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# **Understanding pension saving among the self- employed**



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and Social  
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# Preface

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# Executive summary

Private pension saving among the self-employed population in the UK has been falling dramatically over the last few decades, and this has led to a heightened policy focus on how to boost pension saving among this group. In this report we analyse patterns of private pension saving among the self-employed using administrative tax data. We focus on a specific group of the self-employed – those who are working-age (age 22–64), long-term self-employed (self-employed for at least five consecutive years) and have no income from a job as an employee.

## Key findings

- 1 Private pension participation among the self-employed has been falling over time. Amongst the long-term working-age self-employed, it fell from 33% in 2005–06 to only 14% in 2014–15.** This compares with 57% of working-age private sector employees saving in a workplace pension in 2014–15 (and 81% in 2020–21).
- 2 Some of the self-employed will be well served in retirement by the state pension: about a third had incomes below £10,000 per year in 2014–15, and a full single-tier pension is now worth almost that amount. However, the differences in incomes between the self-employed and private sector employees cannot fully explain the differences in pension participation rates between these two groups.** Comparing pension participation rates of the self-employed and private sector employees across the earnings distribution, we find that in 2014–15 the pension participation rate among the self-employed was lower than among employees at all earnings levels above £5,000 per year.
- 3 The gap between pension participation rates of private sector employees and the self-employed of the same earnings has widened since the introduction of automatic enrolment,** especially among those on low to middle earnings. In 2014–15, the pension participation rate among employees earning £30,000 per year was around 60%, compared to 20% among self-employed workers of the same earnings level.

- 4 **Self-employed people tend to have more volatile incomes than employees,** and it has been argued that this can lead to a pattern where the self-employed switch into and out of pension saving based on whether they are having a ‘good’ or a ‘bad’ income year. We find that having more volatile income is associated with an increased likelihood of both leaving and entering pension saving. **However, we do not find evidence for the self-employed moving regularly into and out of pension saving over time – over a 5-year period, 87% do not change their pension participation status between years.**
- 5 **Nearly a quarter of the self-employed who are saving into a pension choose the amount to save as a monthly or annual round number in nominal pound terms, with the most common (modal) amount being £50 per month (or £600 per year).** This is in contrast to employees who most commonly choose their contribution level based on a percentage of earnings. Choosing round amounts is more common among the lower-earning self-employed, with more than a third of those with the lowest earnings saving round numbers, compared with 13% of those with earnings around £100,000. This suggests that those with fewer financial resources and potentially lower levels of financial knowledge are more likely to choose their level of contributions this way.
- 6 **Many of the self-employed who save in a pension rarely change the nominal contribution amounts they make – nearly half (49%) of those saving in two consecutive years are saving the same amount a year later. Among those who are still saving in a pension 9 years later, close to a quarter (23%) save the same amount in cash terms.** Similar to the pattern we saw with saving round nominal amounts, saving exactly the same amount year after year is more common among those with lower incomes. The round and constant cash contributions amounts do not seem to correspond to constant cash incomes – the distribution of contributions expressed as percentage of income appears smooth.
- 7 **Of those who continue saving into a pension over time, those who were initially saving a round amount in cash terms are even more likely to be saving the same amount several years later. Sixty per cent of these people are still saving exactly the same cash amount nine years later.** Over the period we study, this implied a 20% fall in the real value of contributions. With current high inflation rates, that fall would now be far larger.

- 8 We study whether the pension saving behaviour of the self-employed responds to the change in the upfront incentive to save into a pension at the higher-rate tax threshold. We find that the change in the tax incentive to save in a private pension increases pension participation among the self-employed by 3 percentage points around the higher-rate tax threshold, from a base level participation rate of about 40%. We also find an average increase in saving of £100 per year among those saving in a private pension, from an average contribution level of £2,000 per year around the higher-rate tax threshold. While these responses are sizeable, in particular in comparison to employees, **the magnitude of these effects suggests that this specific upfront tax incentive alone is unable to deliver a large increase in pension saving among the self-employed.**
- 9 The low levels of pension participation among self-employed workers mean that **the key policy challenge for the government at the moment is to encourage people to engage with the private pension system and start saving into a pension.** This is particularly true for those of the self-employed who are self-employed for larger parts of their working lives, as they will have less opportunity to save in a workplace pension and therefore risk not having adequate resources in retirement otherwise.
- 10 Overall, the findings from this report, as well as existing research, suggest that **in order to increase the pension participation rates of self-employed workers meaningfully, new innovations on how to incorporate pension saving defaults for the self-employed as part of the tax system are needed.** However, given that a large proportion of the self-employed are very low earners, any pension saving policies for the self-employed should make sure to target those of the self-employed who can actually afford to make contributions and are at most risk of seeing a large decline in their living standards at retirement in the absence of private saving.
- 11 Among the self-employed savers, the fact that the cash value of contributions is unchanged year after year implies that a **form of auto-escalation could be a good way to boost their pension savings,** for example using a direct debit that increased in line with inflation, or at another pre-set rate. This would help to ensure that contributions do not fall in real terms over time.

# 1. Introduction

The number of self-employed workers in the UK grew rapidly in the decades leading up to the Covid-19 pandemic – increasing from 3.3 million people in 2001 to 5 million people in 2019.<sup>1</sup> At the same time, the probability of saving for retirement into a private pension among this group declined dramatically. Previous analysis using household survey data (the solid line in Figure 1.1) shows that in the financial year 2018–19 only 16% of the working-age self-employed were saving into a private pension (as discussed in Crawford and Karjalainen, 2020). Analysis using administrative tax data (the dotted lines in Figure 1.1) shows that only 14% of working-age people who had been self-employed for at least 5 years, and 11% of all working-age self-employed, were saving in a pension in 2014–15 (Karjalainen, 2023).

Most workers – particularly those on middle and higher incomes – will need to undertake private saving for retirement in order to be able to afford a standard of living in retirement that is commensurate with their living standards during working life. For employees, automatic enrolment has caused a large increase in workplace pension membership since 2012 (Cribb and Emmerson, 2020). Automatic enrolment, which defaults employees earning above £10,000 per year into saving into a workplace pension, more than reversed the pre-2012 declining trend of workplace pension membership among employees. As the blue dashed line in Figure 1.1 shows, the workplace pension participation rate among working-age private sector employees increased from 38% in 2012–13 to 81% in 2020–21.<sup>2</sup> For more detail on pension saving of employees over the life cycle, see Cribb and O’Brien (2023).

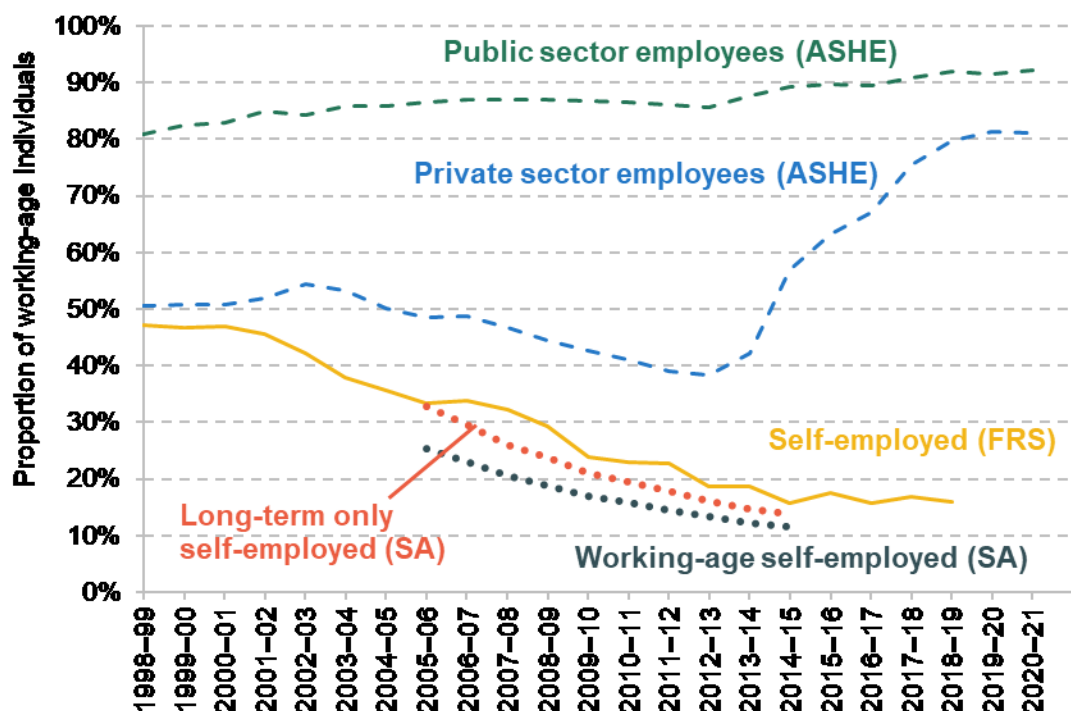
However, automatic enrolment does not apply to the self-employed as, by definition, they do not have an employer who could automatically enrol them and make contributions on their behalf. Thus, the question of how to deliver more pension saving among the self-employed has been gaining a great deal of attention from policymakers.

<sup>1</sup> Office for National Statistics, 2018 and Blackburn et al., 2022.

<sup>2</sup> These figures refer to participation in workplace pensions – in other words, pension schemes that are run or facilitated by employers.



Figure 1.1. Private pension participation among working-age employees and self-employed



Note: The solid line is reproduced from Crawford and Karjalainen (2020) and is calculated using Family Resources Survey (FRS) data from 1998–99 to 2018–19, where years are financial years. In FRS data, the definition of self-employment is based on self-reported employment status. The dotted lines are from Karjalainen (2023) and are calculated using HM Revenue and Customs (HMRC) Self Assessment data. The sample is working-age individuals (defined as aged 22–64). ‘Long-term only self-employed’ refers to those who have been self-employed for at least 5 years with no employment income. The dashed line (for employees) is from Annual Survey of Hours and Earnings (ASHE) data (measured each April).

Source: Crawford and Karjalainen (2020) and authors’ calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15 and ASHE data for 1998–2020.

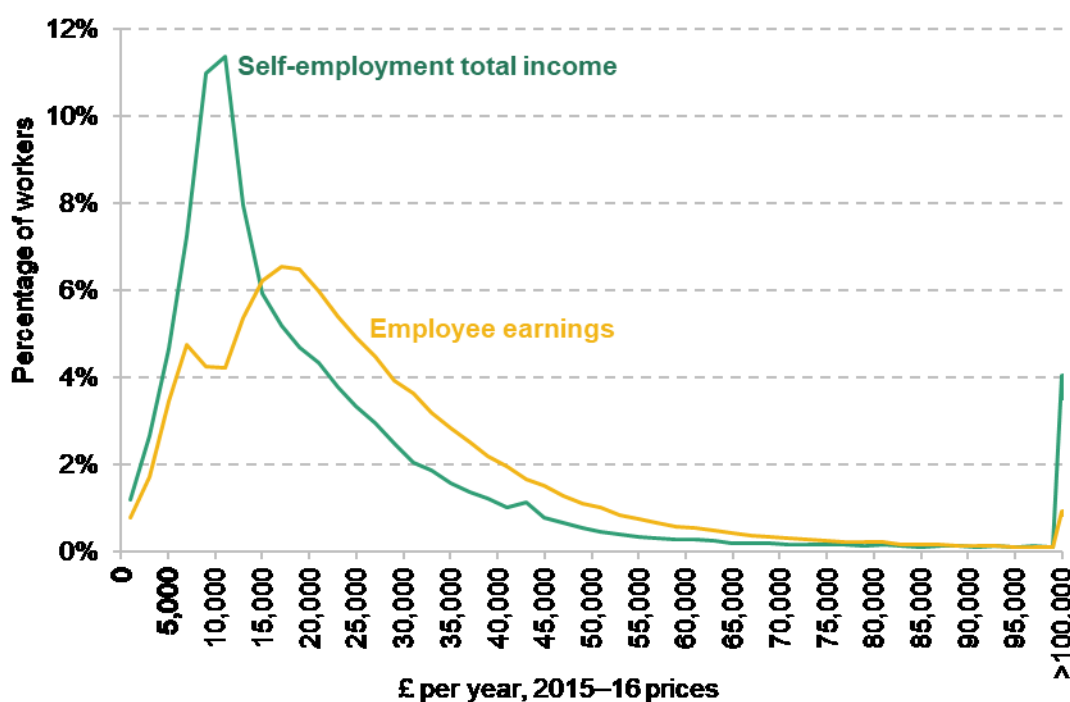
One of the potential reasons for differences in saving behaviour between employees and the self-employed is that these two groups are very different in terms of their characteristics, such as their earnings. Figure 1.2 shows that self-employment earnings are on average considerably lower than earnings among employees. For example, in 2014–15, 52% of the self-employed had earnings below £15,000, compared to 31% of employees, and about a third of the self-employed had annual earnings of less than £10,000.<sup>3</sup>

The pension saving of the self-employed earning less than £10,000 per year may be less of a concern for policymakers – even as employees they would not be required to be automatically enrolled, and the new state pension (worth £9,600 per year in 2021–22 for someone entitled to the full pension) on its own provides a high income replacement rate in retirement for this level

<sup>3</sup> We express all pound amounts in this report in 2015–16 prices, in line with the latest tax year of HMRC data we had available for this analysis.

of earnings. On the other hand, the proportion of high earners is also greater among the self-employed than among employees – 4% of the self-employed have incomes above £100,000, compared with 1% of employees.

**Figure 1.2. Pre-tax annual earnings distribution of private sector employees and the self-employed in 2014–15**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Self-employment income includes all gross income from self-employment, as well as other sources. Employee earnings includes gross employment earnings only.

Source: Authors' calculations using ASHE and HMRC Self Assessment data for financial year 2014–15. In 2015–16 prices.

In order to consider effective policies for increasing pension saving among the self-employed, it is important to have an understanding of patterns and drivers of saving behaviour among them. This is the focus of this report. For most of the analysis we use administrative tax records from HM Revenue and Customs (HMRC). Nearly all self-employed people in the UK are required to submit a tax return called 'Self Assessment' for each tax year that they are in business. The form records income from all sources, and the self-employed are also asked to report any pension contributions they have made to pension schemes. This data set covers the whole population of sole traders and partners in the UK over the period from 2005–06 to 2014–15, and we can follow people over time as observations are linked using a taxpayer identifier. Further detail on the data set can be found in Appendix 1 of Karjalainen (2023). Appendix 1 of the present report

discusses the extent to which we may expect misreporting of incomes or pension participation in the Self Assessment data.

In a similar way to Karjalainen (2023) – which specifically examined whether the fall in private pension saving for the self-employed is driven by the changing composition of the workforce and found that the changing characteristics only account for around a third of the decline in pension participation of the self-employed – in this report we focus on a specific sample of the self-employed: those who are working-age (age 22–64), long-term self-employed (self-employed for at least five consecutive years), and have no employee income. It is important to focus on those without employee income as we cannot observe much of the pension contributions made by employees (or by their employers on their behalf) in this data set. For computational purposes, we use a 10% random sample of the full population sample. Further detail on the number of observations and characteristics of the sample over time can be found in Karjalainen (2023), in particular Section 2, Appendix 2, and Appendix 4.

In this the report we also examine to what extent there are important differences in the saving patterns of self-employed men and women. We refer to these differences throughout the report, and Appendix 3 contains many of the key charts of this report shown separately for men and women.

This report is structured as follows. In Section 2 we document pension participation and contributions across the earnings distribution among both the self-employed and employees, to assess to what extent saving rates differ among employees and the self-employed with similar levels of earnings. We also analyse the distribution of pension contributions among self-employed who are saving into a pension. In Section 3 we examine the age profiles of saving, and document how often, when and how the self-employed change their pension saving (both participation status and contributions). In Section 4 we look into how the self-employed respond to tax incentives of pension saving. Section 5 provides a conclusion.

## 2. How much do the self-employed save in private pensions?

In this section we examine patterns of private pension participation and private pension contributions among the self-employed. We find that the self-employed are less likely to save into a private pension than employees with similar earning levels across almost the whole earnings distribution, and thus the differences in pension saving between the two groups cannot be explained by income differences alone. We also examine the distribution of pension contributions among the self-employed who are saving into a pension, and find that many of the self-employed choose their contributions based on round monthly or annual amounts.

### Key findings

- 1 **In 2014–15, the private pension participation rate among the self-employed was lower than among employees at all earnings levels above £5,000 per year.** This shows that the differences in earnings of the self-employed and employees cannot fully explain the differences in pension participation rates between these two groups.
- 2 **The gap between pension participation rates of employees and the self-employed with the same level of earnings has widened since the introduction of automatic enrolment,** especially among those on low to middle earnings. In 2014–15, the pension participation rate among employees earning £30,000 per year was around 60%, compared to 20% among self-employed workers of the same earnings level.
- 3 **For those who do save into a pension, when comparing those with similar earnings, average employee contribution rates of employees are lower than average contribution rates of self-employed people.** However, when taking into account the employer contributions made on behalf of employees, the total contribution rates of employees are higher than the contribution rates of the self-employed among those in the middle of the distribution with earnings between £20,000 and £60,000 per year. For example

for those with earnings around £45,000 per year, the difference in contributions rates is 4 percent with employees contributing on average 11% of earnings and self-employed on average 7% of income.

