhood is associated with a significantly lower probability of working (in comparison with being married).²⁶ Finally, the positive effect of not having supplementary pension income on the probability of working is much higher for

²⁴ The marginal effect for women does not differ significantly across the three models in Table 6.

²⁵ In comparison with wave 1 (2010), men are significantly more likely to be working in later waves, while there is no significant difference in the probability of women working over the period 2010-2016. However, as with the earlier analysis in Table 5, this effect for men disappears when we include only those who were aged 65+ from wave 1 in the sample.

²⁶ It is possible this reflects a selection effect associated with widowhood for men, and/or a differential impact on labour supply of caring for a spouse in the period before death between men and women.

men than for women, suggesting that financial incentives play a relatively more important role in determining work at older age among men than women in Ireland.²⁷

[insert Table 7 here]

The literature review in Section 2 highlighted the importance of family circumstances for labour supply decisions for women. In Table 8, we therefore present the results of an analysis where we stratify the sample by household type, distinguishing between single households (i.e., household size of one); non-married households, with more than one household member; married households (with two household members); and other married households (with more than two household members). We can see that across all household types, women are significantly less likely to work than men. However, this effect is stronger among the married than the single households, and in particular, between single households and other married households. Raymo et al. (2004) find a similar result in their analysis of work at older ages in Japan, and suggest that older women without immediate access to family-provided financial support may need to work to support themselves. They may also face fewer caring responsibilities than married women.

[insert Table 8 here]

In Table 9, we focus on married, two-person households in more detail, and examine the extent to which spousal employment status and health determines individual working in older age. We find that while those without a working spouse are themselves significantly less likely to work in older age²⁸, having a spouse with a chronic illness is insignificant in determining the probability of working in older age.

[insert Table 9 here]

²⁷ Boeri and Brugiavini (2008), exploiting a natural experiment in Italy that changed incentives for early retirement found stronger effects of the policy change for men than for women, although the effect for women was dependent on the number and length of 'gaps in career'.

²⁸ Stratifying the analysis by sex shows that there is no significant difference in the negative effect of having a non-working spouse on the probability of working between men and women.

6. Discussion and Policy Implications

Understanding who works for longer can help policymakers to prepare for the future ageing of the population. Using data from the first four waves of the Irish Longitudinal Study of Ageing (TILDA), covering the period 2010-2016, we find that lacking pension income is an important determinant of later-life working for men and women. While an analysis using cross-sectional data cannot rule out the possibility that there are unobserved factors that jointly determine lower levels of pension cover and income, and later-life working (e.g., tastes, preferences, degree of risk aversion, *etc.*), the evidence in this paper suggests that later-life working may result from economic necessity. While women are significantly less likely to work than men, this effect is stronger among the married than the single households. This is consistent with an explanation which sees older women without immediate access to family-provided financial support needing to work to support themselves and so adds to the evidence on necessity leading to later work. We should note that it might also be the case that older married women may also have caring responsibilities that reduce their labour force participation.

The implications for policy of the results are not straightforward and in some ways the results can be viewed as highlighting a policy dilemma. Pension policy in Ireland has stated objectives such as increasing cover and replacement rates (Government of Ireland, 2010). These objectives reflect a desire to ensure high standards of living among Ireland's older people in the future. However, the evidence here suggests that the achievement of these goals will work against the goal of extending working lives. While the government does not have a formal policy on this, it can be argued that raising the SPA to 68 by 2028 is certainly consistent with a policy on longer working, although through choice and not compulsion.

So how can the objectives be reconciled? The objectives of increasing pension cover and replacement rates should be maintained but it will have to be recognised that efforts to extend working lives will need to be even more intense if they are to succeed in the context of improving pension cover and replacement rates. More attention will need to be paid to the non-financial factors that facilitate longer working lives such as flexibility in hours, the capacity to move down the career ladder, and adjustments to accommodate changing physical demands. However, clearly financial incentives matter, so it is important to design pensions system in ways that provide positive

incentives while guaranteeing incomes in retirement. This leads to the suggestion that there be greater degree of actuarial fairness in systems through which payments are adjusted in line with the length of contributions, even after a 'pension age' (often 65) is arrived at.

