

Rowena Crawford

20/39

Working paper

How does pension saving change when individuals complete repayment of their mortgage?

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Rowena Crawford
Institute for Fiscal Studies

December 2020

Abstract

We examine the extent to which owner-occupiers in their 50s and 60s change their private pension saving when they complete repayment of the mortgage on their primary residence. Using panel data from a household survey, the English Longitudinal Study of Ageing, we identify those who completed repayment of their mortgage as anticipated two years prior. Despite mortgage expenditures falling by over £200 per person on average, there is little resulting change in average pension saving. This is because only a small minority of individuals react – the probability of an individual increasing their monthly pension saving by more than £150 increases by only 5 percentage points on completing repayment of a mortgage. This suggests that if policymakers wish to influence behaviour in order to increase private pension saving, interventions targeted at those completing their mortgage repayment could be a tractable approach. Such individuals would be able to increase pension saving while maintaining spending at recent levels.

JEL: D14, D15

Acknowledgements

We gratefully acknowledge funding from the IFS Retirement Saving Consortium, which comprises Age UK, Association of British Insurers, Aviva UK, Canada Life, Chartered Insurance Institute, Department for Work and Pensions, Investment Association, Legal and General Investment Management, and Money and Pensions Service, and co-funding from the ESRC-funded Centre for the Microeconomic Analysis of Public Policy (ES/M010147/1).

This work is based on analysis of the English Longitudinal Study of Ageing (ELSA), which was developed by a team of researchers based at the University College London, NatCen Social Research, and the Institute for Fiscal Studies. The data were collected by NatCen Social Research. The funding is currently provided by the National Institute of Aging (R01AG017644), and a consortium of UK government departments coordinated by the National Institute for Health Research.

Thank you to members of the IFS Retirement Saving Consortium, Carl Emmerson and Jonathan Cribb for helpful comments and suggestions during this research. All views, and any errors, are those of the author.

1. Introduction

Private pensions play an important role in securing the living standards of those in retirement. In the UK, where successive reforms legislated since the mid-1980s have reduced the generosity of the state pension over time, this is increasingly the case for later-born generations – and particularly so for middle and higher earners, for whom the level of income provided by the state pension increasingly compares less favourably to their working-life earnings.

Despite the importance of private pensions, saving in this form has, until recently, been in decline. The proportion of private-sector employees in a workplace pension declined from 47% in 1998 to 32% in 2012 (Cribb and Emmerson, 2019). In response to this trend, and the related concern that individuals were not saving enough for retirement, the UK government introduced ‘automatic enrolment’ – a policy reform that mandates that eligible employees have to be enrolled, by default, in to a workplace pension scheme, and that unless they opt out their employer must pay certain minimum contributions into the scheme. This has dramatically increased rates of pension membership (Cribb and Emmerson, 2020). However, concerns remain. Some groups are not covered by automatic enrolment, such as the self-employed – among whom the decline in pension saving has been even more dramatic than among private-sector employees, from 47% in 1998–99 to 19% in 2012–13 (Crawford and Karjalainen, 2020). Furthermore, many argue that the levels of pension saving being encouraged by automatic enrolment are not sufficient to provide individuals with an adequate income in retirement (Pensions and Lifetime Savings Association, 2018; Pensions Policy Institute, 2019).

One factor that matters in this debate is how pension saving changes over individuals’ life cycles. To the extent that individuals increase their pension saving as they age, as their earnings increase, or as their expenditure needs fall, extrapolating future retirement income on the basis of saving decisions when young could understate retirement resources. In this paper, we examine one specific question in this theme – the extent to which owner-occupiers change their pension saving when they complete repayment of the mortgage on their primary residence.

This question relates to the empirical economic literature on the life cycle permanent income hypothesis (LCPIH). One well-established prediction of this model is that consumption should not change in response to anticipated changes in income. There is a large empirical literature that has tested this prediction – as surveyed in Browning and Crossley (2001), Meghir and Pistaferri (2011) and Jappelli and Pistaferri (2010). One subset of this literature has treated mortgage completion as an anticipated increase in disposable income, and examined spending changes after the final mortgage payment (which the LCPIH predicts should not change). Coulibaly and Li (2006) find that US households do not alter non-durable consumption after mortgage repayment is complete. Financial savings and spending on some durable goods increase, but the increase in spending on these areas is

less than the decline in mortgage expenditures. Scholnick (2013) finds that the magnitude of the mortgage repayments is important.

An extension to this existing literature is to ask what happens to other aspects of saving at the point mortgage repayment is completed – in particular, saving in private pensions. If the timing of mortgage completion is exogenous, then an individual motivated to save in a private pension for retirement may choose to defer much of that saving until the period when mortgage expenditures have fallen to zero – because, at that point, pension saving can be increased by an equivalent amount without any change in consumption (as per the predictions of the LCPIH). Of course, individuals may wish to save in other forms – the prediction of the LCPIH is that consumption will not rise, rather than that saving in any particular form will increase – but saving in a pension is a tax-advantaged way to save for retirement. One might also make similar predictions, if one thought individuals focus attention or resources on saving for different motivations in a sequential fashion (for example, paying off their mortgage before focusing on saving for retirement).