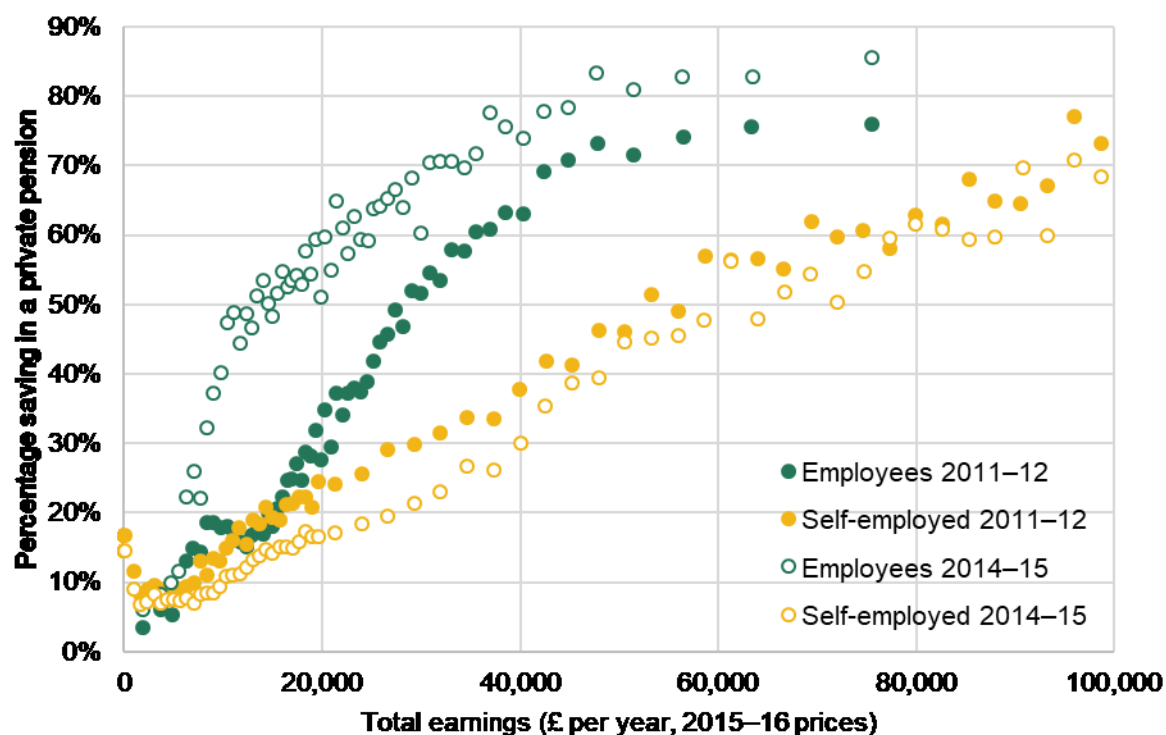
- 4 Therefore, **compared to employees of similar earnings, middle-earning self-employed workers are much less likely to be saving into a pension, and even conditional on saving into a pension are saving on average a smaller proportion of their earnings.**
- 5 **Nearly a quarter of the self-employed who are saving into a pension choose the amount to save as a monthly or annual round number in nominal pound terms, with the most common (modal) amount being £50 per month (or £600 per year).** This is in contrast to employees, who most commonly choose their contribution level based on a percentage of earnings. Choosing round amounts is more common among the lower-earning self-employed, with more than a third of those with the lowest earnings saving round numbers, compared to 13% of those with earnings around £100,000. This suggests that those with fewer financial resources and thus potentially lower levels of financial knowledge are more likely to choose their level of contributions this way.

## 2.1 Private pension participation

As described in Section 1, private pension participation rates are considerably higher among employees than among the self-employed. However, we also know that earnings are on average lower among the self-employed than among employees (as shown in Section 1 as well as, for example, in Cribb, Miller and Pope, 2019), and that pension participation increases with income (see, for example, Crawford and Karjalainen, 2020). Some of the differences in pension participation rates between employees and the self-employed will therefore be explained by differences in earnings. Figure 2.1 shows the proportion of private sector employees and the self-employed saving into a private pension by level of earnings.<sup>4</sup> The filled dots show the data for 2011–12, before automatic enrolment was introduced for employees, and the open dots show the data for 2014–15 (the latest HMRC data available, part-way through the roll-out of automatic enrolment).

<sup>4</sup> In Section 2.1 and 2.2 when referring to earnings, for the self-employed this refers to total gross income, whereas for employees this refers to gross employment earnings only.

Figure 2.1. Proportion of self-employed workers and private sector employees saving in a pension by earnings



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Self-employment income includes all gross income from self-employment. Employee earnings include gross employment earnings only. The data points are not fully aligned because their location is based on the actual mean income among the people in that bin.

Source: Authors' calculations using ASHE data for financial years 2011–12 and 2014–15, and HMRC Self Assessment data for 2011–12 and 2014–15. In 2015–16 prices.

Figure 2.1 shows that the likelihood of saving into a pension is generally increasing with earnings for all groups and in both periods, with the exception of the self-employed with earnings less than about £3,000 per year. For example, the pension participation rate in 2014–15 among the self-employed earning £20,000 a year was 17%, compared to 30% among those earning £40,000 per year. However, when comparing private sector employees and the self-employed, we can see that the self-employed are considerably less likely to save into a pension across almost the whole earnings distribution (although at lower levels of the earnings distribution – below around £15,000 per year – in 2011–12 the saving rates look much more similar). Using the example above, the pension participation rate among private sector employees earning £20,000 a year was 60% in 2014–15, some 43 percentage points higher than among the self-employed earning the same amount, whereas among employees earning £40,000 per year the pension participation rate was 74%, which is 44 percentage points higher than among self-employed individuals with the same level of earnings.

Since the introduction of automatic enrolment, the gap in participation rates of private sector employees and the self-employed has opened up at lower earnings levels. Before automatic enrolment the proportion of people saving into a pension was similar for the self-employed and private sector employees earning less than about £20,000, but after automatic enrolment the gap widened for those with earnings above about £5,000 per year. The gap in pension participation rates between employees and the self-employed has also grown at higher levels of earnings – for example, in the latter period among those with annual earnings between £30,000 and £40,000 the gap in in pension participation rates was between 40 and 50 percentage points, whereas before automatic enrolment the gap was between 22 and 27 percentage points at these levels of earnings.

Overall, these differences in pension participation rates of employees and the self-employed with similar earnings levels suggest that differences in earnings of the self-employed and employees cannot fully explain the differences in pension participation rates.<sup>5</sup> This is true before the introduction of automatic enrolment and even more so after it.

## 2.2 Contributions among those participating in a private pension

### Contributions compared to private sector employees

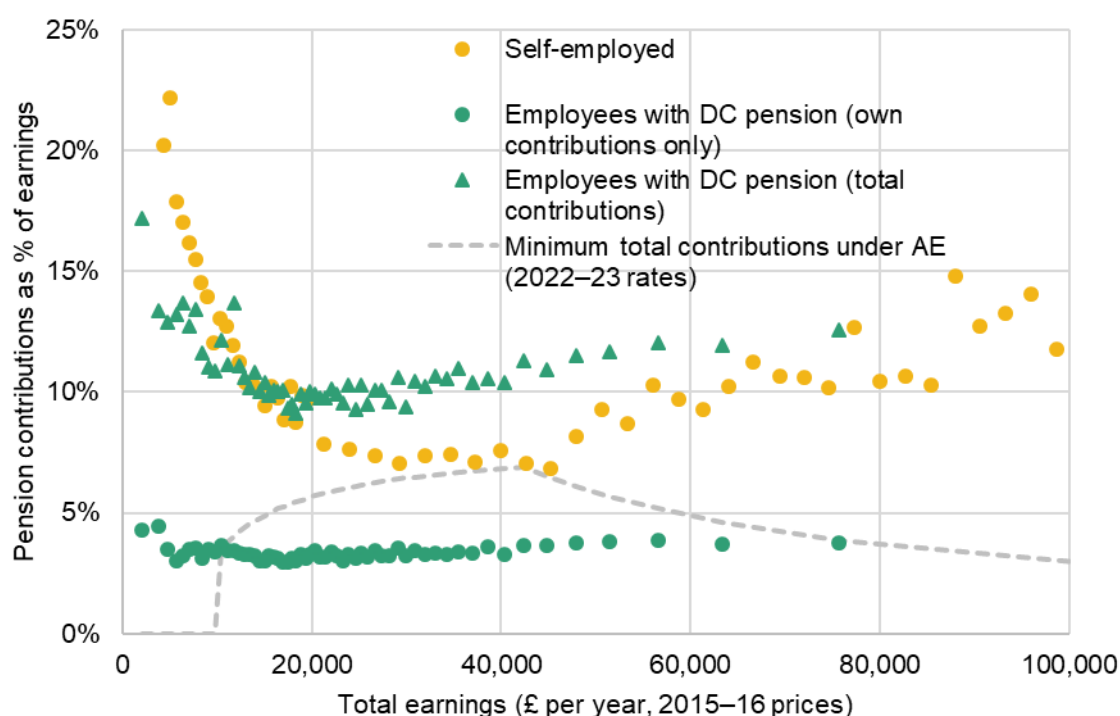
Figure 2.1 shows that the self-employed are less likely to be saving into a pension across nearly the whole earnings distribution. We now focus on those of the self-employed who save into a pension, to look at the distribution of contributions among them and to assess how they compare with private sector employees with similar earnings.

In this part of the analysis we focus on employees with defined contribution pensions only – defined contribution pensions are more similar to the kind of pensions available to the self-employed as they allow the individual to choose their saving rates. We also use data from before automatic enrolment (2011–12) as this is more indicative of the kind of saving decisions that employees would have made without the nudge of automatic enrolment (which brought many employees into workplace pension schemes saving at relatively low levels of contributions).

<sup>5</sup> When comparing self-employed men and women, we know that women's pension participation rates are lower (Karjalainen, 2022), and that women's earnings are lower (Figure A3.1). However, when comparing participation rates of self-employed men and women conditional on earnings level, the rates look very similar (Figure A3.2). This implies that income differences can explain much of the gender gap in pension participation rates among self-employed workers.

Figure 2.2 shows the mean pension contribution rates (as a percentage of total earnings) by level of total earnings, for the self-employed and employees who are currently participating in a private pension. For employees we show both the employee contributions (the proportion of earnings saved by the employee) and total contributions, which also takes into account employer contributions. The grey dashed line shows the level of minimum total contributions under current automatic enrolment legislation (8% of qualifying earnings, i.e. earnings between £6,240 and £50,270 for those earnings above £10,000 per year) as a share of earnings.

**Figure 2.2. Mean contribution rates by earnings, among savers (2011–12)**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Self-employment income includes all gross income from self-employment. Employee earnings includes gross employment earnings only. The contribution rates are winsorised at the 99th percentile. DC = defined contribution. AE = automatic enrolment. The minimum total contributions are 8% of earnings between £6,240 and £50,270 for those earnings above £10,000 per year.

Source: Authors' calculations using ASHE data for financial year 2011–12 and HMRC Self Assessment data from 2005–06 to 2014–15. In 2015–16 prices.

Figure 2.2 shows that, conditional on being a saver, the saving rates of the self-employed are initially falling as a proportion of earnings (from more than 20% to about 7% of earnings), and start to rise for those with earnings above £40,000 per year. For employees, saving rates are slightly more stable across the distribution, although total contribution rates do also initially fall with earnings.



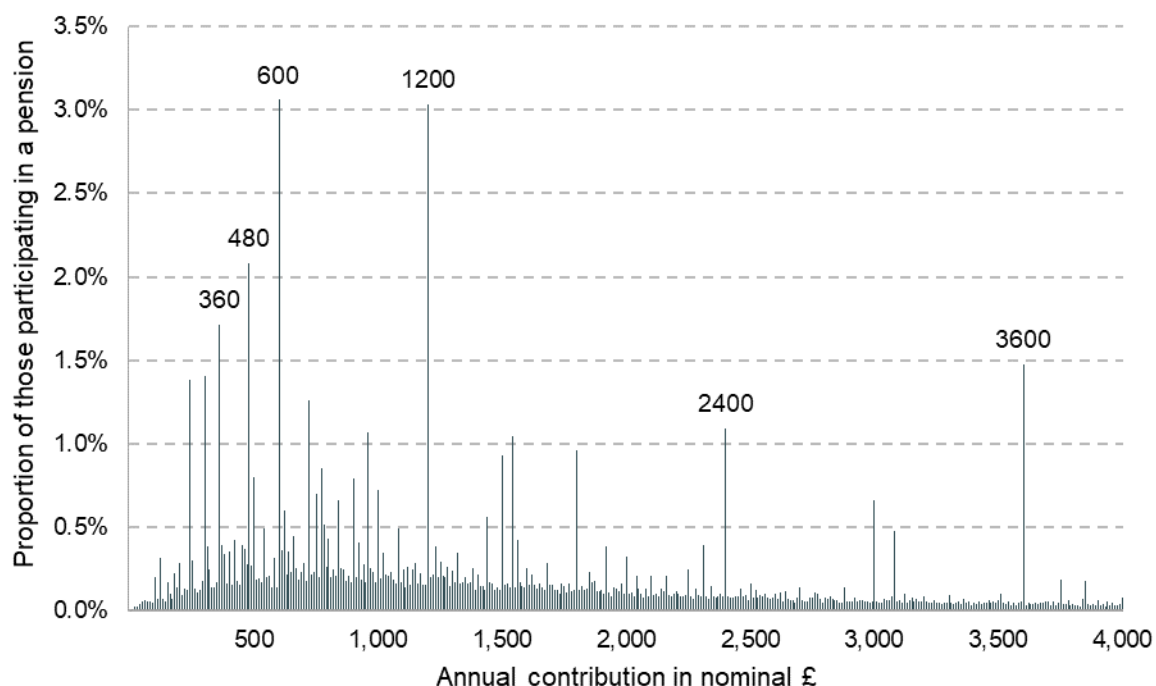
Comparing the level of contributions among employees and the self-employed, we see that employee contributions are much lower (below 5%) than self-employed contributions across the whole earnings distribution. However, a more appropriate comparison is to look at both employee and employer contributions for employees, as this is the total amount that is saved into their pension. When focusing on total contributions, we see that mean contribution rates (among savers) are higher or similar for the self-employed compared with employees earning below £20,000 and above £60,000 per year, but contribution rates are higher for employees in the middle of the earnings distribution – for example, the gap in saving rates of employees and the self-employed saving into a pension is about 4 percent of earnings among those with earnings around £45,000. Therefore, compared to employees of similar earnings, middle-earning self-employed workers are much less likely to be saving into a pension, and even conditional on saving into a pension are saving on average a smaller proportion of their earnings.<sup>6</sup> It is worth noting that among the self-employed saving into a pension, the average contribution rates are still higher at all levels of earnings than what they would be under the minimum contribution rates under automatic enrolment.

## Distribution of contributions

Employees making contributions to a workplace pension tend to choose their pension contributions as a percentage of pensionable pay, and it is expected that as pay changes, pension contributions would therefore automatically change with them. Given that cash earnings are more likely to rise rather than fall over time, pension contributions – in cash terms – will also be more likely to increase than fall as a result of this link. However, for the self-employed there is no automatic mechanism that would help set saving rates in this way. Figure 2.3 shows the distribution of nominal pension contributions (without adjusting for inflation) among the self-employed, pooling data from 2005–06 to 2014–15.

<sup>6</sup> Conditional on earnings, self-employed men and women make similar contributions as shown in Figure A3.3. It seems that self-employed women save a little more, especially among those earning more than £20,000 per year, but the differences between genders (conditional on income) are very small.

**Figure 2.3. Distribution of nominal pension contributions among the self-employed, pooling data from 2005–06 to 2014–15**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Twenty-two per cent of all savers are saving more than £4,000 per year.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

Figure 2.3 shows that instead of there being a direct link between earnings and contribution amounts, many self-employed workers seem to set their contributions based on a particular nominal pound amount (even tens, hundreds or thousands), such as £360, £480, £600, £1,200 or £2,400 per year.

These amounts can tell us about how people think about pension saving. Many of these annual figures are divisible by 12, suggesting monthly contributions of £30, £40, £50, £100 or £200 for the examples above. It therefore appears that many people save into their pension monthly, each month saving the same nominal pound amount, and others save the same (potentially one-off) round amount annually (such as £500, £1,000 or £1,500 per year). We will call the pension savers saving these kind of amounts ‘round savers’.<sup>7</sup>

<sup>7</sup> We see a similar pattern among both men and women, as shown in Figure A3.4.

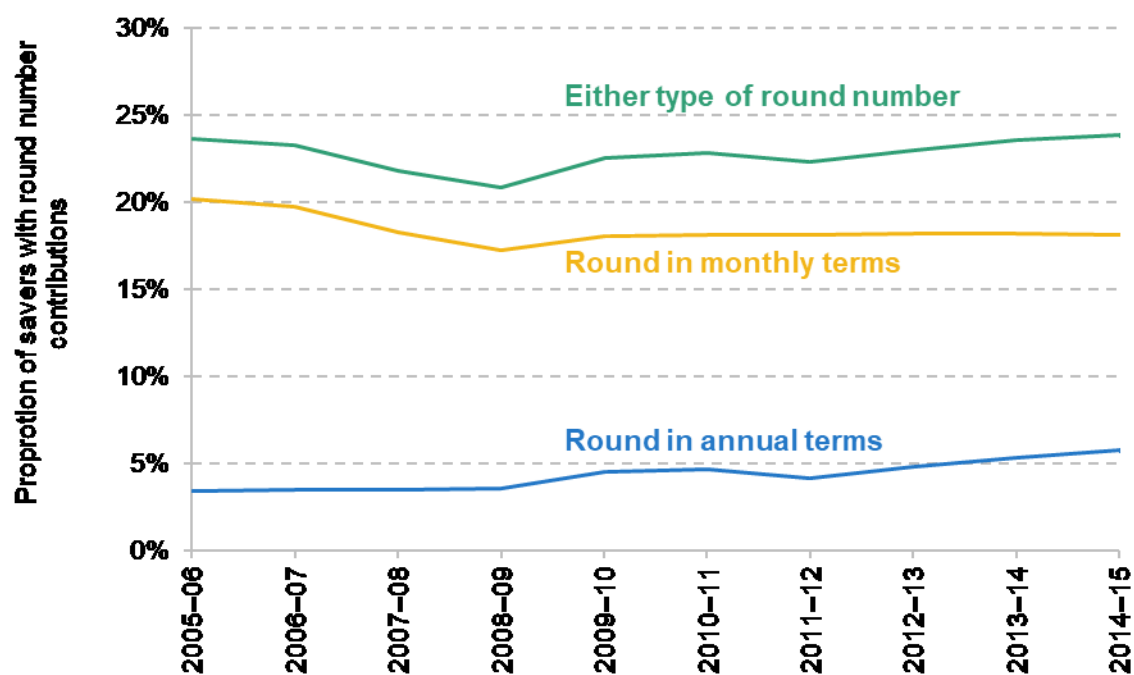
In fact, we find that nearly a quarter of the self-employed who save into a pension seem to be saving a specific round amount per month or per year; 19% save a round number in monthly terms, 4% save a round number in annual terms<sup>8</sup> (in the pooled data set). This is particularly interesting as we do not see similar peaks when looking at the distribution of contributions expressed as a percentage of income, as shown in Figure A2.1, where instead of clear peaks the distribution appears smooth. This suggests that the link between income and amount saved into a pension is weaker for the self-employed than it is for employees.

The prevalence of round contributions has remained fairly stable over time among the self-employed who are saving into a pension. Figure 2.4 shows that the proportion saving both annual and monthly round numbers is relatively unchanged between 2005–06 and 2014–15. Between 2005–06 and 2008–09 the proportion saving round numbers in monthly terms fell, reaching 17% in 2008–09, but it has been increasing or stable since then, and there has also been a small increase in the proportion of people saving in ‘annual’ round numbers since 2008–09, from 3% to 6%.<sup>9</sup> Overall, in 2014–15, 24% of self-employed people participating in a pension scheme saved a round amount in monthly or annual terms.