As a final remark we should note that, consistent with the international literature, health and disability are found to be important determinants of working past the age of 65 in Ireland. While research from the UK and US documents considerable additional health capacity to work at older ages (Banks et al., 2015, Coile et al., 2016), it is clear that those in poor health may require different policy responses to facilitate longer working lives. A variety of policy responses may therefore be required to balance the goals of fostering employment opportunities for older workers, while at the same time facilitating reasonable paths to exit the labor force for those who are unable or unwilling to work.

7. Acknowledgements

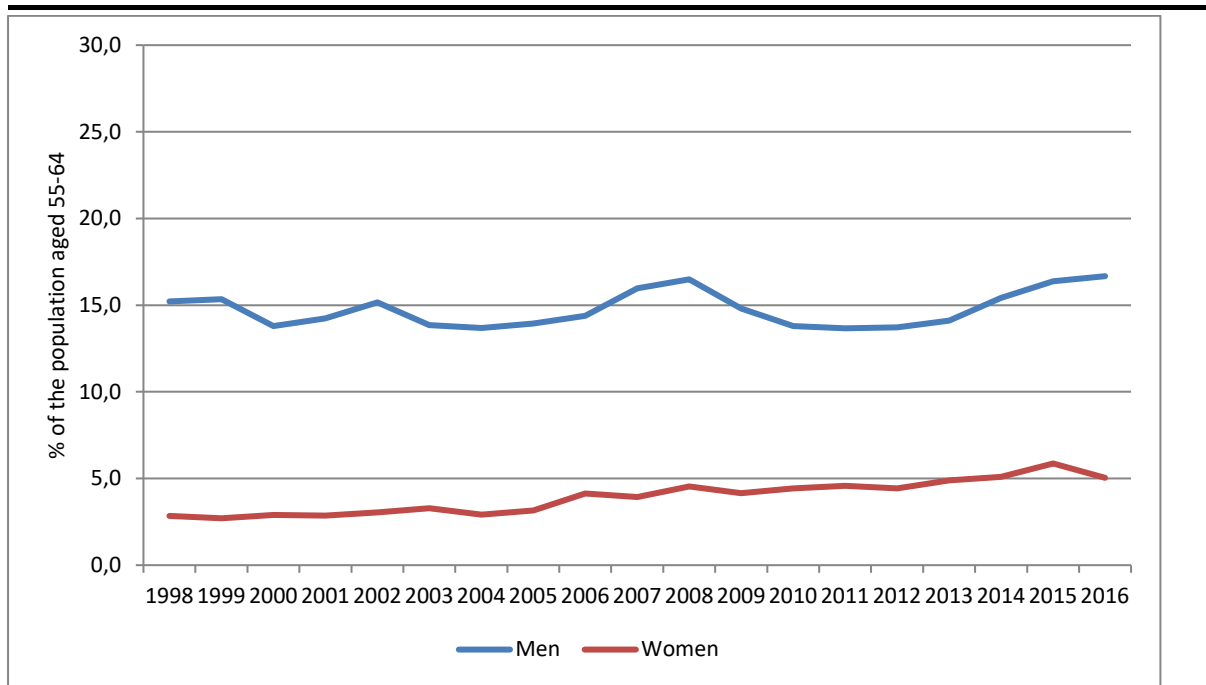
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FIGURE 1 Employment Rates, 65+ year olds, Ireland, 1998-2016



Source: OECD (<https://stats.oecd.org/>)

FIGURE 2a Current Employment Status, by Age (% of the population), Men, 2010



Note: Population weights are employed. The category 'employed' includes those in other categories who undertook paid work for at least one hour in the previous week. 'Other' includes the unemployed, permanently sick or disabled and in education or training groups.

Source: TILDA, wave 1 (2010)

FIGURE 2b Current Employment Status, by Age (% of the population), Women, 2010



Note: Population weights are employed. The category 'employed' includes those in other categories who undertook paid work for at least one hour in the previous week. 'Other' includes the unemployed, permanently sick or disabled and in education or training groups.