We answer the question of whether older owner-occupiers change their pension saving when they complete repayment of the mortgage on their primary residence empirically, using biennial panel data from a household survey – the English Longitudinal Study of Ageing (ELSA)¹ – over the period 2004/05 to 2018/19. In addition to housing tenure, ELSA collects data on the remaining mortgage term for those with mortgages, enabling us to distinguish those who completed repayment of their mortgage when anticipated two years prior. We focus on these individuals, for whom the timing of mortgage completion is anticipated and plausibly exogenous. We then compare the change in pension saving over the two-year period during which mortgage repayment was completed, with the change in pension saving over two-year periods in which these individuals did not finish repaying their mortgage (either because they are continuing to repaying their mortgage, or because they had previously completed repayment).

We find that average mortgage expenditures per person are over £200 per month prior to mortgage repayment being completed. However, pension saving changes little, on average, when these mortgage expenditures cease. This is because while some individuals respond by increasing their pension saving, they are a small minority – the probability of an individual increasing their pension saving by more than £150 per month increases by only 5 percentage points around the time mortgage repayment is completed compared with when individuals continue to pay a mortgage.

This has two implications. First, these findings do nothing to assuage concerns about the inadequacy of individuals' private retirement saving. The behaviour of current older workers suggests it is not the

¹ Oldfield et al (2020).

case that many individuals are timing their pension saving in such a way that it will increase when mortgage expenditures fall. It is therefore appropriate to be concerned if current levels of saving are deemed too low, as these may not be expected to increase later in life given current behaviour. Second, however, this suggests an opportunity. If policymakers wish to influence behaviour and increase pension saving, policies that target individuals at the point they are finishing repaying their mortgages could have particular traction. These individuals could increase pension saving while maintaining spending at the levels they were used to while repaying their mortgages. This will increase overall financial preparedness for retirement if individuals would not have otherwise have saved these sums in other forms.

This paper is set out as follows. In Section 2, we describe our data in more detail, in particular how we determine our sample of interest. In Section 3, we present simple descriptive analysis of changes in pension saving, while in Section 4 we discuss our econometric approach and present our results. We conclude in Section 5 with a discussion of the implications of our findings for policy.

2. Data

We examine how pension saving changes when individuals complete repayment of their mortgage using data from the English Longitudinal Study of Ageing (ELSA), which is a household survey, representative of the private residential population of England aged 50 and over. The survey collects detailed information on individuals' income, wealth, labour market activities, their demographics and wider household composition, and includes subjective and objective measures of health.

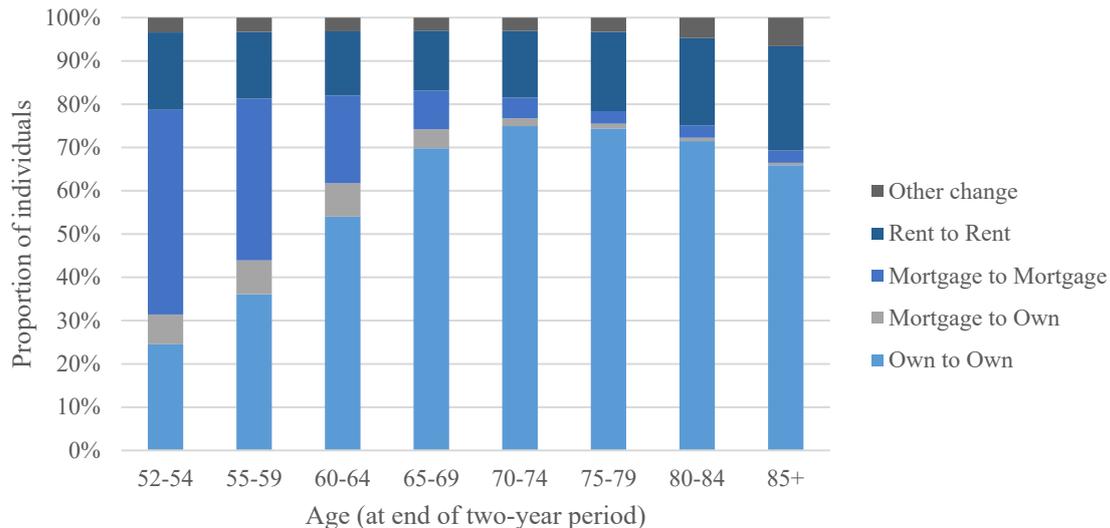
Crucially for our purposes, ELSA is a panel study, re-interviewing the same households every two years. This means that by comparing data on the same individuals between two consecutive surveys, we can identify whether an individual has finished repaying a mortgage on their main residence during that two-year period, as well as how their pension-saving behaviour and other circumstances have changed over the same time frame. ELSA has interviewed individuals every two years since 2002/03, so we can now make up to eight such comparisons, examining how individuals' situation has changed over two-year periods up to 2018/19.

Mortgage completion

ELSA respondents are asked their current housing tenure status – in other words, whether they own their current residence outright, whether they are buying it with the help of a mortgage, whether they rent it, or whether they live there under some other arrangement (such as living rent-free with family). We identify those who complete repayment of their mortgage as those who in one survey report that they are buying with the help of a mortgage, and two years later report that they own their property outright.

The proportion of individuals with various changes in tenure status over a two-year period is summarised in Figure 1. The vast majority of individuals do not change – either continuing to own outright, continuing to pay a mortgage, or continuing to rent. However, in 5% of two-year comparisons, an individual completed repayment of their mortgage. The distribution of this by age (where age is measured at the end of the two-year comparison) shows that repayment is concentrated among those aged under age 70 – few complete repayment of their mortgage at older ages.