<sup>8</sup> Round numbers are defined as £10, £20, £25, £30, £40, £50, £60, £70, £75, £80, £90, then multiples of £100 up to £1,000, then multiples of £1,000 up to £50,000. Amounts that are round in both monthly and annual terms (such as £6,000, which is also £500 per month) we consider as round in monthly terms.

<sup>9</sup> The patterns are very similar among both men and women, as shown in Figure A3.5.

Figure 2.4. Proportion of self-employed pension savers saving a round amount in nominal terms into a pension over time

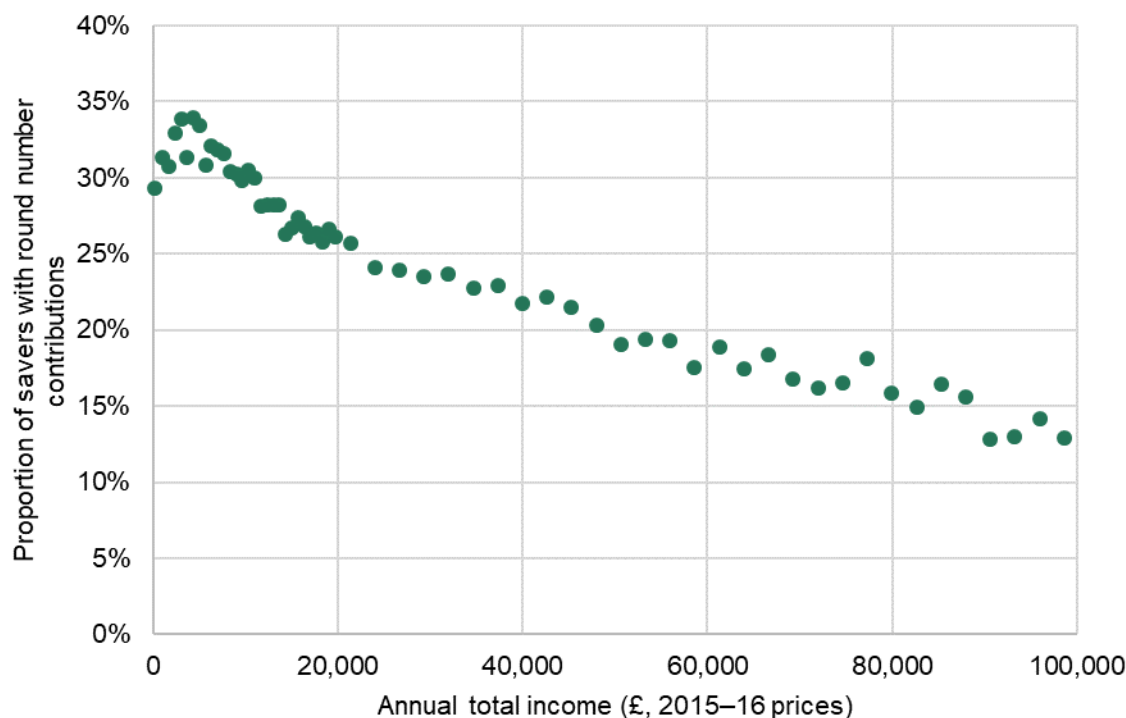


Note: Annual round numbers are defined as £10, £20, £25, £30, £40, £50, £60, £70, £75, £80, £90, then multiples of £100 up to £1,000, then multiples of £1,000 up to £50,000. The monthly round number definition is based on the same numbers but where annual contribution amounts are divided by 12. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

Figure 2.5 shows that there is a clear negative correlation between income level and making round contributions in nominal terms. More than a third of those with the lowest incomes who are saving into a pension are saving round amounts, compared with 13% of those with incomes around £100,000.

**Figure 2.5. Proportion of self-employed pension savers saving a round amount in nominal terms into a pension, by income**



Note: Annual round numbers are defined as £10, £20, £25, £30, £40, £50, £60, £70, £75, £80, £90, then multiples of £100 up to £1,000, then multiples of £1,000 up to £50,000. The monthly round number definition is based on the same numbers but where annual contribution amounts are divided by 12. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Total income includes income from all sources, in 2015–16 prices.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

The clear negative correlation between income and making round contributions may suggest that making round contributions is associated with having fewer resources, having less time to devote to thinking about pension saving, and/or potentially lower financial literacy. We can assess this further by comparing characteristics of round savers and those who save in other ways. We find that round savers are on average slightly older (38% are over the age of 55, compared to 34% of other savers) and are more likely to be working in agriculture, mining and utilities (18%, compared to 11% among other savers), less likely to be working in financial services (8%, compared to 12% among other savers), and less likely to be working in the medical industry (1%, compared to 10% among other savers).<sup>10</sup> From the Labour Force Survey we can see that 27% of workers in the agricultural industry have a degree, compared with 57%

<sup>10</sup> Conditional on income, we do not see much difference in the prevalence of round contributions between men and women (shown in Figure A3.6).

of those working in the financial and insurance sectors.<sup>11</sup> Assuming that having a degree is associated with better numerical and financial ability, this evidence suggests that lower levels of those skills may indeed be linked to making round contributions.

### Summary

In this section we have seen that while some of the differences in average pension participation rates between the self-employed and employees are due to differences in their income levels, pension participation is lower among the self-employed than among employees across nearly the whole earnings distribution.

Among those of the self-employed who are saving into a pension, mean contribution rates are similar for employees and the self-employed earning below £20,000 and above £60,000 per year, but contribution rates are higher for employees in the middle of the earnings distribution. Overall, we find that the middle-income self-employed are much less likely to be saving into a pension, and even conditional on saving into a pension are saving on average a smaller proportion of their earnings.

Some of the difference in the amounts saved by the self-employed and employees may be due to the way in which many of the self-employed choose the amounts they save. Nearly a quarter of the self-employed who save into a pension seem to choose the amount as a monthly or annual round number in nominal pound terms. Those who save in this way have on average lower incomes, are older, are more likely to be working in agriculture and less likely to be working in financial or medical fields. This suggests that round saving may be associated with having lower levels of resources and financial sophistication.

<sup>11</sup> Authors' calculations using the Labour Force Survey 2022 Q3 data.

### 3. How does pension saving of the self-employed change as people age?

In this section we analyse how pension saving of the self-employed changes as they age. Specifically, we compare age profiles of pension participation and contribution rates of the self-employed with those of private sector employees. We also analyse how often the self-employed change into and out of pension saving, or change the amounts they are saving.

#### Key findings

- 1 **Private pension participation among the self-employed increases with age.** Even after controlling for income and other individual characteristics, participation rises by 15 percentage points between the ages of 30 and 59. This is different from employees, whose pension participation rates remain stable across the same ages. The age profile of contributions is also more steeply increasing for the self-employed compared to employees saving into a pension.
- 2 **Self-employed people tend to have more volatile incomes than employees,** and it has been argued that this can lead to a pattern where the self-employed switch into and out of pension saving based on whether they are having a good or a bad income year. We find that having more volatile income is associated with an increased likelihood of both leaving and entering pension saving. However, **the vast majority – 87% of the self-employed – do not change their pension participation status over a five year period.**
- 3 Self-employed workers are also much more likely to leave rather than enter pension saving. **We find that out of those who were not saving in a given year, only 6% are saving nine 9 years later, while out of those who were saving in the initial year, 37% have stopped saving nine 9 years later.**
- 4 **Many of the self-employed who save into a pension rarely change the nominal contribution amounts they make – nearly half (49%) of those**

saving in two consecutive years save the same cash amount in both years.

**Among those who are still saving into a pension 9 years later, close to a quarter (23%) are still saving the same cash amount.** Saving exactly the same amount year after year is more common among those with lower incomes.

- 5 **Among those who continue saving into a pension over time, those who were initially saving a round amount in nominal terms are even more likely to be saving the same amount several years later – 60% of these people are still saving the same amount 9 years later, compared with 13% among those who were not initially saving a round amount.** The relationship between making initial round contributions and not changing contribution amounts holds even after controlling for income and other characteristics.

## 3.1 Age profiles of private pension saving

Section 2 focused on analysing how pension participation and contributions vary with income. In this section we analyse how pension saving of the self-employed changes with age, and how that compares to employees.

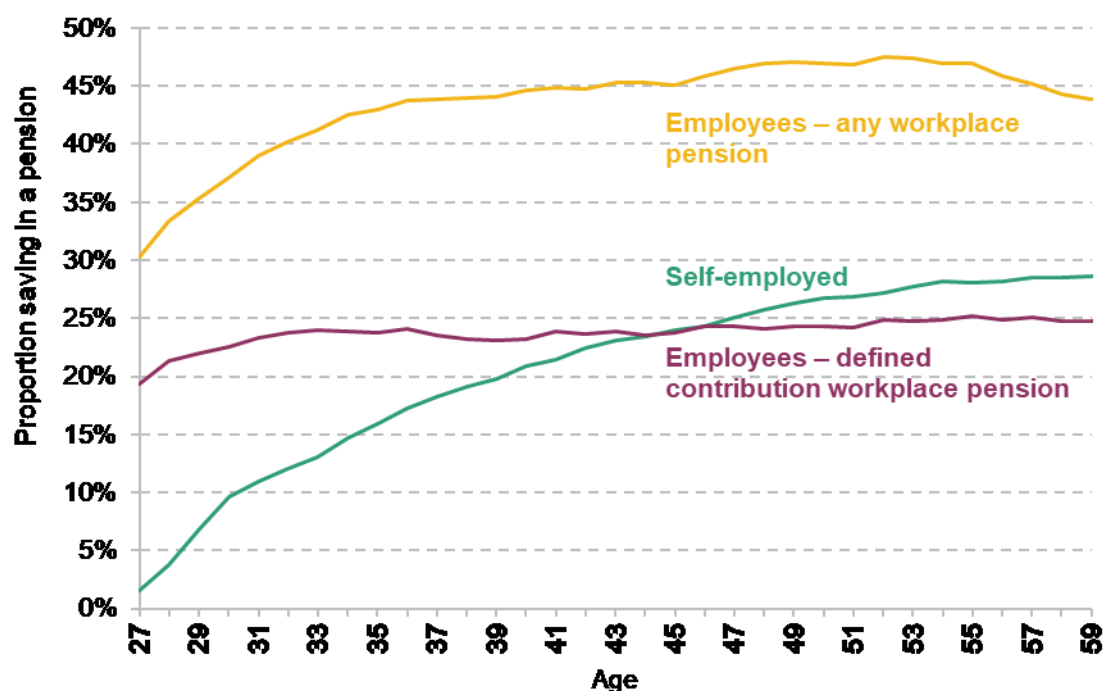
Figure 3.1 shows the age profile of pension participation for the self-employed, as well as for private sector employees. For employees we have two lines, one for saving in a defined contribution scheme, and one for saving in any kind of workplace pension (including defined benefit schemes). Each of these age profiles are drawn by constructing the average predicted pension participation rate for each age, using the estimation results from a linear regression of pension participation on age, year of birth (due to potential differences between generations; measured in 5-year year-of-birth bands) and year of observation. The data used for the self-employed covers our sample period from 2005–06 to 2014–15. For employees we use the sample period from before automatic enrolment, 2005–06 to 2011–12. Cribb and Emmerson (2020) show that the age profiles of pension participation are less steep after automatic enrolment, as the policy particularly boosted the participation of younger employees.

Figure 3.1 shows that for the self-employed, the rate of pension participation increases steeply with age, from around 5% for those in their late 20s to over 30% for those in their late 50s. This is different from private sector employees, especially those saving in a defined contribution pension, for whom pension participation rates remain relatively flat from their early 30s onwards. When taking into account any workplace pension, including defined benefit pension



schemes, pension participation for private sector employees increases from about 30% at age 27 to 47% for those in their mid-50s, before declining to 44% by age 59.

**Figure 3.1. Pension participation by age: predicted probabilities from a regression of pension participation on age, controlling for year and birth cohort**



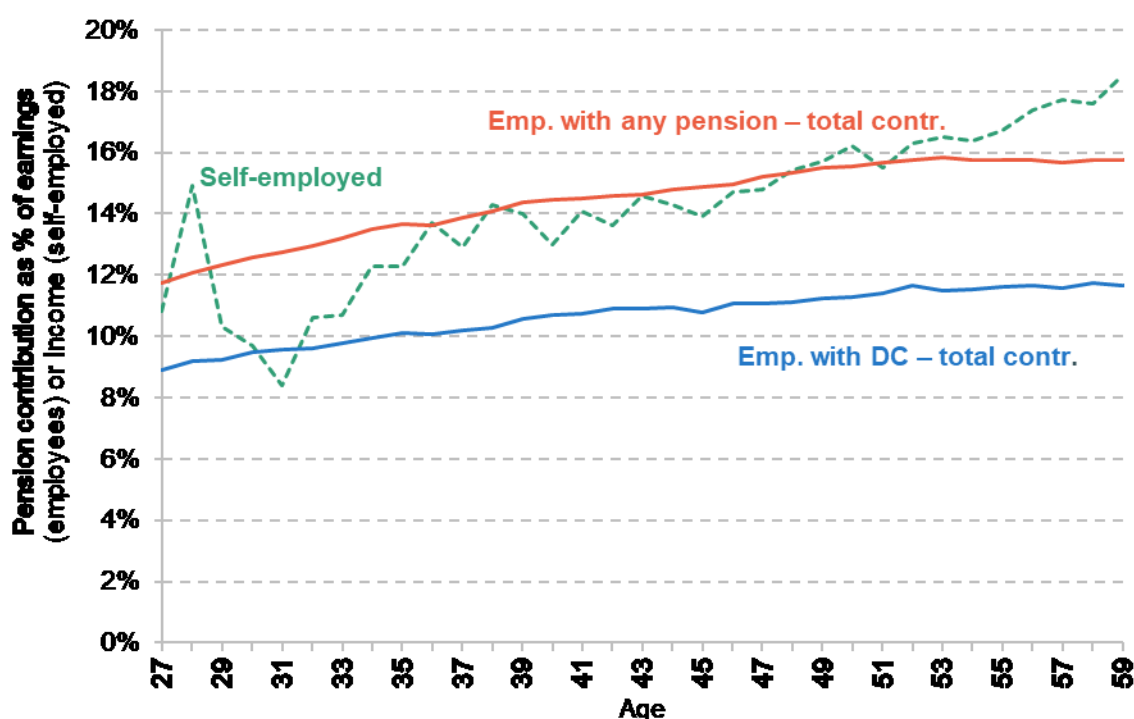
Note: Age profiles are drawn by constructing the average predicted pension participation rate for each age, using the estimation results from an ordinary least squares (OLS) regression of pension participation on age, year of birth and year of observation. Age controls are single age dummies, cohort controls are 5-year birth cohort dummies, and time controls are observation year dummies. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. We suppress results before age 27 due to statistical imprecision as age groups below that age are small.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15 and ASHE data from 2005–06 to 2011–12.

Figure 3.2 shows the age profile of pension contributions among those who are participating in a private pension (as a percentage of earnings). Here we run the same analysis as above, but using the level of pension contributions as the outcome variable and focusing only on people who are saving into a pension. For all three groups – the self-employed, employees with any pension and employees with a defined contribution pension – contributions increase with age. However, the increase is the steepest for the self-employed, for whom average contributions increase from 9% of income for those in their early 30s to 18% of income for those in their late 50s. Among employees the age profiles are flatter – average contributions increase from 13% of earnings in the early 30s to 16% of income in the late 50s among employees with any type of pension.

Section 2 found that contribution rates were lower among middle-earning self-employed workers than employees. Here we see that across almost the full age distribution, the self-employed contribution rates (conditional on saving) are higher than among employees with defined contribution pensions. This is mainly driven by the fact that contributions among the low and high earning self-employed workers drive up the overall mean rate of contributions, and the low and high earners can be found across the age distribution.

**Figure 3.2. Pension contributions by age: predicted contribution rates from a regression of pension contributions on age, controlling for year and birth cohort, among savers only**



Note: Age profiles are drawn by constructing the average predicted contribution rate for each age, using the estimation results from an OLS regression of contribution rate on age, year of birth and year of observation, conditional on making positive contributions. Contribution rates are winsorised at the 99th percentile. Age controls are single age dummies, cohort controls are 5-year birth cohort dummies, and time controls are observation year dummies. The self-employed are defined as working-age (age 25–59) self-employed who have been self-employed for at least 5 years with no employment income. We suppress results before age 27 due to statistical imprecision as age groups below that age are small. Employee contributions are the sum of both employee and employer contributions. DC = defined contributions.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15 and ASHE data from 2005–06 to 2011–12.