Source: TILDA, wave 1 (2010)

TABLE 1 Demographic, Socio-Economic and Health Characteristics of Working Men and Women aged 65+, 2010

	Men	Women
Age	71.1 [70.5 – 71.8]	69.3 [68.4 – 70.1]
% Married	69.7 [64.3 – 75.0]	56.1 [48.0 – 64.1]
% Third Level Education	19.1 [14.5 – 23.7]	26.0 [18.9 – 33.1]
% Excellent Mental Health	26.7 [21.5 – 31.9]	32.6 [25.0 – 42.0]
% No Chronic Illness	68.3 [62.9 – 73.8]	64.7 [56.9 – 72.4]
% No Work Disability	86.5 [82.5 – 90.5]	93.0 [88.8 – 97.1]
% Working Spouse ^a	28.2 [21.1 – 35.4]	46.6 [33.1 – 60.1]

Note: Population weights are employed. 95% confidence intervals are presented in parentheses. At wave 1, there were n=285 men either employed (n=113) or self-employed (n=172), and n=150 women either employed (n=113) or self-employed (n=37).

a The sample for % working spouse is restricted to those who are married or cohabiting.

Source: TILDA, wave 1 (2010)

TABLE 2 Sources of Pension Income for Working Men and Women aged 65+, 2010

	Men	Women
% receiving occupational pension income	25.7 [20.6 – 30.8]	24.7 [17.6 – 31.7]
% receiving private pension income	10.8 [7.2 – 14.5]	3.2 [0.3 – 6.0]
% receiving supplementary pension income ^a	33.1 [27.6 – 38.6]	25.3 [18.1 – 32.4]
% receiving state pension income	73.2 [68.1 – 78.4]	57.4 [49.3 – 65.4]

Note: Population weights are employed. 95% confidence intervals are presented in parentheses.

a Supplementary pension income includes both occupational and private pension income.

Source: TILDA, wave 1 (2010)

TABLE 3 Weekly Individual Income (€) of Working Men and Women aged 65+, 2010

	Men	Women
Labour and asset income	274.4 [200.1 – 348.8]	177.6 [128.8 – 226.3]
Supplementary pension income	133.9 [28.8 – 238.9]	70.4 [26.1 – 114.7]
State pension income	121.6 [111.3 – 131.8]	111.9 [97.5 – 126.4]
Other state benefit income	1.5 [0.3 – 2.8]	7.7 [3.4 – 11.9]
Total income ^a	690.9 [576.0 – 805.7]	492.2 [382.2 – 602.2]

Note: Population weights are employed. 95% confidence intervals are presented in parentheses.

a There are more missing observations for total individual income, as observations with a missing value for any of the four components of individual income are recorded as missing for the total.

Source: TILDA, wave 1 (2010)

TABLE 4 Employment History of Working Men and Women aged 65+, 2010

	Men	Women
Age first employed/self-employed	16.7 [16.3 – 17.0]	18.4 [17.5 – 19.2]
Years spent employed/self-employed	53.0 [52.1 – 53.9]	35.2 [32.6 – 37.8]
% working life employed/self-employed	97.5 [96.4 – 98.4]	69.2 [64.2 – 74.1]
Expected retirement age, for those planning to retire	71.6 [70.0 – 73.2]	69.5 [68.2 – 70.7]
% do not plan to retire	64.9 [57.7 – 72.1]	63.6 [52.9 – 74.4]
Average weekly hours ^a	34.5 [30.2 – 38.7]	19.7 [16.8 – 22.6]

Note: Population weights are employed. 95% confidence intervals are presented in parentheses.

a The sample for average weekly hours is restricted to those who are employed only.

Source: TILDA, wave 1 (2010)

TABLE 5 Probit Model of Working after Age 65 (Marginal Effects)