Figure 1. Change in tenure over two-year period, by age



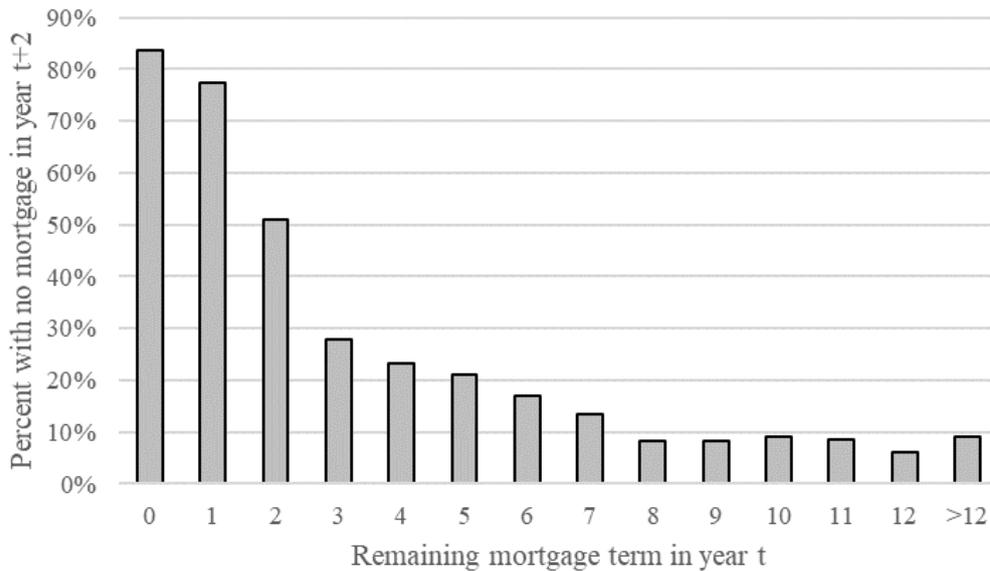
Note: Pooled sample of core ELSA respondents observed in two consecutive surveys 2002/03 to 2018/19. Age is defined as that when interviewed in the second survey.

ELSA also asks respondents a number of questions about their mortgage (or mortgages). The exact form of these questions has changed somewhat over time, but broadly information is elicited on the type of mortgage (capital repayment, interest only, endowment), outstanding balance, type of interest rate (fixed or variable rate), the amount of monthly repayments, and the number of years the mortgage has left to run.

The reported remaining mortgage term is important for understanding whether an observed mortgage completion was anticipated and plausibly exogenous. For those who completed their mortgage repayment when they were not previously anticipating doing so over that time period, some other aspects of their circumstances almost certainly also changed, and that other change may also affect pension saving. Figure 2 illustrates, for those with different remaining mortgage terms, the proportion who no longer had a mortgage when re-interviewed around two years later. Around 80% of those who reported a remaining mortgage term of less than two years had no mortgage when re-interviewed two years later – suggesting that the majority of individuals this close to the end of their mortgage term do

not re-finance. (The proportion of those with a mortgage term of two years who no longer had a mortgage is lower – at 50% – but given rounding in reporting, and the only approximate two-year gap between ELSA interviews, many of these individuals could still be completing repayment of their mortgage on the previously anticipated time frame. Indeed, nearly two-thirds of those who reported a remaining mortgage term at time $t - 2$ and still had a mortgage at time t report a remaining mortgage term in $t + 2$ of one year or less.)

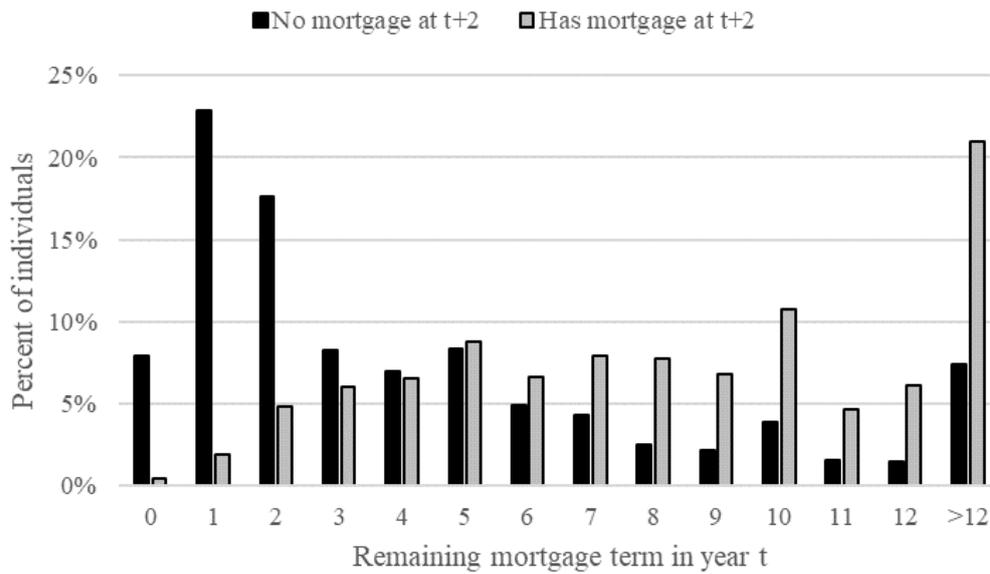
Figure 2. Mortgage prevalence by remaining term two years prior



Note: Excludes those who did not know their remaining mortgage term when asked (4% of individuals).