So far we have established that pension participation, as well as level of contributions, are substantially related to both age and earnings. We also know that earnings tend to increase with age. In order to assess to what extent the upward-sloping age profile of pension participation in Figure 3.1 is driven by earnings rather than an effect of age on its own, we repeat the analysis

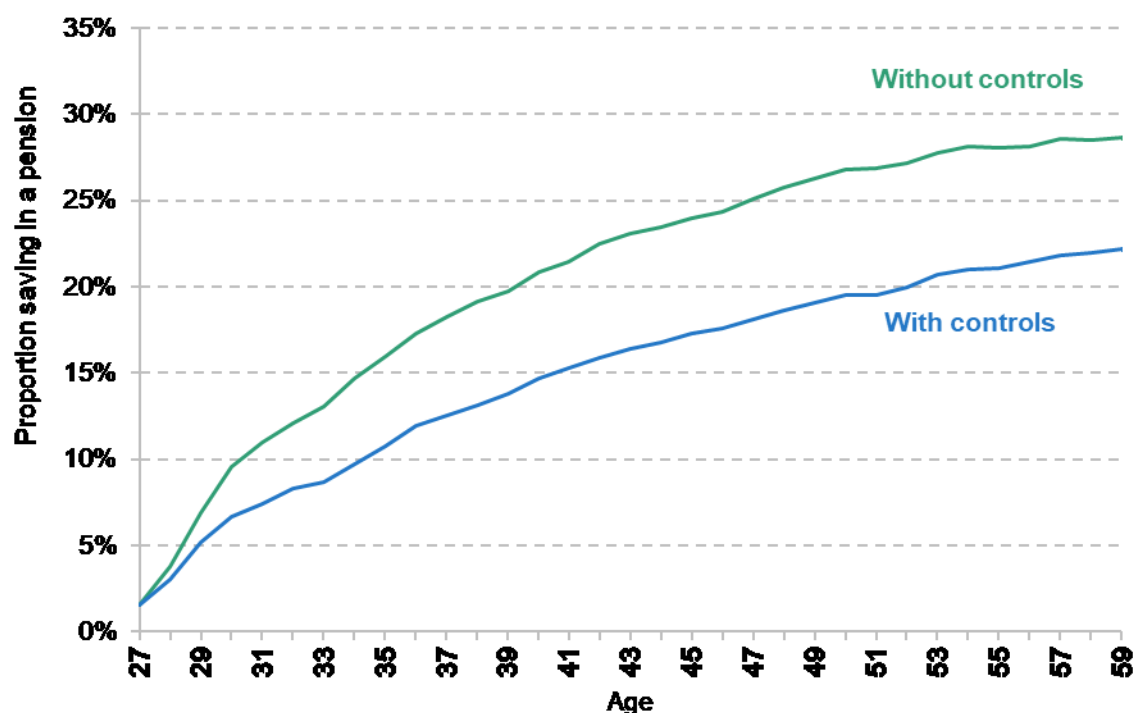
above but with additional controls for income, as well as other characteristics, in the regression.<sup>12</sup>

The regression results in Table A2.1 in Appendix 2 show that pension participation is positively associated with having higher average self-employment income and higher income from other sources, even after controlling for a number of other characteristics. Volatility of self-employment earnings is sometimes offered as a potential explanation of the low level of pension saving among the self-employed. Indeed, the regression results show that pension participation is positively associated with a ‘good earnings year’, which we define as self-employment earnings in the current year being higher than the previous 5-year average earnings (although the magnitude of this effect is small with income of £1,000 higher than average being associated with only a 0.4 percentage points increase in pension participation). We also find that pension participation is negatively associated with more volatile self-employment earnings, which we define as having a larger coefficient of variation of self-employment earnings (again calculated over the last 5 years), although the magnitude of this effect is also small. In terms of other characteristics, pension participation is positively associated with being male, being a partner (rather than sole trader), being born in the UK, and having spent at least 9 years in self-employment.

Figure 3.3 shows the age profile of pension participation after controlling for the additional characteristics. It still shows a clearly increasing age profile of pension participation, although the profile is less steep than the age profile without controls. However, it is clear that pension participation increases with age even beyond the effect of higher incomes and other differences in characteristics at older ages.

<sup>12</sup> The full list of controls includes age, female dummy, partner dummy, immigrant dummy, dummy for being self-employed for at least 9 years, industry dummies, government region dummies, dummy for having property income, dummy for having pension or (taxable) benefit income, self-employment income, income from other sources, and income volatility measures (coefficient of variation of income over the last 5 years, average income from self-employment over the last 5 years, deviation from average self-employment income in the current year).

Figure 3.3. Pension participation by age among self-employed people: age coefficients from a regression of pension participation on age and a full list of covariates



Note: Age profiles are drawn by constructing the average predicted pension participation rate for each age, using the estimation results from Figure 3.1 and an OLS regression of pension participation on age, year of birth, year of observation, and the controls described in footnote 9. Age controls are single age dummies, cohort controls are 5-year birth cohort dummies, and time controls are observation year dummies. The 'with controls' line is drawn by adding average year and cohort effects (as well as the constant) to age coefficients from the regression. We then adjust the age profile to start from the same point as the 'without controls' line in order to facilitate comparison. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. We suppress results before age 27 due to statistical imprecision as age groups below that age are small.

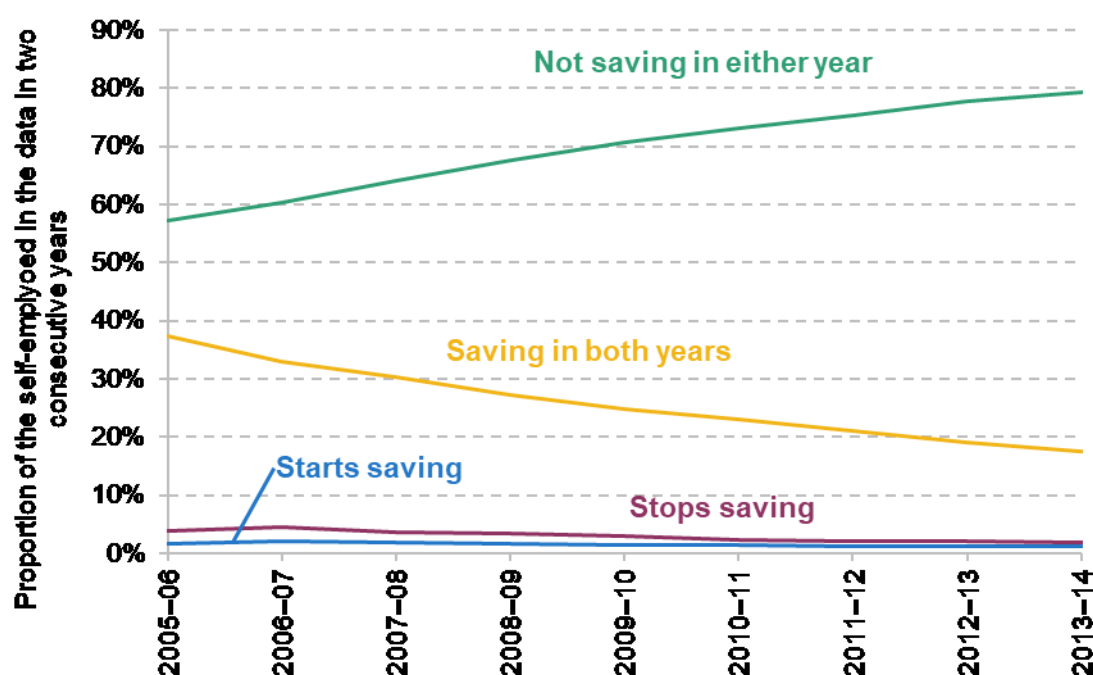
Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15 and ASHE data from 2005–06 to 2011–12.

## 3.2 Moves into and out of pension schemes between years

So far we have examined the cross-sectional age and income profiles of pension participation and saving rates, accounting for calendar year and cohort effects. For the rest of this section we use the panel data aspect of our data set to focus on changes over time in individuals' pension participation status and the amounts saved. We will also examine the extent to which individual characteristics, including the level and volatility of income, are associated with changes in pension saving.

We start by looking at how often people move into and out of pension saving between tax years and how the prevalence of these changes has evolved over time. We first focus on people whom we observe in the data in two consecutive years, and split them by whether they are saving in both periods, not saving in either period, or start or stop saving between the two periods. Figure 3.4 shows that in 2005–06, the majority of the self-employed (57%) are not saving in either year, 37% are saving in both years, 4% have stopped saving (were saving in the previous tax year but are no longer saving this tax year) and 2% have started saving since the previous tax year. The ordering of these four categories stays the same over time, but the proportion of people not saving in either year increases dramatically, and at the end of the period 79% of the sample were not saving in either period. At the same time, the proportion of people saving in both years decreased to 18%. There are also fewer people both starting and stopping saving (2% and 2%, respectively).

**Figure 3.4. Flows between starting and stopping pension saving between two consecutive years, over time**



Note: The four groups are mutually exclusive based on whether the individuals were saving or not saving in a private pension in the current year and the following year. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

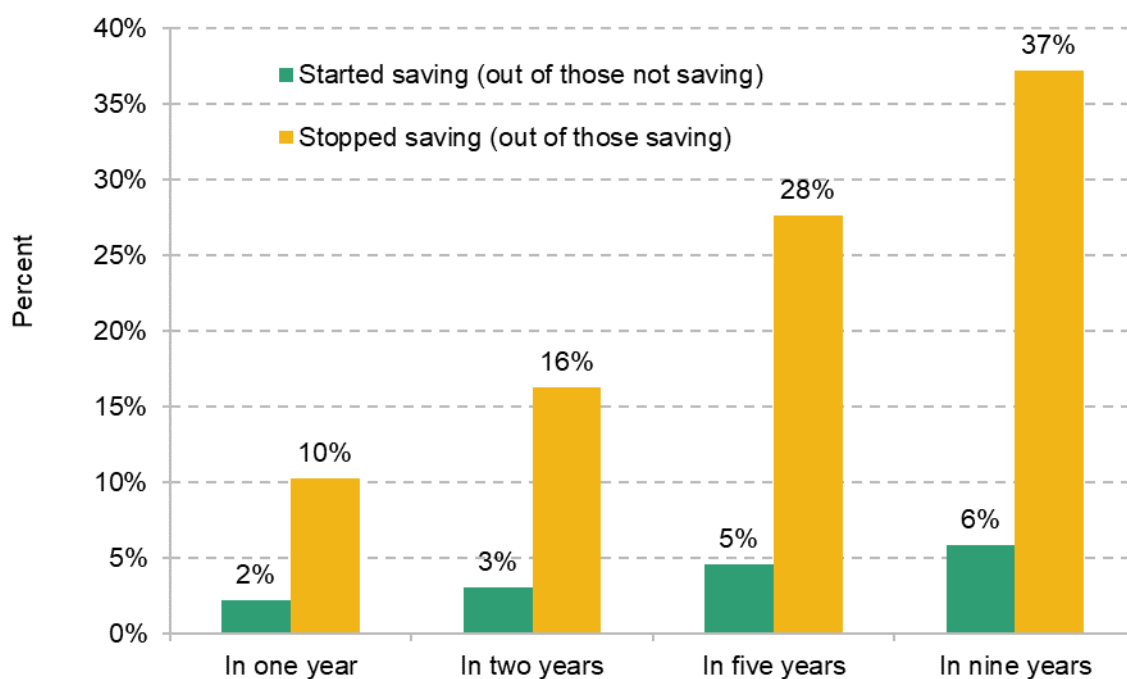
Source: Authors' calculations using HMRC Self Assessment data 2005–06 to 2014–15.

Figure 3.4 refers to year-to-year transitions. However, with the tax data we can also follow people over a much longer period, and can examine whether people start or stop saving into a

pension after a longer period of being self-employed.<sup>13</sup> We find that of those who were not saving in a given year, only 6% are saving 9 years later, while of those who were saving in the initial year, 37% have stopped saving 9 years later. Figure 3.5 shows that the self-employed are much more likely to stop than start saving into a pension. Very few (about one in 17) of those who were not saving into a pension in the first year of the data will start saving into one by the final year of our sample period.

These findings are consistent with the fall in pension participation shown in Figure 1.1, and with Karjalainen's (2023) findings that this was not primarily due to the changing composition of the self-employed workforce. It implies that people who were once saving into a pension are increasingly leaving them, and there are only very small fractions of those who were not saving in a pension who have started saving in a private pension scheme.

**Figure 3.5. Proportion of people stopping and starting saving into a pension**



Note: 'Started saving' is calculated as a percentage of those who were not saving initially, 'stopped saving' is calculated as a percentage of those who were saving initially. We pool data across all years. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data 2005–06 to 2014–15.

<sup>13</sup> It is worth noting that our sample is those who have been self-employed for at least 5 years, so not saving in the initial year is equivalent to not saving in at least the fifth year of being self-employed with no employee income.

In order to investigate the drivers behind changes in pension participation status, we run regressions of indicator variables of starting and stopping saving between two consecutive periods, on a number of individual characteristics. The results (Tables A2.2 and A2.3 in Appendix 2) show that women are less likely to start saving, and more likely to stop saving. This is consistent with the finding in Section 3.1 that women are less likely to participate in a pension scheme (even after controlling for a range of characteristics).

The results also show that starting saving is more likely among those with higher average earnings, and those having a ‘good year’ (earnings in current tax year higher than the 5-year average), whereas these two income measures are negatively associated with stopping saving. This is also consistent with the results in Section 3.1. However, as with the results in that section, while the coefficients are statistically significant, the magnitude of these effects is very small.

We found in Section 3.1 that volatility of self-employment earnings is negatively associated with pension participation. From the regression results in Tables A2.2 and A2.3 in Appendix 2 we can see that the coefficient of variation of self-employment earnings, a measure of earnings volatility, is positively associated with both starting and stopping saving. Among the self-employed, those with more volatile incomes are more likely to move between participating and not participating in a pension scheme over time than self-employed people with more stable incomes, although the magnitude of these effects is again economically small.

While these effects are statistically significant, very few people switch between saving and not saving into a pension. Table 3.1 shows the proportion of people who start and stop saving into a pension over a 5-year period. It is clear that moving into and out of pension saving is rare – 87% of the self-employed people we observe over a 5-year period never stop or start saving. The majority of the remaining 13% only stop or start saving once, and only 0.1% of all self-employed people move back and forth between saving every year.<sup>14</sup> In other words, do not find evidence for a pattern of a significant number of self-employed workers switching into and out of pension saving each year.

<sup>14</sup> It is worth noting that we only observe changes between tax years – we cannot observe people moving into and out saving, for example, between months.

Table 3.1. Proportion starting and stopping pension saving over a 5-year period

Number of times stopped	Number of times started		
	0	1	2
0	86.9%	2.5%	N/A
1	7.1%	2.9%	0.2%
2	N/A	0.4%	0.1%

Note: Two cells are not applicable because it is not possible to stop (start) saving twice without ever starting (stopping) saving. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data 2005–06 to 2014–15.

### 3.3 Changes in pension contributions over time

In this section we analyse how the self-employed change their pension contribution amounts over time. We focus on the subset of the self-employed who remain as participants in a private pension scheme over time in order to abstract from contributions changing simply as people move into or out of a pension scheme.

As seen in Section 2.2, many of the self-employed seem to choose a round nominal amount for their contributions. Thus, we present changes in pension contributions also in nominal terms (without adjusting for inflation).<sup>15</sup> Figure 3.6 illustrates how the nominal contributions made by the self-employed (who are saving into a pension) change between two tax years (1, 2, 5 and 9 years apart). Remarkably, nearly half (49%) of the pension savers are saving the same nominal amount a year later, with a further 17% changing their annual contributions by less than £100 (12% increasing and 5% decreasing). More strikingly, 9 years later 23% of savers are still saving the same amount in cash terms and a further 15% had changed their nominal saving amount by less than £100. Over the 9-year period we look at (2005–06 to 2014–15), someone who has

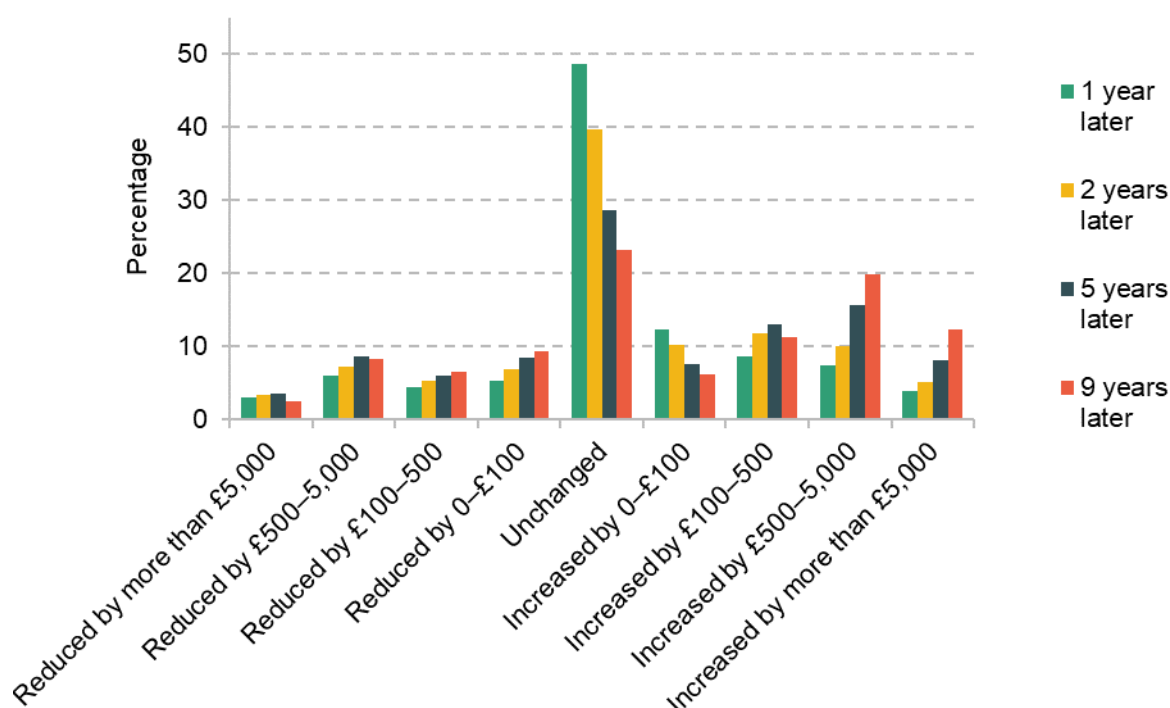
<sup>15</sup> As prices have increased over this period, stable nominal contribution amounts imply a real-terms decrease in pension contributions.



unchanged cash-terms contributions was making contributions which in real (inflation-adjusted) terms were 20% lower in 2014–15 than in 2005–06. In times of high inflation, such as 2022, the value of contributions fixed in cash terms falls much more significantly over time.

We term people who maintain their contributions at the same nominal amounts across years ‘sticky savers’. The fractions of self-employed participants in pension schemes who are sticky savers are high among both men and women, though men are slightly more likely keep their nominal contributions unchanged over time (as shown in Figure A3.7 in Appendix 3).

**Figure 3.6. Changes in contributions among those saving across two periods**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

This pattern of saving the same nominal amount into a pension over time is potentially a cause of concern. Given that incomes tend to rise in cash terms over time, there is a risk that the self-employed who do not change their nominal pension contributions over time end up saving too little for retirement, or – more generally – do not respond to changes in their life that would ideally lead to changes in saving for retirement. Employees tend to choose pension contributions as a percentage of pensionable pay, or, at least for those contributing minimum amounts under automatic enrolment, as a percentage of ‘qualifying earnings’ (between the lower and upper earnings limits). This means that as employees’ earnings increase (or decrease), the amount they save into a pension tends to increase (or decrease) accordingly even if they do not make any

active changes to their pension saving arrangements. This is not true for any self-employed individuals who choose saving amounts as a nominal pound amount which is seemingly unlinked to earnings.

This is an even bigger problem if the amounts that the self-employed choose to save into their pension are too low to start with. The most common (modal) amount that self-employed people in our data save into their pension is £600 per year, or £50 per month. This is similar to what an employee with earnings of £14,000 would save into their pension under the automatic enrolment minimum default rate (including the contribution from the employer).<sup>16</sup> This means that a self-employed saver with income above £14,000 who contributes £50 per month into their pension is saving less than an employee with equivalent income would be saving by default. However, as illustrated in Figure 2.2, the average (mean) contributions among self-employed workers who are saving into a pension were in fact higher than the minimum contribution rates under automatic enrolment across the whole income distribution.