	(1)	(2)	(3)	(4)
Male	ref	ref	ref	ref
Female	-0.108 (0.008)***	-0.104 (0.008)***	-0.102 (0.008)***	-0.132 (0.009)***
Age 65-69	ref	ref	ref	ref
Age 70-74	-0.105 (0.008)**	-0.100 (0.008)***	-0.096 (0.008)***	-0.083 (0.008)***
Age 75+	-0.157 (0.009)***	-0.148 (0.009)***	-0.141 (0.009)***	-0.129 (0.009)***
Wave 1	ref	ref	ref	ref
Wave 2	0.004 (0.006)	0.003 (0.006)	0.007 (0.006)	0.010 (0.006)*
Wave 3	0.004 (0.006)	0.002 (0.006)	0.006 (0.006)	0.010 (0.006)
Wave 4	0.038 (0.007)***	0.034 (0.007)***	0.035 (0.007)***	0.033 (0.007)***
Married		ref	ref	ref
Single		0.033 (0.015)**	0.038 (0.016)**	0.035 (0.015)**
Separated/divorced		0.013 (0.020)	0.027 (0.021)	0.023 (0.020)
Widowed		-0.024 (0.010)**	-0.021 (0.010)**	-0.019 (0.010)*
Primary Education		-0.033 (0.010)***	-0.021 (0.010)**	-0.064 (0.011)***
Secondary Education		-0.017 (0.011)	-0.012 (0.010)	-0.041 (0.011)***
Third Level Education		ref	ref	ref
Excellent mental health			ref	ref
Very good mental health			0.007 (0.009)	0.003 (0.008)
Good mental health			-0.005 (0.009)	-0.012 (0.009)
Fair/poor mental health			-0.045 (0.012)***	-0.052 (0.012)***
No chronic illness			ref	ref
Chronic illness(es)			-0.021 (0.007)***	-0.016 (0.007)**
No work disability			ref	ref
Work disability			-0.063 (0.008)***	-0.067 (0.007)***
Supplementary pension income				ref
No supplementary pension income				0.112 (0.008)***
State pension income				ref
No state pension income				0.030 (0.008)***
N	13,854	13,840	13,731	13,601

Note: Models the probability of being working (i.e., employed or self-employed), conditional on being aged 65+.
* p<0.1, ** p<0.05; *** p<0.01

TABLE 6 Alternative Definitions of Individual and Family Resources

	(5)	(6)	(7)
Male	ref	ref	ref
Female	-0.132 (0.009)***	-0.112 (0.008)***	-0.111 (0.009)***
Supplementary pension income	ref	ref	
No supplementary pension income	0.112 (0.008)***	0.100 (0.008)***	
State pension income	ref	ref	
No state pension income	0.030 (0.008)***	0.032 (0.009)***	
Supplementary pension income (log)			-0.010 (0.001)***
Social welfare pension income (log)			-0.004 (0.001)***
Social welfare other benefit income (log)			-0.003 (0.001)***
N	13,601	13,644	13,234

Note: Models the probability of being working (i.e., employed or self-employed), conditional on being aged 65+. All other controls as per model (4) in Table 5 included.

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

Model 5: as per model (4) in Table 5

Model 6: re-defining pension income sources to incorporate spousal income, where appropriate

Model 7: replacing pension income receipt variables with variables indicating household equalised income

TABLE 7 Stratification by Sex

	Men	Women
Age 65-69	ref	ref
Age 70-74	-0.085 (0.012)***	-0.068 (0.009)***
Age 75+	-0.138 (0.015)***	-0.111 (0.010)***
Wave 1	ref	ref
Wave 2	0.016 (0.010)	0.005 (0.007)
Wave 3	0.031 (0.011)***	-0.008 (0.007)
Wave 4	0.049 (0.011)***	0.016 (0.008)*
Married	ref	ref
Single	0.012 (0.022)	0.023 (0.018)
Separated/divorced	-0.019 (0.035)	0.042 (0.022)*
Widowed	-0.072 (0.022)***	0.010 (0.011)
Primary Education	-0.057 (0.019)***	-0.069 (0.012)***
Secondary Education	-0.037 (0.018)**	-0.036 (0.012)***
Third Level Education	ref	ref
Excellent mental health	ref	ref
Very good mental health	0.019 (0.013)	-0.012 (0.010)
Good mental health	-0.006 (0.015)	-0.018 (0.011)
Fair/poor mental health	-0.087 (0.024)***	-0.035 (0.014)***
No chronic illness	ref	ref
Chronic illness(es)	-0.020 (0.012)*	-0.012 (0.008)
No work disability	ref	ref
Work disability	-0.102 (0.015)***	-0.045 (0.008)***
Supplementary pension income	ref	ref
No supplementary pension income	0.179 (0.013)***	0.050 (0.009)***
State pension income	ref	ref
No state pension income	0.036 (0.014)***	0.023 (0.008)***
<i>N</i>	6,376	7,225

Note: Models the probability of being working (i.e., employed or self-employed), conditional on being aged 65+.
 * p<0.1, ** p<0.05; *** p<0.01