It is more common for individuals to pay off their mortgage earlier than anticipated. Figure 3 shows the distribution of remaining mortgage term in year t for those who no longer had a mortgage by time $t + 2$ (and, for comparison, the distribution of remaining mortgage term in year t for those who continued to have a mortgage at time $t + 2$). Among those who completed their mortgage repayment, 48% had previously reported a remaining mortgage term of two or fewer years, and 57% had reported a remaining mortgage term of three or fewer years. In other words, around half of those who completed their mortgage repayment did so around when their mortgage was expected to end, while around half stopped having a mortgage earlier than their remaining mortgage term suggested they would.

Figure 3. Distribution of remaining mortgage term



Note: Excludes those who did not know their remaining mortgage term (4% of those who completed repayment and 5% of those who continued repaying a mortgage).

Selected characteristics of those who completed their mortgage repayment are summarised in Table 1 – with the sample split by whether the completion was ‘anticipated’ (those who two years ago reported a remaining mortgage term of three or fewer years) or ‘unanticipated’ (those who reported a remaining term of more than three years). We can compare those for whom mortgage completion was unanticipated with those for whom it was anticipated. Those whose completion was unanticipated are on average younger, aged 50–59, with 56% compared with 40%. They are also more likely to have higher levels of education (24% compared with 19%), and to have either changed job over the same two-year period that the mortgage was completed (12% compared with 9%) or left work (16% compared with 14%). Those whose mortgage repayment was unanticipated are also more likely to have lost their remaining parent (or both of their parents) over the same two-year period (9% compared with 6%).

Table 1. Characteristics of those who complete mortgage repayment between t and $t + 2$

	All	Anticipated	Unanticipated
<i>At time t, percentage who were:</i>			
Aged 50–59	44.9	39.7	55.5
Aged 60–64	30.7	32.0	27.8
Aged 65–69	15.3	18.8	10.7
Aged 70+	9.2	9.5	6.0
Male	50.3	50.5	50.8
Female	49.7	49.5	49.2
Single	16.2	14.4	16.0
In couple	83.8	85.6	84.0
Low education	39.0	41.0	35.2
Mid education	38.4	38.1	39.4
High education	20.5	18.8	23.5
<i>Between time t and $t + 2$, percentage who:</i>			
Changed job	10.3	8.9	11.9
Stayed in same job	47.3	48.5	48.8
Never in work	26.4	27.3	21.4
Left work	14.5	14.1	15.9
Entered work	1.5	1.1	2.1
Last remaining or both parents died	7.7	6.1	9.1
<i>Period t to $t + 2$ was:</i>			
2002/03 to 2004/05	18.2	20.1	21.0
2004/05 to 2006/07	9.7	0.0	0.0
2006/07 to 2008/09	17.1	15.6	21.7
2008/09 to 2010/11	13.4	14.9	13.4
2010/11 to 2012/13	9.8	12.7	9.6
2012/13 to 2014/15	10.5	10.6	12.7
2014/15 to 2016/17	12.9	15.3	13.9
2016/17 to 2018/19	8.3	10.8	7.8
Observations	2,517	1,235	883

Note: ‘Anticipated’ completions are those who had a mortgage with a remaining term of three or fewer years at time t and no mortgage at $t + 2$, while ‘unanticipated’ completions are those with a mortgage with a remaining term of four or more years at time t and no mortgage at $t + 2$. For 16% of individuals, we cannot distinguish whether mortgage repayment was anticipated or not, largely because the relevant information was not asked in the 2004/05 ELSA survey. In addition, a small proportion of individuals (4%) did not know their remaining mortgage term when asked.

Private pension saving

ELSA collects detailed information on individuals' private pension arrangements. This includes whether they are currently contributing to any private pension, what type of pension it is, and what contributions they (and their employer, if applicable) are making.

We define private pension saving as individual contributions (in other words, not including any contributions made by an employer) to any type of pension. For occupational defined contribution pensions, this includes both the normal contributions for the scheme and any additional voluntary contributions paid by the individual. For occupational defined benefit pensions, this includes the normal contributions for the scheme and any additional free-standing voluntary contributions.² For personal pensions, this includes all regular contributions.

Individuals can choose to report pension contributions either as an amount in pounds (for a time period of the respondent's choice) or as a fraction of salary. We convert all pension contributions into monthly amounts in pounds, using current salary for those who reported contributions as a fraction of salary. Pension contributions are converted into real terms using the CPIH deflator (the Consumer Prices Index including owner-occupiers' housing costs), and are expressed in June 2017 prices.

There is a large amount of non-response to the questions on pension contributions – nearly 30% of individuals who are currently contributing to a pension. This is the result of individuals either not knowing how much they are contributing, or not knowing some other aspect of their employer's pension scheme rules such that ELSA does not ask them the questions required to establish total pension contributions.³ The non-response is non-random and, in particular, is concentrated among individuals who report that their pension is an employer pension rather than a personal pension. Probably, this is partly because those who have a personal pension and/or know that their pension is of this type are more engaged with their pension saving, and partly because the structure of the contribution questions asked of such pensions is simpler. As we will discuss below, we exclude from our analysis individuals who do not know the level of their pension contributions.

² We do not include additional voluntary contributions to defined benefit pensions that take the form of 'additional years' of benefits, as ELSA only elicits information on the number of years of benefits purchased and not on the cost of purchasing those benefits.

³ In particular, if individuals do not know whether their employer pension is a defined benefit type or a defined contribution type, then they are not asked their level of contributions. Furthermore, individuals with an employer pension are asked whether their employer requires them to contribute a minimum amount, and if so, they are asked what the minimum contribution is and whether/how much they contribute in excess of that. Many individuals report that they do not know the required minimum contribution, which, given the wording of subsequent questions, makes it difficult to determine the (total) level of contributions made in these instances.