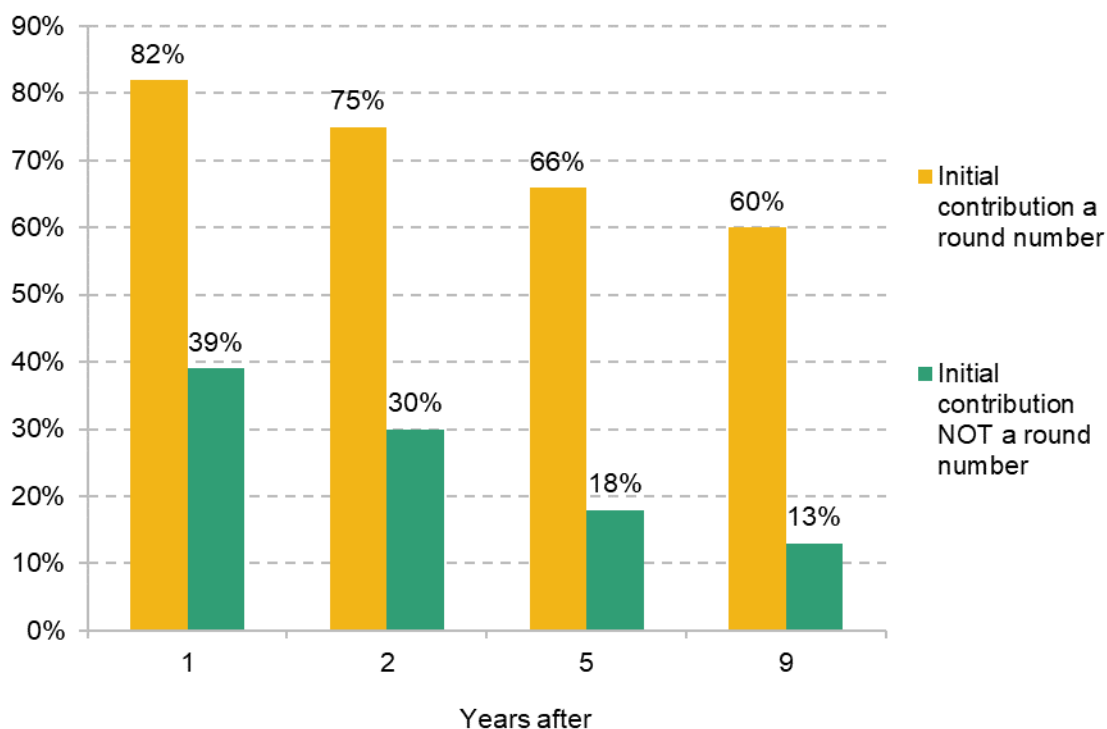
When looking at the characteristics of the ‘sticky savers’, we find that, in a similar way to the patterns of people saving round number amounts, ‘sticky saving’ is more likely among those with lower earnings, those who are older, and those working in agriculture, and it is less likely among the self-employed in the medical and financial fields. The relationship between different characteristics and saving the same nominal amounts over time is shown in Table A2.5 in Appendix 2.

Given that round and sticky savers are similar in terms of their characteristics, we can also look at whether the two behaviours are correlated. Figure 3.7 compares the likelihood of saving the same nominal amounts over time, based on whether the amount saved in the first year was a round number. The figure shows that among pension savers, those who are round savers to begin with are much more likely to be sticky savers. In other words, of those who were saving a round amount in the initial year, 60% are saving the same amount 9 years later, compared with 13% of those who were making non-round contributions at the start. This suggests that many self-employed people choose their pension contribution amounts based on a monthly or annual round figure, and they often make no further changes to the amount they are saving over the years. Sticky saving behaviour is associated with saving round nominal amounts even after controlling for income and other characteristics, as shown in the regression results in Table A2.4 in Appendix 2.<sup>17</sup>

<sup>16</sup> Total contributions of 8% of pensionable pay.

<sup>17</sup> Figure A3.8 suggests that men are more likely to be ‘sticky’ savers than women. Results in Table A2.4 show that for contributions between 1 and 2 years apart, this gender difference in the likelihood of not changing nominal contributions remains even after controlling for other individual characteristics and round initial contributions.

**Figure 3.7. Proportion saving the same nominal amount after different periods of time, based on whether their initial contribution was a round number in monthly or annual terms**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

## Summary

In this section we have analysed how pension participation and contribution rates of the self-employed change with age, and found that both increase with age. The upward-sloping age profile of pension participation holds even after controlling for income and other characteristics. We also document trends in how often the self-employed move into and out of pension saving, and find that moving into and out of saving is rare, but consistently not saving into a pension is becoming increasingly common, while consistently saving in one is becoming much less common. This is consistent with the trend of declining pension participation over time.

We also find that among those saving into a pension, a significant minority keep on saving the same cash-terms amount across years. In particular, of those saving in two consecutive years, nearly half are saving the same amount in nominal terms in the following year, and of those saving 9 years apart, nearly a quarter are saving the same nominal amount in both years. This is even more common among those who were saving a round monthly or annual figure in the first period, and is more common among those with lower earnings.

## 4. Do tax incentives affect pension saving of the self-employed?

As pension contributions are exempt from upfront income tax, the incentive to save in a pension differs based on whether the individual is a basic-rate or a higher-rate taxpayer (or indeed, an additional tax rate payer). In this chapter we therefore examine how pension saving among the self-employed responds to tax incentives.

### Key findings

- 1 **The upfront tax incentive for pension saving changes at the higher-rate tax threshold, as those who are paying the higher marginal rate of tax (40%) receive a larger pension tax relief than those paying basic-rate tax (20%).** We study whether the pension saving behaviour of the self-employed responds to the change in the price of pension saving at the higher-rate tax threshold.
- 2 **We find that the change in the incentive to save in a pension at the higher-rate threshold increases pension participation among the self-employed around that point by 3 percentage points, from a base-level participation rate of about 40%.** We also find an average increase in saving of £100 per year among those saving in a private pension, from an average contribution level of £2,000 per year around the higher-rate tax threshold.
- 3 These effects are quite sizeable, in particular in comparison to employees whose pension saving responds only very modestly to tax incentives. However, **the magnitude of these effects suggests that the upfront income tax incentive alone does not induce a very large increase in pension saving among the self-employed.**

## 4.1 Pension tax relief system

Pension saving is a tax-favourable way to save for retirement compared to most other forms of saving. This is because pension contributions are exempt from income tax, and although private pensions are taxed upon receipt, people can withdraw 25% of their accumulated pension free of income tax after the age of 55, although there are limits (most notably the ‘lifetime allowance’ and ‘annual allowance’) on how much can be built up in a pension while still enjoying the tax relief.<sup>18</sup>

Understanding how people’s pension saving responds to tax incentives is particularly important to understand given the desire from policymakers to encourage pension saving among the self-employed. The evidence of how self-employed workers’ pension saving responds to existing tax incentives can shed light on the extent to which additional tax incentives could be used to boost pension saving.

## 4.2 Effect of tax incentives on pension participation and saving rates

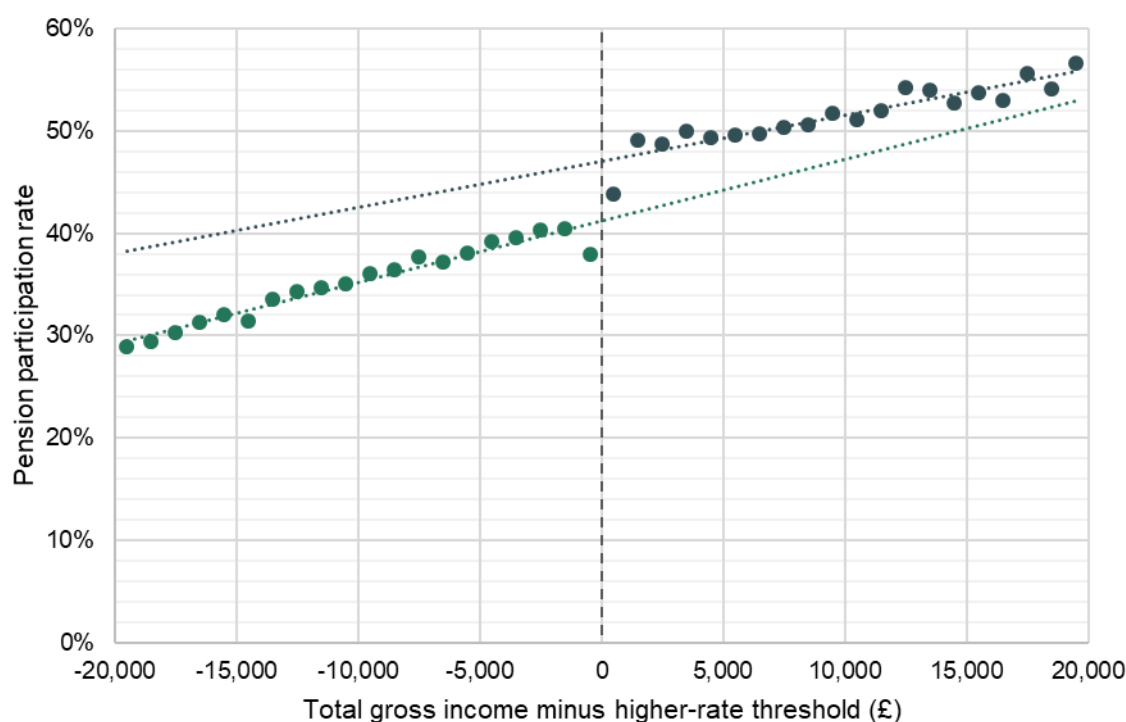
In order to study the effect of tax incentives on pension participation, we take advantage of the fact that as people’s earnings move above a certain level, the price of pension saving changes. This is due to the fact that for income above the higher-rate threshold (HRT, £50,270 in 2022–23), the marginal income tax rate is higher (40%, compared to 20% below the threshold), and the upfront ‘tax price’ of starting to save into a pension is lower. In other words, if an individual earns more than the HRT, the first pound they save in a pension reduces their taxable income by £1, and thus reduces their income tax bill by 40p, and the upfront cost of saving the first pound is 60p. For an individual earning less than the HRT, £1 saved reduces their income tax bill by 20p, meaning that the upfront cost of saving the first pound into a pension is 80p.

Because the upfront cost of saving in a private pension is lower for those above HRT, the incentive to contribute to a pension increases discontinuously at the HRT. In order to assess whether self-employed individuals earning above the HRT actually respond to that tax incentive, we can first look at pension participation rates around the HRT, as shown in Figure 4.1. The horizontal axis shows the distance from the HRT, and the vertical axis shows what proportion of the self-employed with that level of income are saving into a pension.

<sup>18</sup> More information on taxation of private pensions can be found in: <https://ifs.org.uk/taxlab/taxlab-taxes-explained/taxation-private-pensions-explained>.

Figure 4.1 shows that there is a discontinuity in pension participation rates around the HRT – the pension participation rate among those earning on average £1,500 less than the HRT is 40%, whereas it is 50% for those with earnings on average £1,500 above the threshold. Thus, graphically we see evidence for the self-employed workforce responding to the tax incentive, as those above the HRT are materially more likely to be saving into a pension. This response (whether to participate in a pension scheme or not) is known as the ‘extensive margin response’.

**Figure 4.1. Pension participation rates around the higher-rate tax threshold**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. The dots show the mean income and pension participation rate within £1,000 bins of nominal income around the higher-rate threshold. The dotted lines are linear trendlines for observations below and above the HRT.

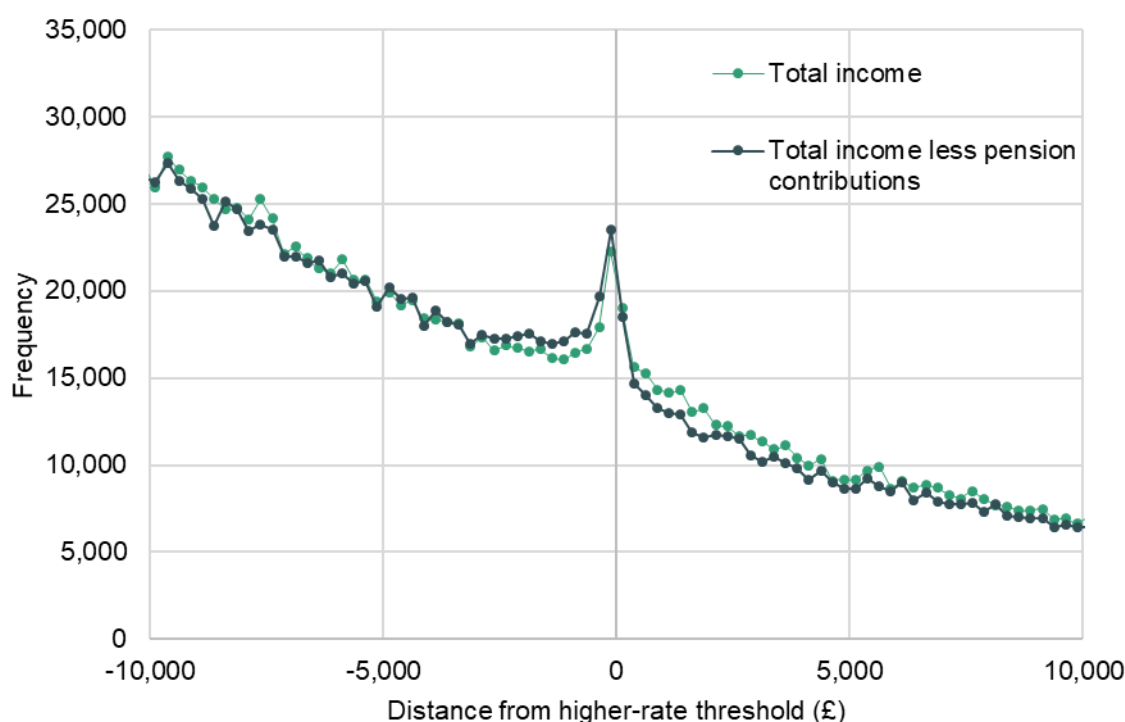
Source: Authors' calculations using HMRC Self Assessment data 2005–06 to 2014–15.

In addition to pension participation rates, we can examine the impact of tax incentives on the amount that people save into a pension around the HRT. We do this by looking at whether we see any evidence of people using pension contributions to adjust their taxable incomes to be close or equal to the HRT. As discussed above, those with incomes above the upfront HRT can make pension contributions at an upfront cost of 60p of income for each pound, until their taxable income equals the HRT, after which the cost of pension saving increases to 80p. Thus, if the self-employed are responding to these tax incentives, we would expect them to be more likely to report taxable income (i.e. after pension contributions are deducted) at or just below the HRT when compared to income measured before pension contributions are deducted.

Figure 4.2 illustrates the number of people reporting incomes around the HRT. The first thing to note is that even before considering pension contributions, there are many people who have incomes just below the HRT. One reason for this is that people who actually have an income just above the HRT have a greater incentive to report a lower income (i.e. one just below the HRT) than do people with lower incomes. Alternatively, it could be because people truly respond to the higher tax rate by working less or for example reporting more capital expenses than they otherwise would have, which could also lead to many people with incomes just below the HRT.

For our purposes, however, the key result is the difference between the distribution before and after deducting pension contributions. When looking at total income after pension contributions, there are more people at, and just below, the HRT, compared to when looking at the distribution of total income before deduction of pension contributions. This suggests that some self-employed people are responding to the tax price of pension saving and using pension contributions as a way to adjust their taxable income to reach the HRT. This response of how much to save into a pension is known as the ‘intensive margin response’ (i.e. it refers to how much people contribute, conditional on participating).

**Figure 4.2. Number of people reporting incomes around the higher-rate tax threshold**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. The dots show the number of people reporting a level of income within £500 bins of nominal income around the higher-rate threshold.

Source: Authors' calculations using HMRC Self Assessment data 2005–06 to 2014–15.

Existing research on employees (O'Brien, 2023) shows that employees' pension saving responds only modestly to upfront income tax relief, both in terms of participation and the amounts they save (i.e. both at the extensive and intensive margin). The difference in responsiveness between employees and the self-employed is perhaps unsurprising. Given that the self-employed fill in their own tax returns, they may be more aware of their taxable incomes and tax incentives than employees. The automatic enrolment default saving options also act as a very strong nudge and signal for employees, which might mean that active changes to pension saving based on tax incentives among employees are even more unlikely.

## 4.3 Price elasticity of pension saving

Section 4.2 showed graphically how pension saving of the self-employed responds to tax incentives. We can study these responses in more detail by using a sample of people that we observe above and below the HRT in different years, which allows us to calculate the price elasticity of pension participation to tax incentives. This is particularly useful as it also allows us to see how responsive the self-employed are to tax incentives compared to employees.

In order to calculate the price elasticity of pension saving to tax incentives, we want to estimate the relationship between pension saving (both the decision to join a pension and the level of contributions), and the relative price of pension saving, as well as income. To do that we estimate the following regressions:

$$D_{it} = \beta \ln p_{it} + \gamma \ln y_{it} + \delta X_{it} + \alpha_i + \alpha_t + v_{it}, \quad (1)$$

$$\ln z_{it} = \epsilon_{\text{INT}} \ln p_{it} + \epsilon_{\text{INT}} \ln y_{it} + \delta X_{it} + \alpha_i + \alpha_t + u_{it}, \quad (2)$$

where  $D_{it}$  is a dummy variable indicating pension participation of individual  $i$  at time  $t$ , and  $z_{it}$  is the level of pension contributions (in pounds per year). While pension participation is observed for everyone, contributions ( $z_{it}$ ) are only measured for those participating in a pension scheme.

In these equations,  $p_{it}$  is relative price of pension saving, and  $y_{it}$  is income. As explained above, the relative cost of a pound of pension saving ( $p_{it}$ ) is 60p for someone above the HRT and 80p for someone below the HRT. We also include individual ( $\alpha_i$ ) and year ( $\alpha_t$ ) fixed effects, and control for age and age squared in the vector of controls  $X_{it}$ .