TABLE 8 Stratification by Household Type

	Single households (i.e., household size =1)	Non-married households, >1 household member	Married, 2 household members	Married, >2 household members
Male	ref	ref	ref	ref
Female	-0.099 (0.015)***	-0.128 (0.031)***	-0.149 (0.012)***	-0.200 (0.027)**
95% CIs	[-0.129, -0.070]	[-0.189, -0.068]	[-0.173, -0.126]	[-0.253, -0.147]
N	4,224	1,128	6,688	1,561

Note: Models the probability of being working (i.e., employed or self-employed), conditional on being aged 65+. All other controls as per model (4) in Table 5 included.
* p<0.1, ** p<0.05; *** p<0.01

TABLE 9 Effect of Spousal Characteristics in Married, 2-Person Households

	(1)	(2)	(3)
Male	ref	ref	ref
Female	-0.116 (0.011)***	-0.124 (0.012)***	-0.122 (0.013)***
Working - spouse		ref	
Not working - spouse		-0.100 (0.019)***	
No chronic illness - spouse			ref
Chronic illness - spouse			0.010 (0.012)
N	6,724	5,015	5,040

Note: Models the probability of being working (i.e., employed or self-employed) past age 65, conditional on being aged 65+. All other controls as per model (4) in Table 5 included. * p<0.1, ** p<0.05; *** p<0.01
Model 1: All covariates as per model (6) in Table 5
Model 2: including an indicator for working (i.e., employed or self-employed) spouse
Model 3: including an indicator for chronic illness status of spouse

9. Appendix

TABLE A1 Transition Probabilities, Men, 50+, Wave 1 (2010) – Wave 2 (2012)

	Retired	Employed	Self-Employed	Looking after home/family	Other	Total
Retired	1,196 (91.9)	45 (3.5)	33 (2.5)	2 (0.2)	25 (1.9)	1,301 (100.0)
Employed	153 (18.0)	576 (67.7)	58 (6.8)	3 (0.4)	61 (7.2)	851 (100.0)
Self-Employed	54 (9.0)	50 (8.4)	467 (78.1)	0 (0.0)	27 (4.5)	598 (100.0)
Looking after home/family	4 (21.1)	2 (10.5)	2 (10.5)	3 (15.8)	8 (42.1)	19 (100.0)
Other	61 (17.5)	38 (10.9)	20 (5.8)	8 (2.3)	221 (63.5)	348 (100.0)
Total	1,468 (47.1)	711 (22.8)	580 (18.6)	16 (0.5)	342 (11.0)	3,117 (100.0)

Note: Data refer to the number and proportion of the sample in a given state at wave 1 (2010) who transition to the same or another state in wave 2 (2012). For example, of those retired in wave 1 (2010), nearly 92 per cent were also retired in wave 2 (2012), while 3.5 per cent transitioned to employment, 2.5 per cent transitioned to self-employment, 0.2 per cent transitioned to 'looking after home/family' and 1.9 per cent to 'other', which includes 'unemployed', 'permanently sick or disabled', or 'in education or training'.

TABLE A2 Transition Probabilities, Women, 50+, Wave 1 (2010) – Wave 2 (2012)

	Retired	Employed	Self-Employed	Looking after home/family	Other	Total
Retired	797 (74.7)	27 (2.5)	8 (0.8)	200 (18.7)	35 (3.3)	1,067 (100.0)
Employed	159 (13.8)	860 (74.6)	35 (3.0)	60 (5.2)	39 (3.4)	1,153 (100.0)
Self-Employed	12 (7.4)	22 (13.5)	106 (65.0)	21 (12.9)	2 (1.2)	163 (100.0)
Looking after home/family	218 (22.3)	49 (5.0)	27 (2.8)	647 (66.2)	36 (3.7)	977 (100.0)
Other	54 (18.2)	29 (9.8)	5 (1.7)	78 (26.4)	130 (43.9)	296 (100.0)
Total	1,240 (33.9)	987 (27.0)	181 (5.0)	1,006 (27.5)	242 (6.6)	3,656 (100.0)

Note: Data refer to the proportion of the sample in a given state at wave 1 (2010) who transition to the same or another state in wave 2 (2012). For example, of those retired in wave 1 (2010), nearly 75 per cent were also retired in wave 2 (2012), while 2.5 per cent transitioned to employment, 0.8 per cent transitioned to self-employment, 18.7 per cent transitioned to 'looking after home/family' and 3.3 per cent to 'other', which includes 'unemployed', 'permanently sick or disabled', or 'in education or training'.