Sample selection

The focus of this paper is on whether private pension saving increases when people complete repayment of their mortgages. Therefore, we restrict our attention to those observed completing mortgage repayment at some point during our data – and specifically those whose mortgage completion was ‘anticipated’. This is because we are interested in examining the effect of mortgage completion on pension saving. For those who completed their mortgage repayment when they were not previously anticipating doing so over that time period, some other aspect of their circumstances almost certainly also changed, and this other change may also affect pension saving. (This concern is supported by the summary statistics in Table 1, which show that the proportion of individuals changing jobs or leaving paid work, and the proportion of individuals losing either both parents or their last surviving parent, was greater among those who completed their mortgage repayment when they did not anticipate it than among those who did anticipate it.) In other words, among those who did not anticipate repayment completion, any association between pension saving and mortgage completion may be a spurious correlation, caused by the fact that both mortgage completion and pension saving are affected by this other change in circumstances, rather than the mortgage completion itself causing the change in pension saving.

Because we are interested in pension saving as an outcome, we further restrict our sample to those aged under the state pension age (SPA) and in paid work, both before and after the repayment of their mortgage (i.e. at time t and $t + 2$).⁴ This is because older individuals, and those not working, are extremely unlikely to be saving in a private pension. We also restrict our attention to individuals who knew the level of their pension contributions (or who were not contributing) both before and after the repayment of their mortgage. For individuals who did not know their contributions at one or other time, we cannot examine how their pension saving changed at that point. Finally, we restrict the sample to those who completed their mortgage repayment after the 2004/05 wave of ELSA, because the data on pension contributions collected in 2002/03 are not directly comparable with those collected in later waves.

The final sample consists of 242 individuals aged between 50 and their SPA, who were in work before and after the completion of their mortgage repayment, and who finished repaying their mortgage between 2004/05 and 2018/19. We observe these individuals collectively 874 times in two consecutive waves of data when they are owner-occupiers in both waves, working in both waves, and

⁴ The SPA is the earliest age at which individuals can claim an income from the state (public) pension. The SPA during the period covered by this analysis was 65 for men, and for women it was 60 until 2010 before increasing gradually to reach 65 by the end of 2018.

knew their pension contributions in both waves. This is a relatively small, and quite selected, sample, but because of these sample restrictions we are able to focus in on a group of particular interest.

Our analysis is conducted at the individual level, but intra-household optimisation may be important. If one individual can save in a pension on more favourable terms (for example, would benefit from greater tax relief, or a higher employer match rate), or has greater flexibility to change their pension contributions, or if there are fixed effort costs involved with changing pension contributions, then it is possible that only one individual in any household may increase their pension saving in response to mortgage completion. In our sample, the 242 individuals are drawn from 214 households. 27 individuals are single, while 52 have a partner who is aged above the SPA or who was not in work either before or after the mortgage was repaid. For these individuals, if anyone in the household responds to the change in mortgage expenditures by changing their pension saving, then it has to be, or is likely to be, the individual in the sample. For the other 163 individuals, 56 have a partner also in the sample while 107 have a partner who either did not respond to ELSA, was aged under 50, did not know their pension contributions, or did not make the sample selection criteria for some other reason. For these individuals, it might be expected that only half of the individuals in the sample respond to the ending of mortgage repayments by increasing their pension contributions. Taken together, if every household responds to mortgage completion by increasing pension contributions, but only half of working individuals aged under the SPA do so, then in our sample we might expect around two-thirds of individuals to change their pension contributions on mortgage completion.

3. Descriptive analysis

Mortgage repayments

The distribution of monthly mortgage repayments in the survey immediately before mortgage completion for our sample is summarised in Table 2. The median is £356 at the household level, and the mean is £434 (expressed in June 2017 prices).⁵ Taking into account whether the individual is part of a couple (as both individuals in a couple could not increase pension saving to the extent of household mortgage expenditures without reducing other saving or consumption), the median mortgage payment per person is £180 per month and the mean is £231 per month.

Table 2. Distribution of monthly mortgage payments in the wave prior to completion

	Household level	Per person
Mean	£434	£231
10 th percentile	£78	£43

⁵ For context, the mean total household income is £3,311 per month (and the median is £3,094).

25 th percentile	£172	£87
Median	£356	£180
75 th percentile	£528	£273
90 th percentile	£854	£507

Note: Mortgage payments are expressed in June 2017 prices, adjusted for inflation as measured by the CPIH.