Because of child benefit, the tax price of pension saving also changes at £50,000 for people with children who earn more than their partner. In particular, if the higher earning parent's income is above £50,000 per year, child benefits (worth £1,134 per year for the eldest child, and £751 for



additional children in 2022–23) are reduced at a rate of 1% for every extra £100 of income above £50,000, and families where the higher earning partner earns more than £60,000 do not receive any child benefit. This loss of a benefit increases the marginal tax rate and thus further reduces the cost of a pound pension saving of affected workers. However, in this analysis we abstract from this change in the tax incentive, as we do not observe whether the self-employed workers have children in the administrative data.

Because pension contributions reduce taxable income, they can change an individual's tax band, and thus the price of a marginal £1 of pension saving depends on how much an individual is contributing. To overcome the issue of endogeneity arising from the fact that pension contributions can also affect the relative price of pension saving, we use an instrumental variables (IV) approach where we instrument the price of a marginal £1 of pension saving with the price of the first £1 the individual contributes.

In these regressions  $\varepsilon_{INT}$  is the intensive margin price elasticity, and we can calculate the extensive margin elasticity by dividing the estimate of  $\beta$  from equation (1) by share of individuals making positive contributions (which is 37% in these data, as shown in Table 4.1). The results from these regressions are presented in Table 4.1.

**Table 4.1. The responsiveness of pension participation and contribution amounts to tax incentives**

	Extensive margin (IV)	Intensive margin (IV)
ln(price)	−0.116*** [−0.008]	−0.203*** [−0.033]
ln(income)	0.032*** [−0.004]	0.123*** [−0.013]
Observations	308,614	114,864
Proportion with positive contributions	0.37	
<b>Price elasticity</b>	<b>−0.31</b>	<b>−0.20</b>

Note: Results of IV regressions (1) and (2), using as an instrument the price of a marginal £1 of pension saving with the price of the first £1 the individual contributes. Estimated using two-stage least squares. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Standard errors are given in square brackets. \*\*\* indicates statistical significance at the 0.1% level.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

The results show a total price elasticity of −0.52 (−0.31 at the extensive margin and −0.20 at the intensive margin). In other words, because at the HRT the upfront tax price of pension saving

falls by 25% (from 80p to 60p), we would expect an 8% increase in proportion saving and a 5% increase in amount saved at that point.<sup>19</sup> To put these figures into context, given that at the HRT about 40% of the self-employed are saving into a pension, our estimates imply an increase of 3 percentage points in the pension participation rate at HRT from the tax incentives.

Similarly, the average saving amount at around the HRT (among those participating) is approximately £2,000, so we would expect the change in tax incentives to cause an increase of £100 per annum in pension saving at this level of earnings. These are larger elasticities than when looking at employees. Using an equivalent methodology using the Annual Survey of Hours and Earnings data on employees' pay and pension contributions, O'Brien (2023) finds that over the period from 2013–14 to 2019–20, employees' extensive margin price elasticity was  $-0.007$  and intensive margin elasticity was  $-0.095$ , implying that the responses to tax incentives for self-employed people are considerably larger than are those for employees, particularly on the extensive margin (the decision over whether or not to participate). Given that employees are automatically enrolled, which harnesses inertia in pension savings decisions, this may not be overwhelmingly surprising.

As discussed in Appendix 1 in more detail, a potential issue with the pensions data in the administrative records is that basic-rate taxpayers with a relief-at-source pension do not necessarily have a tax incentive to report their pension saving in the Self Assessment form. This is because the tax relief is added to their pension by the pension scheme, and thus reporting contributions in the Self Assessment form provides no further tax relief. Those above the HRT may be more likely to report pension saving due to the tax incentive of doing so, as they would otherwise lose the additional 20p per pound of tax relief. Thus a caveat with the analysis in this section is the fact that we currently cannot rule out that changes in reporting behaviour might contribute to the estimated elasticities. Comparison to aggregate data from pension providers in Appendix 1 suggests that the Self Assessment data does capture most pension savers, but it would be beneficial to undertake additional research data from pension providers (rather than self-reported contributions) which does not have this potential problem.

### Summary

In this section we have analysed how the self-employed respond to tax incentives of pension saving. We found that the magnitude of the response is larger for the self-employed than for employees; tax incentives increase pension participation by 3 percentage points and saving by £100 per year (among contributors) at the HRT. While these are statistically significant effects,

<sup>19</sup> A price elasticity of  $-0.31$  times  $-25\%$  gives an 8% extensive margin response, and a price elasticity of  $-0.20$  times  $-25\%$  gives a 5% intensive margin response.

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the results suggest that these kinds of upfront tax incentives alone do not deliver a very large boost in pension saving among the self-employed. In fact, some of this unresponsiveness may be due to the fact that tax returns are submitted after the end of the tax year, at which point it is impossible to adjust pension contributions for the previous year.

## 5. Conclusions

The low rates of private pension saving of the self-employed are of increasing concern to policymakers. We have seen a dramatic decline in private pension participation rates among the self-employed population over recent decades, during a period in which the size of the self-employed population also grew significantly. Existing work (Crawford and Karjalainen, 2020; Karjalainen, 2023) has shown that majority of the decline in the private pension rates of the self-employed cannot be explained by changes in the average characteristics, such as the age and income, of the self-employed workforce alone.

In this report we have sought to understand pension saving of the self-employed in much more detail using administrative tax records. We find that the difference in pension participation rates between employees and the self-employed remains even after controlling for the difference in incomes of the two groups, and the gap in participation rates has further widened since the introduction of automatic enrolment, as employees are now more likely to be saving into a workplace pension right across the income distribution.

In addition to level of income, we have been able to study the effect of volatility of incomes on pension saving of the self-employed. It is sometimes argued that the self-employed may want to flexibly move into and out of pension saving based on whether their business is having a ‘good’ or a ‘bad’ year, but we see little evidence of self-employed workers taking advantage of this type of flexibility: 87% do not change their pension participation over a period of 5 years, with the majority of the remainder either moving once from being a pension saver to not, or vice versa, rather than making multiple changes. However, while the tax data provide accurate measures of taxable income and pension saving, they only allow us to analyse income volatility at an annual level, when in fact the self-employed may face seasonal variation in their incomes. We are not aware of any data that would allow us to analyse within year (for example monthly) changes in income and pension saving behaviour of the self-employed, but this would be an interesting topic of research for the future.

### How do retirement outcomes and the financial situation of the self-employed currently fare compared with employees?

We know from existing evidence on the self-employed that they are a heterogeneous group – a larger proportion of the self-employed have very low incomes compared with employees, but it is also true that a higher fraction of the self-employed have very high incomes. Average total wealth levels among the self-employed of different age groups look largely similar to wealth among employees, but the average composition of wealth is different, with the self-employed

holding more of their wealth in housing and less in pensions (PPI 2017). At the same time, those who are currently retired and who spent a relatively large proportion of their working life in self-employment are more likely to report that they are struggling financially than those who spent less or no time in self-employment (Börsch-Supan et al. 2019). This suggests that while there will be some better off self-employed workers who have sufficient wealth to support their standards of living in retirement, the long-term self-employed who did not save into a workplace pension for much of their working life are at elevated risk of being financially vulnerable in retirement.

The recent changes in the size of the self-employed population – with a large increase through the 1990s and 2000s, and a sharp decline since the onset of the Covid-19 pandemic – also means that the composition of the self-employed population is now different than the composition of current retirees who worked in self-employment during their working lives. However, many of the self-employed who reach state pension age after 2016 will benefit from the fact that the new state pension is more generous for the self-employed than the system in place for those reaching state pension age before 2016.

#### How to encourage saving among the self-employed?

The low levels of pension participation among self-employed workers mean that the key policy challenge for the government at the moment is to encourage self-employed workers to engage with the private pension system and start saving into a pension. This is particularly true for those of the self-employed who are self-employed for larger parts of their working lives, as they will have less opportunity to save in a workplace pension and therefore risk not having adequate resources in retirement otherwise.

The evidence on factors that drive the decision of a self-employed worker to start saving into a pension is still limited. The results in this report looking at drivers of entry into pension saving showed that while having higher and less volatile income is predictive of a self-employed worker being more likely to start to save into a pension, the associations are very small in magnitude. Similarly, Crawford and Karjalainen (2020) found using survey data that while the attitudes of the self-employed towards pension saving differ somewhat from employees (in particular the self-employed having much more positive attitude towards property saving than pension saving), we have not seen changes in those attitudes over time that could explain the declining pattern of pension saving among the self-employed. Qualitative analysis on the reasons for starting to save into a pension among the self-employed could help shed some light on the most important drivers.

One aspect of the saving decisions that the self-employed make that we were not able to study with tax data are the wider household circumstances of the self-employed, especially for couples who may pool financial resources. The decision on whether to save into a pension may be very

different for a self-employed worker whose spouse has a relatively generous public sector pension, compared to a worker whose spouse is also self-employed. Understanding how saving decisions interact with pension saving of the spouse and other assets that the household holds may provide more information on the best policy responses for ensuring adequacy of resources in retirement. However, Crawford and Karjalainen (2020) argue that these household level decisions are unlikely to be driving the decline in pension saving among the self-employed, as a similar decline in participation is observed among singles as among couples. They also found that pension participation rate of the self-employed whose partner was saving in a pension was in fact higher than the participation rate among those whose partner was not saving into one.

Nest Insight has in recent years been running an extensive research programme looking at how self-employed people could be supported in saving for retirement (Almond et al. 2022). The trials on messaging, product design, and technology-based ways to encourage saving all show that these nudges can lead to some increase in engagement, but the effects on participation and saving rates in these trials were small. Nest Insight concludes that while nudges that are integrated to the platforms and services that the self-employed use in their managing of day-to-day finances could be a successful tool in encouraging pension saving, the investment required for innovation and widespread adaptation of these products is unlikely to emerge organically and would take time. Thus they suggest that retirement saving solutions should be connected to the income reporting and tax system and work in an analogous way to the employer payroll infrastructure for automatic enrolment.

Our findings in this report showed that current tax incentives alone are not enough to encourage meaningful changes in pension saving. We found that the self-employed are more responsive to upfront income tax incentives than employees, but the sizeable fall in the relative price of pension saving at the income tax higher-rate threshold increases pension participation among the self-employed by only 3 percentage points, from a base-level participation rate of about 40%. The limited response may be partially due to the fact that the tax returns are generally filled in after the tax year, which means that it will be too late to adjust pension contributions for the previous tax year. This might be particularly important for those with fluctuating incomes. Understanding whether the self-employed would respond more to tax incentives if they had more flexibility in terms of making retrospective contributions to their pension, especially if this could be combined with a messaging prompt at the point at which the self-employed fill in a tax return, could be an interesting question for researchers and policymakers to explore. Overall, the findings from this report, as well as existing research, suggest that in order to increase the pension participation rates of self-employed workers meaningfully, new innovations on how to incorporate pension saving defaults for the self-employed as part of the tax system are needed.

### How about those already saving?

Instead of only focusing on getting the currently self-employed workers to enter pension saving, another possible policy option for increasing pension saving among the self-employed would be to try and harness the success of automatic enrolment for those moving from being employees to self-employment. In particular, the government could consider policies to make it easier for a newly self-employed worker with a previous workplace pension pot to continue saving into that pension at a comparable rate. Similarly, the Department for Work and Pensions (through the Universal Credit) has information on the incomes of many of those moving from unemployment or inactivity to self-employment, and this could be another salient moment for the government to interact with the self-employed and perhaps suggest a default contribution fund and rate.

In this report we saw that more than third of the self-employed who we initially see saving into a pension end up stopping saving over the decade we observe them in. This is another group who could be targeted by policy. For those who contact their pension providers asking them to stop their pension contributions, the provider could, for example, suggest that they instead pause their contributions for a period (say for twelve months). This could help keep people who want to stop saving in periods of lower incomes engaged with the pension saving system, and it would also be analogous to what happens to employees who opt out of their workplace pension who will be re-enrolled every three years and every time they move employer.

Among those of the self-employed who consistently save into a pension, a key finding of this work is that even among those of the self-employed who are participating in a private pension scheme, many are ‘sticky’ savers – a large number of the self-employed saving in a pension save round monthly (or annual) cash amounts which they do not change over time, even as their incomes and other circumstances may change. In particular, among those who continue saving into a pension over time, 60% of those who were initially saving a round number amount in nominal terms were still saving the same amount nine years later. Even inflation at target levels of 2% will have reduced the real value of their annual contributions by almost 20%, with a much bigger erosion in the current period of much elevated inflation. This suggests that a way to increase pension saving among those who are contributing could be a form of auto-escalation. In particular, if self-employed workers opted for direct debits to pension funds that are set to increase in line with inflation, or another pre-agreed rate, each year, this would ensure that saving rates do not fall in real terms even if the saver does not make an active decision to change their contributions. This could be achieved by incorporating an active choice around auto-escalation with an agreed menu of uprating options for those who are opening a new pension saving account or reconsidering their contribution amounts.

### Nudges should only be directed towards those who will benefit from saving

Many of the policy suggestions in this summary have focused on how to get self-employed people to start saving into a pension, and how to ensure that savers adjust their saving rates over

time. It is however also important to keep in mind that pension saving may not be the right financial product for all of the self-employed, as many self-employed workers have very low incomes and may be financially vulnerable. This has been further exaggerated by the Covid-19 pandemic – Blackburn et al. (2022) found that the proportion of the self-employed earning less than £1,000 per month increased from 27% before the pandemic to over 40% in April 2022. Any pension saving policies for the self-employed should make sure to target those of the self-employed who can actually afford to make contributions and are at most risk of seeing a large decline in their living standards at retirement in the absence of private saving. Of particular relevance for the self-employed who are basic-rate (or who are not) income taxpayers is that for them a Lifetime Individual Savings Account might be a more suitable retirement saving product than a pension, not least as some could have the option to withdraw these funds and move them into a private pension at a later date if so desired. More generally, policies for the self-employed need to allow ample flexibility for the self-employed to be able to opt out of saving in periods of lower incomes – as we saw during the pandemic, the incomes of the self-employed population are much less well protected during a crisis than the incomes of employees.



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# Appendix 1: Potential misreporting in tax data

Previous studies (e.g. Advani, 2022) have recorded widespread underreporting and misreporting of incomes in the HMRC Self Assessment data. Systematic underreporting of incomes would affect Figure 2.1 by shifting the self-employed data points to the right, which would further increase the gap between the self-employed and employees. However, the effect of this is likely to be limited as Advani (2022) also finds that most non-compliant taxpayers (among those who have been randomly audited) owe less than £1,000 in tax.

On the other hand, we might also expect some underreporting of pension participation, as most pension schemes available to the self-employed are relief-at-source pensions, meaning that anyone whose earnings are below the HRT will not receive any additional tax relief by reporting pension participation to the HMRC. However, we can compare the Self Assessment data to National Statistics tables which are derived primarily from pension scheme participation details supplied by personal pension providers, which means that they should not suffer from underreporting.<sup>20</sup> According to these tables, 380,000 self-employed people were saving in a private pension in the last year of our data (2014–15),<sup>21</sup> and this would imply a pension saving rate of 9.9% compared to 10.4% in the Self Assessment data (among the whole self-employed population). Thus, somewhat reassuringly, the difference in pension participation rates between the self-reported data and the data from pension providers is in fact very small.

<sup>20</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/260010/personal-pensions.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/260010/personal-pensions.pdf)

<sup>21</sup> <https://webarchive.nationalarchives.gov.uk/ukgwa/20161004051934/https://www.gov.uk/government/statistics/personal-pensions-statistics-introduction>

## Appendix 2: Additional results

### Regression result tables

Table A2.1. Linear probability model of pension participation

Pension participation	Coefficient
Female	−5.5 ***
Non-self-employment income (£000s)	0.1 ***
Partner (as opposed to sole trader)	5.2 ***
Immigrant	−6.5 ***
Self-employed for more than 9 years	10.0 ***
Average self-employment earnings (£000s)	0.5 ***
Current year less average self-employment earnings (£000s)	0.4 ***
Coefficient of variation of self-employment earnings	−3.0 ***
Has property income	3.1 ***
Has taxable pension or benefit income	−9.9 ***
Observations	943,170
R-squared	0.21

Note: Also controlling for age, year, cohort, region and industry dummies. Figures are coefficients (multiplied by 100) from a linear probability model of pension participation on individual characteristics. For example, the interpretation of −5.5 for ‘female’ is that the probability of a female being in a pension was 5.5 percentage points lower than for a male (all else equal). \*\*\* indicates statistical significance at the 0.1% level. Sample is working-age self-employed workers with no income from employment, who have been self-employed for at least 5 years.

Source: Authors’ calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

Table A2.2. Linear probability model of leaving a pension

Leaves a pension	Coefficient
Female	1.4 ***
Partner (as opposed to sole trader)	−1.2 ***
Used agent to complete tax return	−3.5 ***
Has property income	−0.6 **
Capital allowance over £500	−0.5 **
Non-self-employment income (£000s)	0.0 **
Coefficient of variation of self-employment earnings	3.0 ***
Average self-employment earnings (£000s)	−0.1 ***
Current year less average self-employment earnings (£000s)	−0.1 ***
Observations	240,205

Note: Also controlling for age dummies, region dummies and industry dummies. Figures are coefficients (multiplied by 100) from a linear probability model of leaving a pension by the next period on individual characteristics. For example, the interpretation of 1.4 for 'female' is that the probability of a female leaving a pension was 1.4 percentage points higher than for a male (all else equal). \*\* and \*\*\* indicate statistical significance at the 1% and 0.1% level, respectively. Sample is working-age self-employed workers with no income from employment, who have been self-employed for at least 5 years.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

Table A2.3. Linear probability model of entering a pension

Enters a pension	Coefficient
Female	−0.6 ***
Partner (as opposed to sole trader)	−0.0
Used agent to complete tax return	0.2 ***
Has property income	0.4 ***
Capital allowance over £500	0.3 ***
Non-self-employment income (£000s)	0.0
Coefficient of variation of self-employment earnings	0.3 ***
Average self-employment earnings (£000s)	0.1 ***
Current year less average self-employment earnings (£000s)	0.1 ***
Observations	642,292

Note: Also controlling for age dummies, region dummies and industry dummies. Figures are coefficients (multiplied by 100) from a linear probability model of entering a pension by the next period on individual characteristics. For example, the interpretation of −0.6 for 'female' is that the probability of a female entering a pension was 0.6 percentage points lower than for a male (all else equal). \*\*\* indicates statistical significance at the 0.1% level. Sample is working-age self-employed workers with no income from employment, who have been self-employed for at least 5 years.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

**Table A2.4. Linear probability model of a pension saver having the same nominal pension contributions across years**

Characteristic	Has same nominal contributions in:			
	(1) 1 year	(2) 2 years	(3) 5 years	(4) 9 years
Non-self-employment income (£000s)	-0.1***	-0.1**	-0.1*	0.0
Self-employment income (£000s)	-0.2***	-0.2***	-0.1***	-0.1***
Coefficient of variation of self-employment income	-2.6***	-3.0***	-2.7**	-5.3**
Change in self-employment income (£000s)	-0.1***	-0.1***	0.0***	0.0**
Change in non-self-employment income (£000s)	-0.1***	-0.1***	-0.1**	-0.1
Female	-2.7***	-2.2***	-1.2	-0.9
Partner (as opposed to sole trader)	1.5***	1.2**	0.7	0.1
Used agent to complete tax return	7.0***	5.5***	3.6***	4.0**
Has property income	1.1*	1.1	0.6	-1.1
Capital allowance over £500	1.4***	1.3***	1.4*	0.5
Initial contribution a round number in annual terms	26.2***	29.6***	32.7***	33.1***
Initial contribution a round number in monthly terms	38.4***	42.8***	46.7***	46.9***
Observations	214,800	167,120	73,583	10,070

Note: Also controlling for age dummies, region dummies and industry dummies. Figures are coefficients (multiplied by 100) from linear probability models of having the same nominal contributions a number of years later on individual characteristics, using a sample of those who are saving in both periods in question. For example, the interpretation of -0.1 in column 1 for 'female' is that the probability of a female having the same nominal contributions in two consecutive years was 0.1 percentage points lower than for a male (all else equal). \*, \*\* and \*\*\* indicate statistical significance at the 5%, 1% and 0.1% level, respectively. Sample is working-age self-employed workers with no income from employment, who have been self-employed for at least 5 years and who are saving in a pension in both periods in question.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

Table A2.5. Characteristics of savers who are saving round amounts (or not), sticky amounts (or not) and round and sticky amounts (or not)

	Round contr.		Sticky contr.		Round and sticky	
	Yes	No	Yes	No	Yes	No
Average age	51.0	50.2	50.4	49.2	50.4	49.7
Proportion immigrants	4%	5%	3%	6%	3%	5%
Proportion partners	39%	43%	40%	45%	39%	43%
Proportion sole traders	65%	62%	63%	60%	64%	61%
Proportion women	20%	20%	17%	22%	19%	20%
Incomes £0–8k	13%	8%	11%	7%	13%	8%
Incomes £8–14k	17%	12%	16%	10%	18%	12%
Incomes £14–26k	27%	23%	28%	20%	29%	23%
Incomes £26k+	42%	56%	46%	63%	41%	58%
Age 21–34	3%	3%	2%	4%	3%	3%
Age 35–44	19%	22%	20%	25%	20%	23%
Age 45–54	40%	41%	43%	43%	43%	43%
Age 55–64	38%	34%	34%	29%	35%	31%
<b>Industry</b>						
Agriculture, mining, utilities	18%	11%	17%	9%	20%	12%
Manufacturing	5%	5%	5%	4%	5%	5%
Construction	24%	21%	26%	18%	26%	21%
Wholesale <sup>1</sup>	12%	11%	13%	10%	13%	11%
Hotels	3%	3%	3%	2%	3%	3%
Transport excl. taxis	2%	2%	2%	2%	2%	2%
Taxis	2%	2%	2%	2%	2%	2%
Financial and professional services	8%	12%	9%	14%	7%	12%
Business services incl. real estate	9%	9%	8%	9%	8%	9%
Medical	1%	10%	1%	15%	1%	10%
Health, education, social services	3%	3%	3%	4%	3%	3%
Recreational services	4%	3%	3%	4%	3%	3%
Hairdressing	4%	3%	3%	3%	4%	3%
Domestic services	4%	3%	3%	3%	3%	3%
Sample size	71,497	242,925	122,710	122,426	45,618	199,518

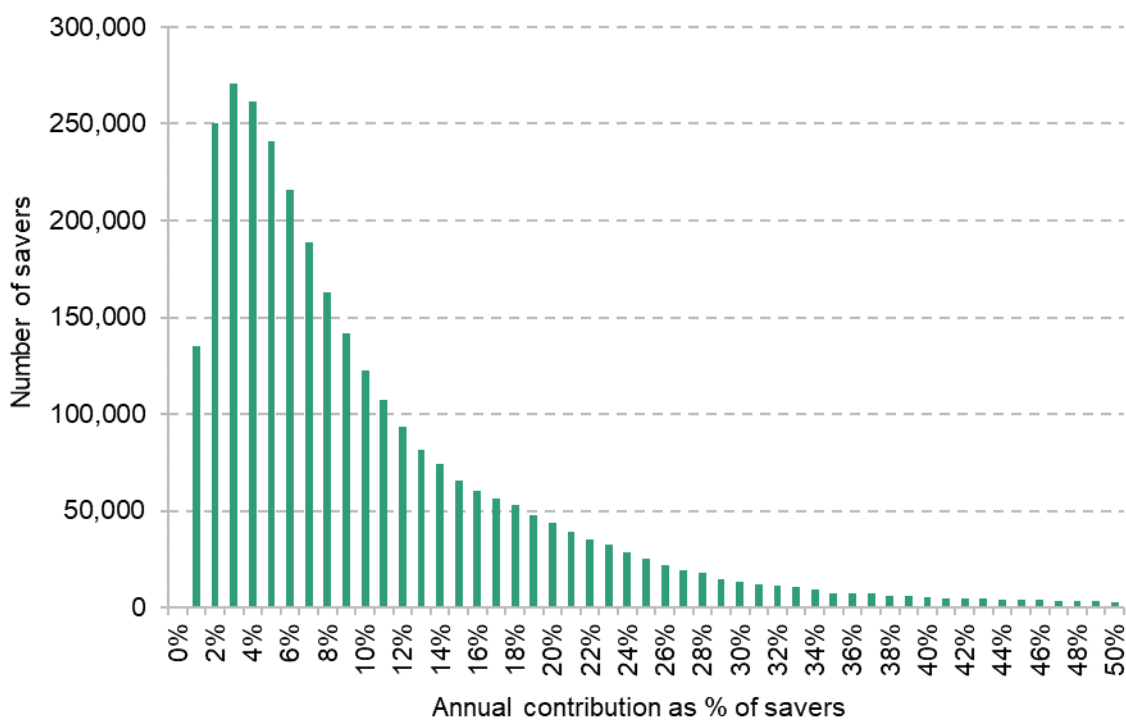


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Notes: 1. Includes distribution.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

**Figure A2.1. Distribution of pension contributions as a percentage of total income, pooling data from 2005–06 to 2014–15**

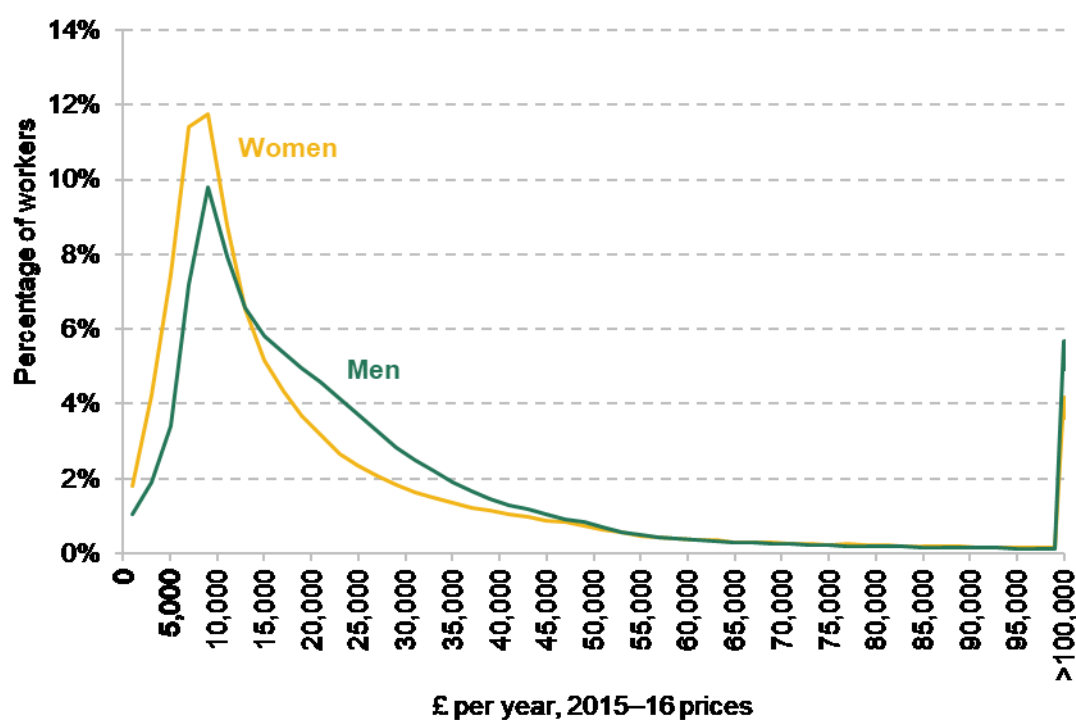


Note: 60,400 savers save more than 50% of their income in a pension.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.

## Appendix 3: Gender differences

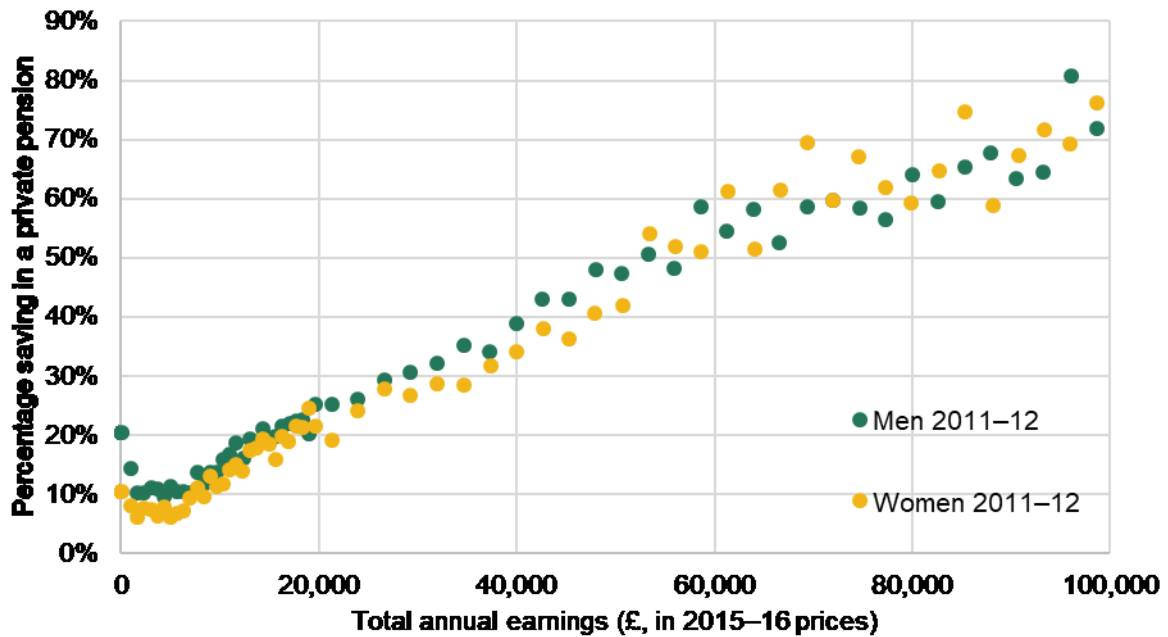
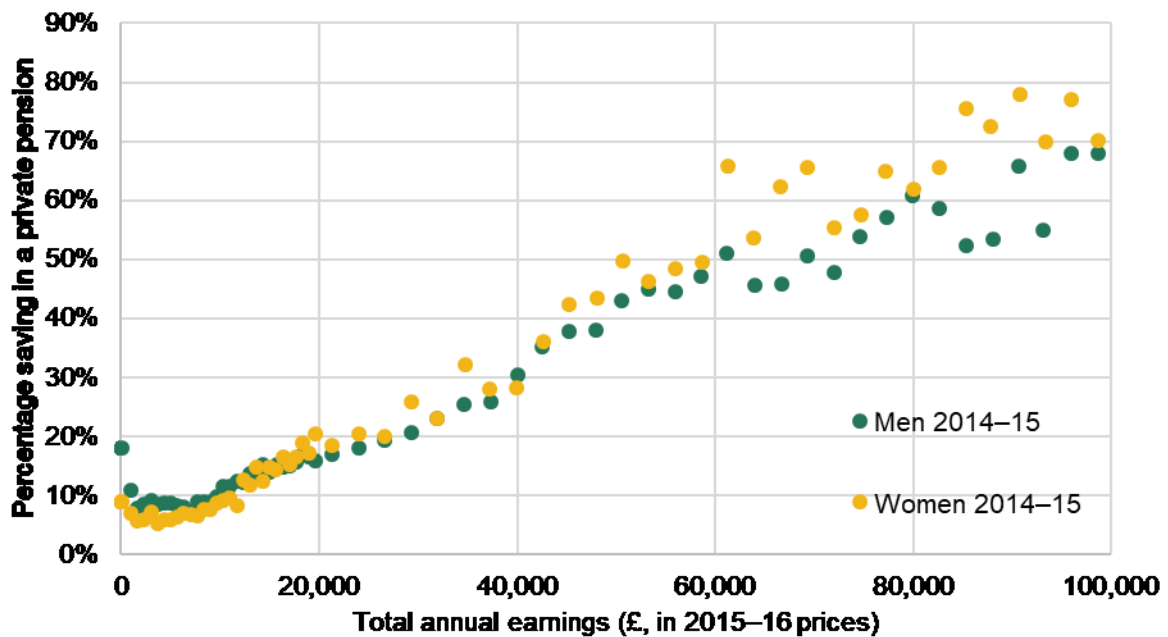
Figure A3.1. Pre-tax annual income distribution of self-employed men and women



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Total income includes income from all sources, in 2015–16 prices.

Source: Authors' calculations using HMRC Self Assessment data for financial year 2005–06 to 2014–15. In 2015–16 prices.

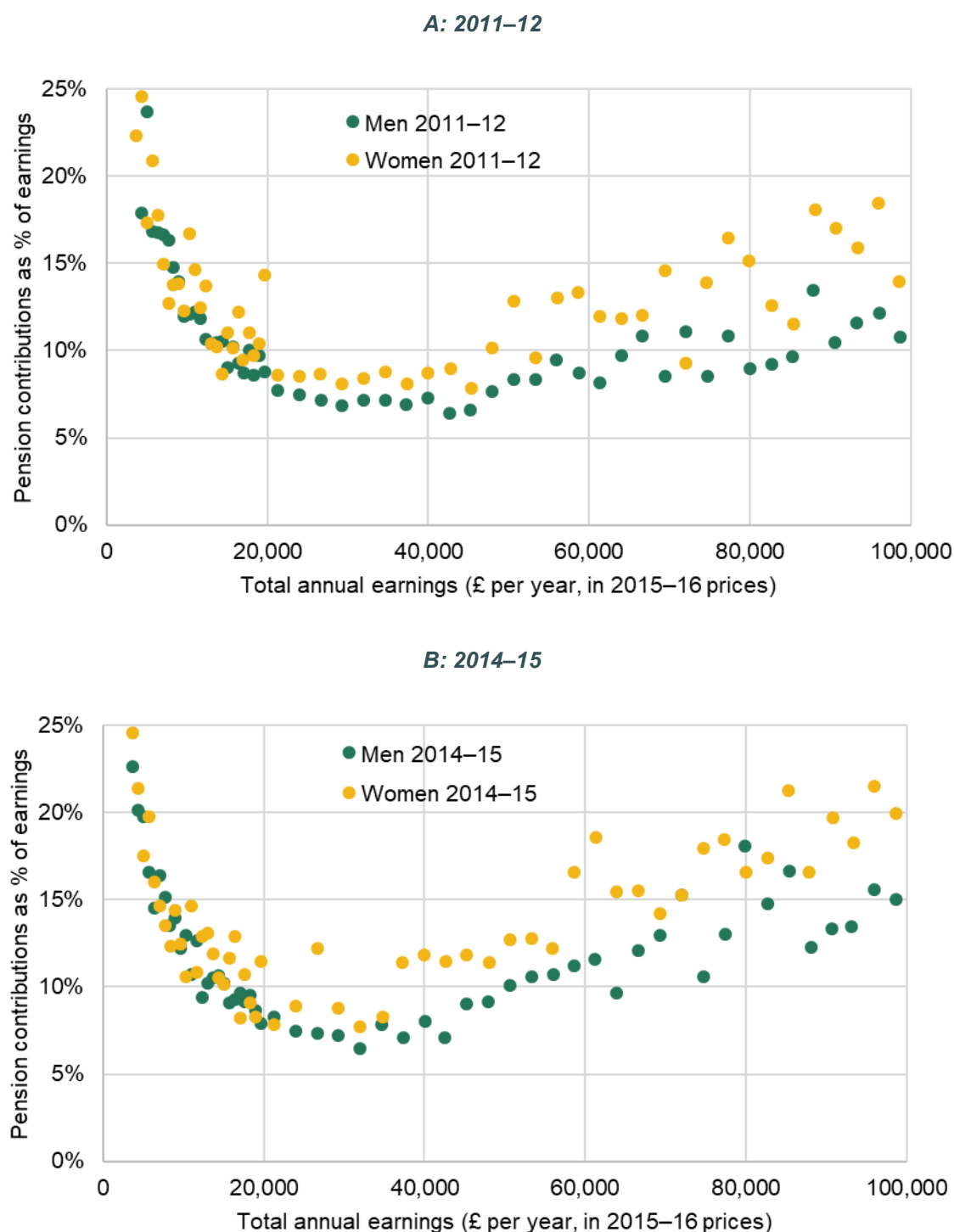
Figure A3.2 Proportion saving in a pension by income

*A: 2011–12**B: 2014–15*

Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Self-employment income includes all gross income from self-employment. The data points are not fully aligned because their location is based on the actual mean income among the people in that bin.

Source: Authors' calculations using ASHE data for financial years 2011–12 and 2014–15 and HMRC Self Assessment data for 2011–12 and 2014–15. In 2015–16 prices.