Pension saving

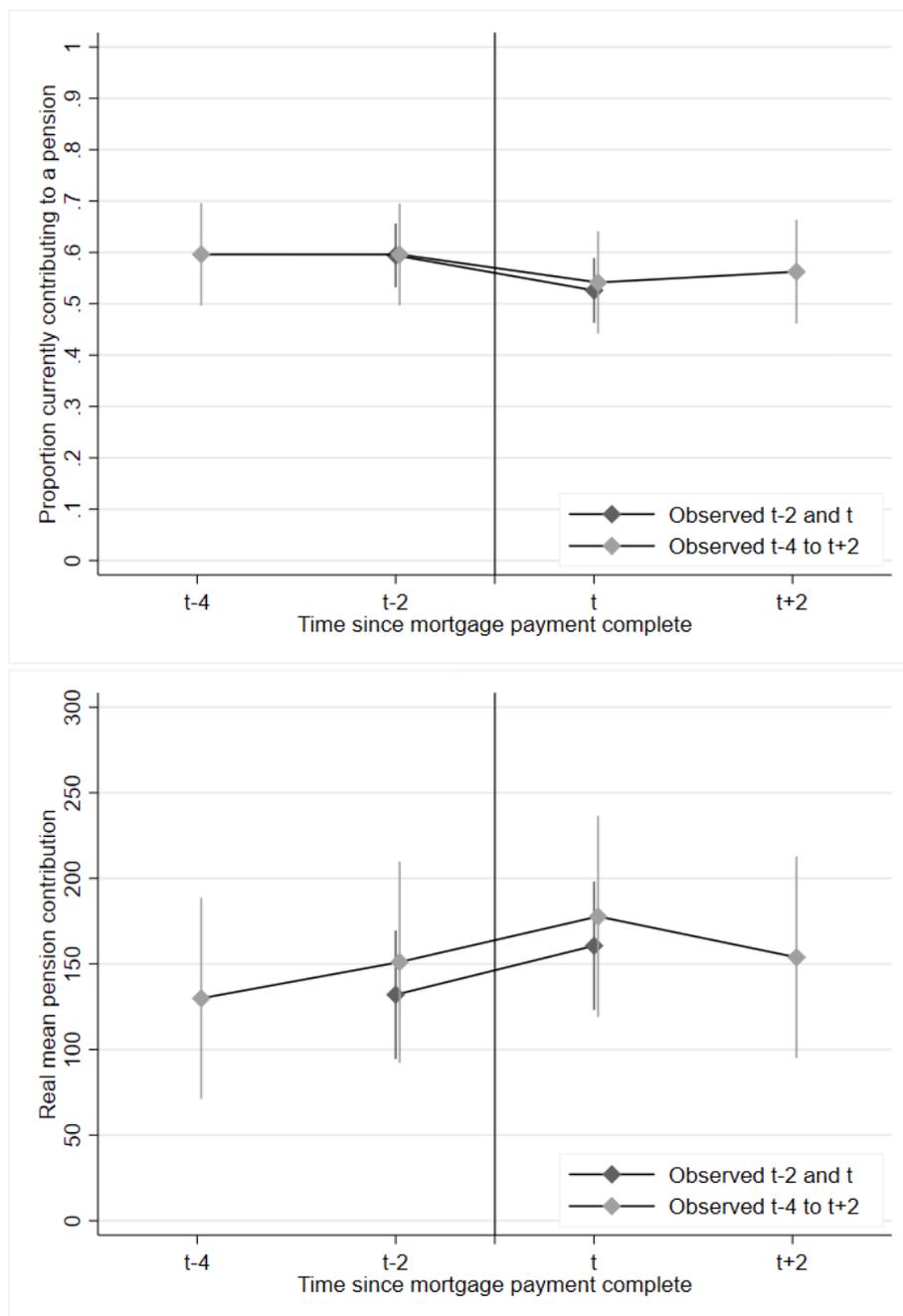
Figure 4 illustrates the prevalence and level of pension saving among our sample around the time that mortgage repayment is completed. The first panel shows that around 60% of the sample makes contributions to a private pension.⁶ There is little suggestion that pension membership increases when mortgages are completed; if anything, pension membership seems to fall at that point. The second panel illustrates mean pension contributions (calculated including zeros for those who are not contributing to a private pension). Average pension contributions are higher in the wave immediately after mortgage completion than in the wave before. However, they are also higher in the wave immediately before mortgage completion than two waves prior. Furthermore, the error bars indicate that there is a lot of variability in pension contributions and therefore differences in the average contribution over time could just be a result of noise in the data.

Examining more directly the changes in pension saving at the point at which mortgages are completed, the first column of Table 3 describes the proportion of individuals moving into and out of private pension saving and the distribution of the change in individuals' pension contributions. The second and third column provide, for comparison, the changes in pension saving for the same individuals if they are observed in consecutive surveys before completing their mortgage (column 2) or if they continue to be observed after that point (column 3). The mean change in pension saving around the point mortgages are repaid is an increase of £26 per month. However, there is considerable variation, with one in four individuals reducing pension saving by £12 or more per month and one in four increasing pension saving by £11 or more. Some large increases and decreases in pension contributions will be associated with individuals starting and stopping saving: 5% of individuals started saving at this point, while 10% stopped saving.

This simple descriptive analysis suggests that most individuals are not increasing pension saving by a significant amount at the point when their mortgage is repaid. An overall increase in average pension saving of £26 per month is small compared to the average £231 (per person) monthly mortgage repayment that ceases at that point.

⁶ It should be kept in mind here that the sample excludes those who do not know the level of their pension contributions – without this restriction, around 70% of the sample are actively contributing to a private pension.

Figure 4. Pension saving around the time of mortgage completion



Note: Those observed in $t - 2$ and t in our full sample ($N = 242$). Those observed in the period $t - 4$ to $t + 2$ are the subsample who are observed in two consecutive surveys prior to mortgage completion and two consecutive surveys immediately afterwards ($N = 96$).

Table 3. Distribution of wave-to-wave changes in pension saving

	Complete repayment	Remain owning outright	Remain with mortgage
<i>Change in monthly pension contributions (£):</i>			
Mean	26	-16	1
10 th percentile	-154	-106	-104
25 th percentile	-12	-22	-5
Median	0	0	0
75 th percentile	11	10	16
90 th percentile	147	114	112
<i>Percentage of the sample who:</i>			
Continue contributing	47.5	53.2	51.5
Start contributing	5.1	4.8	4.6
Stop contributing	9.9	8.1	6.0
Continue to not contribute	37.5	33.9	37.9
Observations	242	271	361

4. Regression analysis

Empirical approach

To examine more formally whether pension saving changes when individuals complete repayment of their mortgage, we use regression analysis. As described in Section 2, our sample consists of those individuals aged between 50 and their SPA, who were in work, who knew their level of pension contributions both before and after the completion of their mortgage repayment, and who are observed completing their mortgage at some point between 2004/05 and 2018/19. These individuals are observed, in two consecutive surveys, between one and six times each – once when they complete their mortgage repayment, and sometimes before (when they had a mortgage in consecutive surveys) and sometimes after (when they owned outright in consecutive surveys). These observations of individuals in periods when their mortgage expenses did not change act as ‘controls’, allowing us to isolate the effect of mortgage completion on pension saving, over and above that which typically occurs anyway among these individuals.

We use the following three empirical specifications.

First, we conduct ordinary least-squares (OLS) regression, examining the association between the change in pension contributions and whether an individual has completed repayment of their mortgage over that two-year period. Formally,

$$y_{it} - y_{it-2} = \alpha + \beta'X_{it} + \gamma MO_{it} + \delta OO_{it} + \varepsilon_{it}, \quad [1]$$

where $y_{it} - y_{it-2}$ is the change in pension contributions between wave $t - 2$ and t , MO_{it} is a dummy variable for whether the individual completes repayment of their mortgage between $t - 2$ and t , and OO_{it} is a dummy variable for whether the individual owns outright in both $t - 2$ and t . In addition, we include survey-year dummies and control for several individual characteristics, X_{it} : age, gender, whether in a couple and how that has changed between t and $t - 2$, and the change in real earnings between t and $t - 2$. The coefficient of interest is γ , which indicates by how much pension saving changes when a mortgage is completed, compared with when a mortgage continues, holding constant individual characteristics. (Note that $\gamma - \delta$ indicates by how much pension saving changes when a mortgage is completed, compared with when an individual continues to own outright.)

Second, we examine the association between the change in pension contributions and the change in mortgage expenditures over the same period. Formally, using OLS we estimate

$$y_{it} - y_{it-2} = \alpha + \beta'X_{it} + \theta(M_{it} - M_{it-2}) + \varepsilon, \quad [2]$$

where $y_{it} - y_{it-2}$ is again the change in pension contributions between wave $t - 2$ and t and $M_{it} - M_{it-2}$ is the change in mortgage payments. For those who have a mortgage in both t and $t - 2$, or who own outright in t and $t - 2$, $M_{it} - M_{it-2}$ is set to zero. (Empirically, there are in fact some changes in real mortgage expenditures for those who have a mortgage in both periods, as a result of a combination of many mortgages being fixed in nominal terms, changes in mortgage repayments due to variable interest rates or re-mortgaging, and measurement error.) The coefficient of interest is θ .

Third, we examine a specification where we estimate the association between mortgage completion and the probability of an individual increasing their pension contributions by more than a particular amount. Given the variability of pension contributions in the data, this specification is more easily able to identify whether a relatively small number of individuals increase their contributions by larger amounts. Formally, we estimate a probit model,

$$\Pr(\Delta y_{it} > \varepsilon K) = \alpha + \beta'X_{it} + \gamma MO_{it} + \delta OO_{it} + \varepsilon, \quad [3]$$

where $\Pr(\Delta y_{it} > \varepsilon K)$ is the probability that the individual increased their pension contributions by more than εK per month between time $t - 2$ and t . We examine four thresholds for K : £50, £100, £150 and £200. The other variables are as defined above. The coefficients of interest are again γ and $\gamma - \delta$.

Results

The results of estimating specifications [1] and [2] are set out in Table 4 (columns 1 and 2, respectively). The results in column 1 indicate that completion of the repayment of a mortgage is associated with a £34 greater increase in monthly pension contributions, compared with when an individual continues to pay a mortgage. However, this difference is not statistically different from zero.

Table 4. Estimated association between change in monthly pension contributions and mortgage completion or change in mortgage expenditure

	[1]	[2]
Complete mortgage (γ)	33.78 (40.66)	
Continue to own outright (δ)	0.03 (22.82)	
Change in mortgage (θ)		0.09 (0.15)
Female	-46.32** (22.17)	-54.82** (26.61)
Aged 55-59	-122.20* (65.18)	-130.48** (64.66)
Aged 60+	-135.51** (64.78)	-136.51** (66.10)
Remain single	11.31 (30.45)	20.08 (32.51)
Become single	42.55 (72.21)	40.18 (68.08)
Become couple	19.76 (38.50)	29.70 (41.63)
Change in real earnings (£ per month)	-0.04 (0.05)	-0.04 (0.06)
Exclude outliers	✓	✓
<i>N</i>	907	898

Note: Coefficients (standard errors in parentheses) from OLS regressions. Regressions additionally include survey-year dummies. Standard errors are clustered at the individual level. Sample size for specification [2] is smaller than for specification [1] because of individuals missing mortgage expenditure. Observations where pension contributions change by more than +/- £40,000 per year are excluded. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

The results in column 2 highlight that the change in pension contributions is very small in the context of the level of expenditure on mortgage repayments: on average, a £1 reduction in mortgage spending is associated with only a 9p increase in pension contributions (not statistically different from zero).

The results of estimating the association between mortgage completion and the probability that an individual will increase pension contributions by a particular amount (specification [3] above) are set out in Table 5. The columns present the results of alternative regression specifications where different increases (in £) in pension contributions are considered. Completion of mortgage repayment is associated with a significant increase in the probability of increasing monthly pension contributions by more than £100, by more than £150 and by more than £200. Specifically, the probability of increasing monthly pension contributions by £150 or more is 5 percentage points greater among those who complete their mortgage than among those who continue repaying a mortgage.