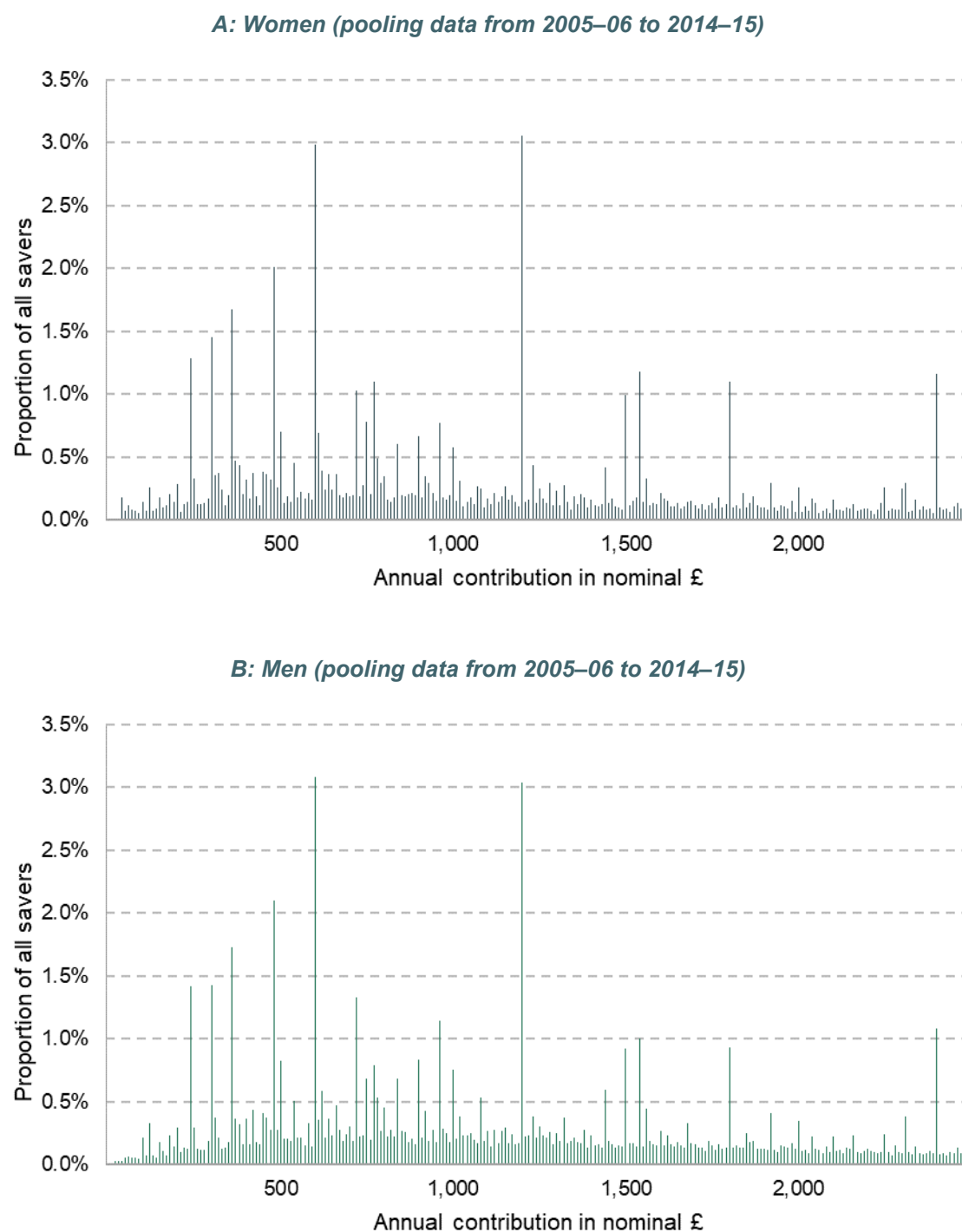
Figure A3.3. Mean contribution rates by income among self-employed savers, by gender



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Self-employment income includes all gross income from self-employment. The data points are not fully aligned because their location is based on the actual mean income among the people in that bin. The contribution rates are winsorised at the 99th percentile.

Source: Authors' calculations using ASHE and HMRC Self Assessment data for financial years 2011–12 and 2014–15. In 2015–16 prices.

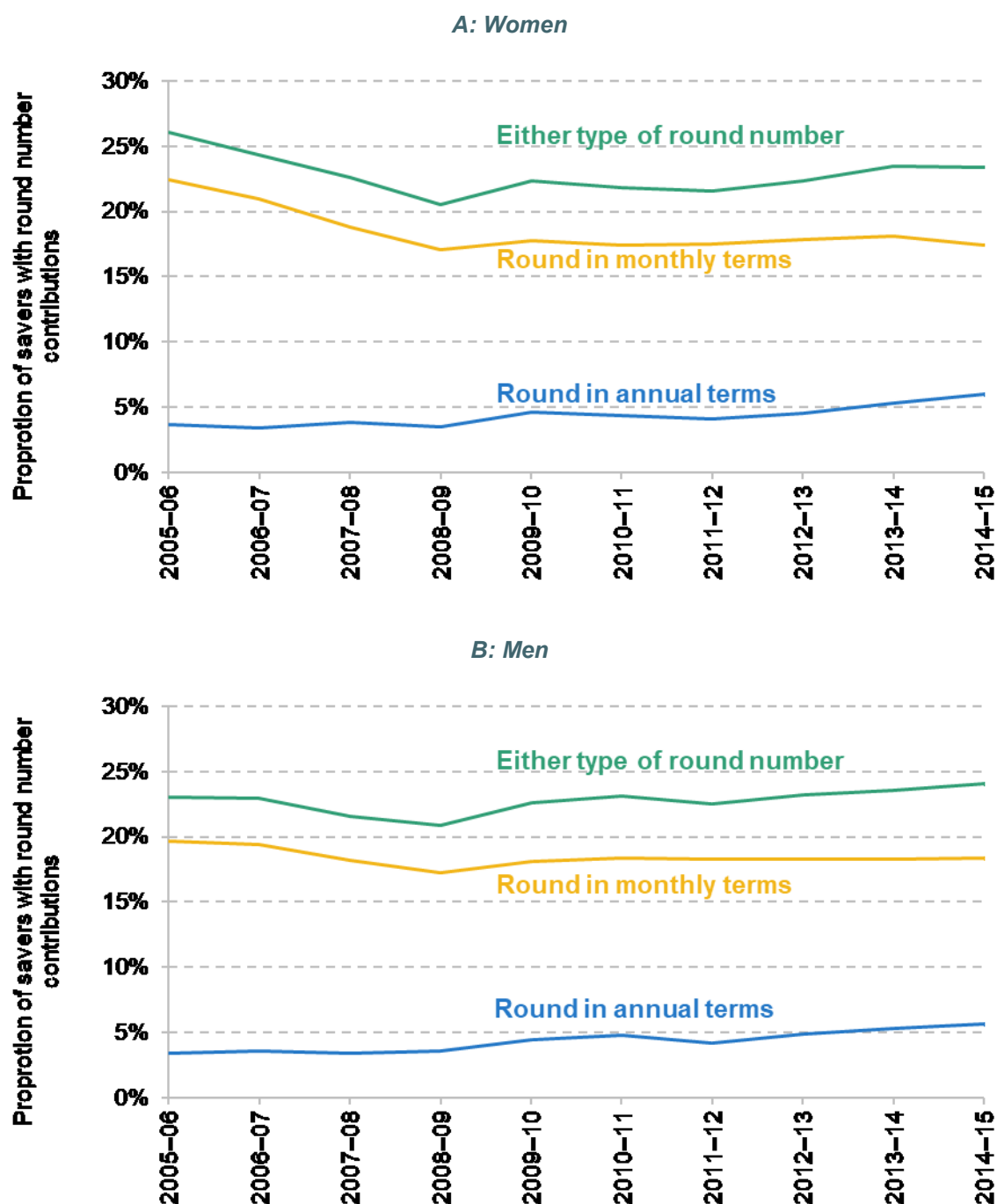
Figure A3.4. Distribution of nominal pension contributions among savers



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Conditional on making positive contributions, 39% of women and 33% of men are saving more than £2,500 per year. In nominal prices.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

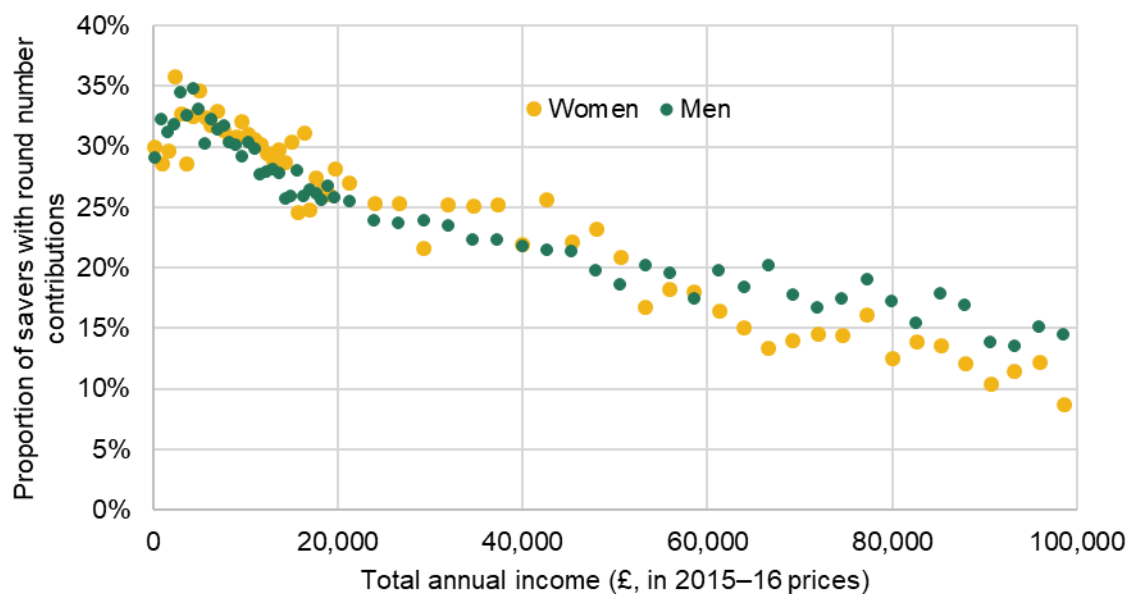
Figure A3.5. Proportion of savers saving a round amount in nominal terms into a pension over time



Note: Annual round numbers are defined as £10, £20, £25, £30, £40, £50, £60, £70, £75, £80, £90, then multiples of £100 up to £1,000, then multiples of £1,000 up to £50,000. The monthly round number definition is based on the same numbers but where annual contribution amounts are divided by 12. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

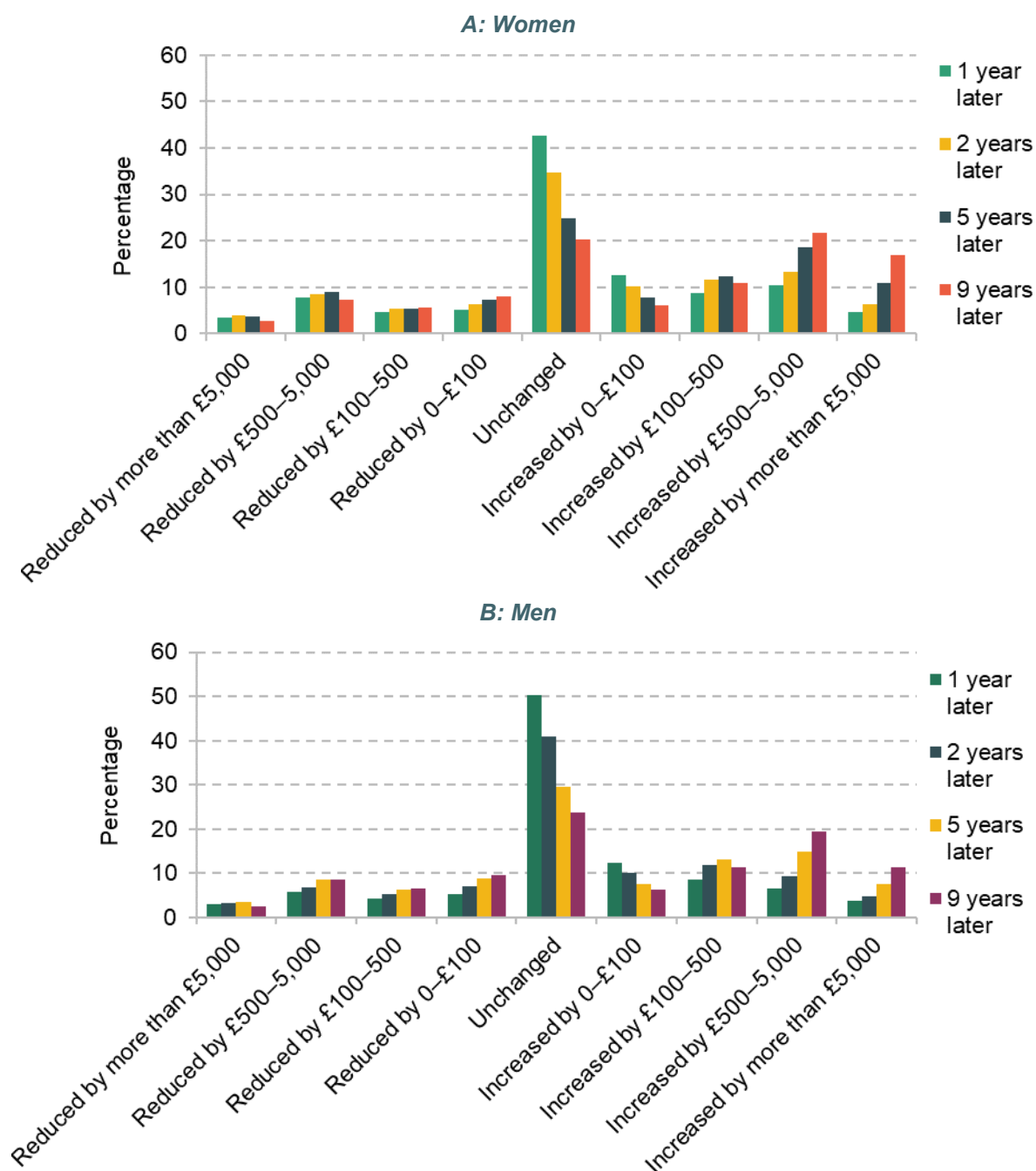
**Figure A3.6. Proportion of savers saving a round amount in nominal terms into a pension, by income**



Note: Annual round numbers are defined as £10, £20, £25, £30, £40, £50, £60, £70, £75, £80, £90, then multiples of £100 up to £1,000, then multiples of £1,000 up to £50,000. The monthly round number definition is based on the same numbers but where annual contribution amounts are divided by 12. The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income. Total income includes income from all sources, in 2015–16 prices.

Source: Authors' calculations using HMRC Self Assessment data for financial years 2005–06 to 2014–15.

Figure A3.7. Changes in contributions among those saving across two periods

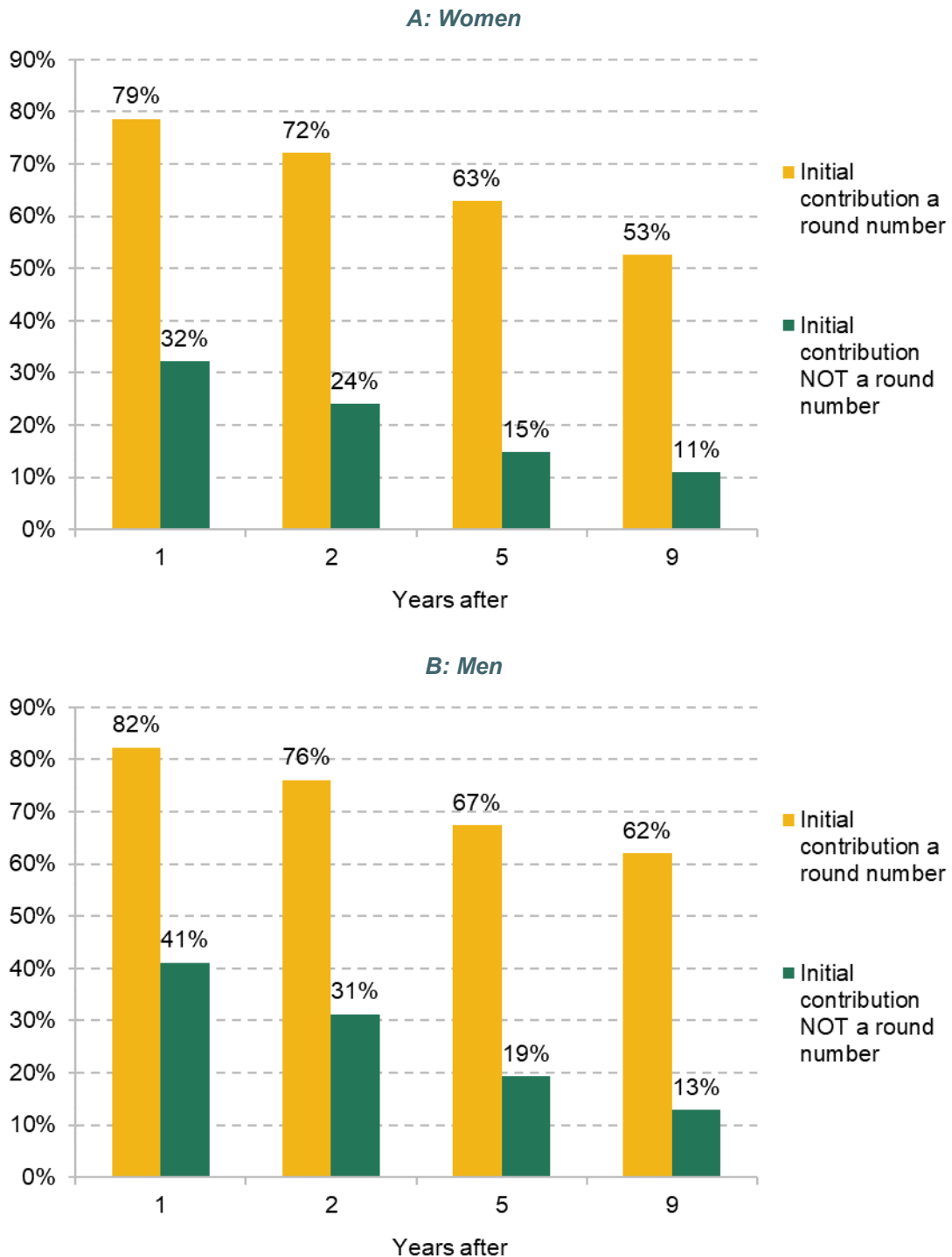


Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.



**Figure A3.8. Proportion saving the same nominal amount in a later year, based on whether their initial contribution was a round figure**



Note: The self-employed are defined as working-age (age 22–64) self-employed who have been self-employed for at least 5 years with no employment income.

Source: Authors' calculations using HMRC Self Assessment data from 2005–06 to 2014–15.