Table 5. Estimated association between the probability of increasing pension contributions and mortgage completion

	Pr(Δy_{it} > £50)	Pr(Δy_{it} > £100)	Pr(Δy_{it} > £150)	Pr(Δy_{it} > £200)
Complete mortgage (γ)	0.027 (0.035)	0.064** (0.032)	0.054** (0.027)	0.036* (0.021)
Continue to own outright (δ)	-0.005 (0.045)	0.040 (0.043)	0.044 (0.040)	0.050 (0.040)
Female	-0.099*** (0.034)	-0.073** (0.029)	-0.050** (0.024)	-0.022 (0.022)
Aged 55–59	-0.078 (0.062)	-0.075 (0.056)	-0.029 (0.045)	-0.064 (0.045)
Aged 60+	-0.166** (0.072)	-0.140** (0.065)	-0.077 (0.051)	-0.083 (0.052)
Remain single	-0.010 (0.047)	-0.004 (0.035)	-0.006 (0.032)	0.018 (0.031)
Change in real earnings (£)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
<i>N</i>	897	897	897	897

Note: Average marginal effects (standard errors in parentheses) estimated from probit regressions. Regressions additionally include survey-year dummies. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Observations where pension contributions change by +/- £40,000 per year are excluded.

This indicates that, even among our selected sample of individuals who are below their SPA and in work when they repay their mortgage and who know their pension contributions, there is only a small minority of individuals who do respond to the completion of their mortgage by changing their pension contributions. Furthermore, the effect is greatest for pension contributions of more than £100, and reduces when larger increases in contributions are considered. This suggests that even these responsive individuals (assuming that their mortgage repayments were similar to the average) do not increase their pension contributions to the extent that their mortgage expenses have fallen.

5. Discussion and conclusions

In this paper, we have produced the first empirical estimates of the extent to which owner-occupiers change their private pension saving when they complete repayment of the mortgage on their primary residence. For our sample of English workers in their 50s and 60s, who finish repaying their mortgage in line with the remaining mortgage term reported two years previously, there is little change in average private pension contributions associated with the ceasing of mortgage repayments. This is because only a minority of individuals react: only 5% of individuals increase their monthly private pension contributions by £150 or more as a result of completing repayment of their mortgage.

Furthermore, even these amounts are somewhat lower than average mortgage expenditures per person prior to mortgage completion (mean £344 per month). While our sample is restricted by necessity to those who know the level of any pension contributions made, it is not clear whether these individuals would be expected to be more or less likely to change their pension saving behaviour on mortgage completion.

Of course, because of intra-household pooling of resources, not all individuals would be expected to respond to mortgage completion by increasing their pension saving. It may be that one individual increases pension saving on behalf of the couple, for example because they benefit from greater tax relief, or a higher employer match rate, or because there are fixed costs of changing contribution levels. However, even if there is a response by only one individual in any couple where both partners are working and aged under the SPA, we would expect around two-thirds of our sample to increase their pension saving on completion of their mortgage, given the household composition of the sample.

In some sense, the lack of an effect on pension saving is surprising. The LCPIH predicts that consumption should be smooth around mortgage completion, and unless individuals are adjusting the timing of their mortgage repayment to suit their pension saving decisions (in other words, the timing of mortgage completion is not exogenous), or they prefer to save for retirement in non-pension assets, one would expect private pension saving to increase at that point. One might also expect mental accounting type behaviours to lead to such an effect, if individuals turn to focus on pension saving after they have finished purchasing their house.

However, there are a number of reasons why not everyone might be expected to respond to mortgage completion by increasing pension saving. Those on lower lifetime incomes have less need to save for retirement through private pensions (as the state pension provides them with a greater replacement of their earnings than it does for middle and higher earners). Alternatively, those with employer-provided private pensions may contribute according to proscribed or default contribution levels, and they might not change their contributions from these levels – either because they have explicitly considered their retirement benefits and deem their likely income to be adequate or because they simply interpret the default contribution levels as the recommended or appropriate level of saving. The private pension saving decisions of these individuals would be less responsive to other expenditure patterns such as mortgage payments.

Future research in this area would be beneficial. In particular, there are at least two dimensions that would benefit from further exploration. First, whether similar results are found for individuals who pay off their mortgages earlier in working life. These individuals may have larger real terms mortgage expenditures prior to mortgage completion, and so see a greater change in their disposable income at the point the mortgage is repaid. They may also be at a different stage of life in terms of thinking about their retirement saving. Second, to the extent that individuals do not change their pension saving decisions when mortgages are repaid, this raises a question about what individuals do with the income that is no longer being devoted to repaying mortgages. Prior literature in the United States (Coulibaly and Li, 2006; Scholnick, 2013) found some increases in financial savings and some aspects of durable spending, but these did not account for the full reduction in mortgage spending, and it is an open question whether similar effects would be found in the United Kingdom.

Notwithstanding the answers to these unknowns, it remains the case that policymakers are concerned about individuals having inadequate incomes in retirement, and the empirical evidence in this paper suggests that current behaviour is for few to increase pension saving when they complete repayment of their mortgages. Policymakers may therefore wish to consider targeting policies that aim to increase private pension saving towards individuals who are at this stage of the life course. Those completing repayment of their mortgage would be able to increase pension saving without reducing their spending from its recent levels, which may increase the tractability of policy nudges to increase saving.

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