FROM PAYSLIP TO PENSION:

2025

LIFE COURSE IMPACTS ON RETIREMENT SAVING AMONG LOW EARNERS

Pensions Policy Institute
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PART ONE:
PERSISTENT LOW EARNING

This report is the first part launched in the *From Payslip to Pension: Life Course Impacts on Retirement Saving Among Low Earners* series.

It explores the issue of persistent low earning, defined as earning below a full-time Living Wage over an extended period. It also estimates how long different groups are likely to remain low earners and identifies key risk factors, laying the groundwork for future research into lifetime saving capacity.

ABOUT THE PPI

We have been at the forefront of shaping evidence based pensions policy for nearly 25 years.

The PPI, established in 2001, is a not-for-profit educational research organisation. We are devoted to improving retirement outcomes. We do this by being part of the policy debate and driving industry conversations through facts and evidence.

ABOUT THIS SERIES

The *From Payslip to Pension: Life Course Impacts on Retirement Saving Among Low Earners* series will deliver a longitudinal analysis into the life-courses of people who experience low earnings at some point. The series, which will run until summer 2026 will consist of five themed individual outputs.

We will investigate not just their paid work, but their wider circumstances including life events and the households in which they live. The research focusses on how low earners interact with workplace pension savings and aims to identify potential interventions and model their impact both before and after retirement.

This report is part one in the From Payslip to Pension series.

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Executive summary

This report investigates persistent low earning. Low earning, in this research, means earning less than a full-time Living Wage, and persistent means being a low earner for an extended period of time. The research estimates persistence for different groups by estimating how many years they will spend as low earners in the future. This is important because it is necessary to estimate lifetime saving capacity for low earners, which will be investigated in future reports in this series. However, persistent low earning in itself is informative, and this report investigates key risk factors that can predict persistent low earning.

The findings are that:

- Persistent low earning is more prevalent among women, with women spending nearly twice as many years low earning across their career in comparison to men. Having low qualifications, and having children, make women more likely to be persistent low earners. Either of these factors increase the chances of low earning by themselves, but low earning women with both of these risk factors are identified as being especially at risk of being persistent low earners.

- A key risk factor of low earning for men is self-employment. This is distinct from other risk factors because the self-employed are not automatically enrolled in Defined Contribution workplace savings schemes. Nonetheless, while self-employed men are more likely to be low earners than employed men, they are equally likely to be persistent low earners. This suggests that while self-employed men are more likely to have a spell of low earning than employed men, the spell of low earning itself is equally as long as it is for employed low earning men.

- The precise definition of low earning is important, with differing rates of persistent low earning across different income levels within the low earning population. Those who earn less than a full-time Living Wage are significantly more likely to be persistent low earners, than those who earn below the trigger income for automatic enrolment.

- Low earning itself is a predictor for future low earning. The definition of low earning affects the degree to which this is true, but this suggests that low earning is a result of underlying factors, rather than a random event that the whole population is equally susceptible to.

- Other factors are explored, namely living with a partner, and youth. These are shown to have less bearing on persistent low earning. This does not necessarily mean that these risk factors are not important for determining whether different groups can afford to save.

Introduction

This project aims to fill in knowledge gaps around low earners in a pensions policy context. It is difficult to create pensions policy, and specifically to design parameters of automatic enrolment, that adequately serves this group. Automatic enrolment accounts for most workplace pension participation and has features to exclude some low earners. Policy makers must balance the risks of needlessly excluding some people from workplace pension saving, with the risks of guiding other people in vulnerable financial positions into making payments towards a pension.

This report examines persistent low earning. In this research, low earning refers to low earners who do have some earnings, but less than a full-time Living Wage, and persistence refers to the proportion of their working life that they spend as low earners. This is in part to inform future phases of the analysis, which will examine representative life courses of low earners in further detail. However, the insights into persistent low earning are themselves important, as they highlight possible areas of policy intervention, and identify which characteristics may be used to assess a low earner's pension saving needs.

This project uses the Understanding Society[1] dataset to estimate the life courses of low earners. This is done by creating a map of the different situations a low earner may be in at each age, and the most likely ways that their circumstances might evolve as they age. This reveals which low earners spend the largest proportion of their working life low earning, and what the risk factors for long term low earning might be.

What don't we know about low earners?

Low earners are poorly understood as a societal group, containing different types of people who have different reasons for low earning, and different levels of financial security. This makes it hard to design policy that serves all low earners in an adequate way, and is especially true of pensions, where automatic enrolment policy has features which depend on earnings, such as the trigger income and lower earnings limit. Some research exists that examines low lifetime incomes[2], but generally, it is hard to apply findings from existing research to low earners, rather than just all people on low incomes. For example, existing research includes people with benefits income but no earnings, who are not affected by automatic enrolment policy.

In previous research[3], the PPI examined low earners and automatic enrolment, specifically by analysing the £10,000 trigger income, under which an employer is not required to enrol employees into a pension scheme. The findings were that many low earners could safely be enrolled into a pension scheme because, although their earnings are low, they have other safety nets that mean that they can afford to set aside money for a pension. One example of this is young people who live with parents with high incomes; another example is workers near retirement age who have assets such as a home and are low earning because they are working part-time as they wind down for retirement.

However, the research also found that there is a minority of low earners who have no identified safety net. Simply removing the trigger income, without taking some measure to safeguard this minority, could endanger them by taking away money that they have an immediate need for.

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[1] University of Essex (2024)
[2] Centre for Longitudinal Studies (2017)
[3] PPI (2022)

This research highlights the differences between different types of low earners, and offers a starting point for how future policy might distinguish between those who should be saving into a pension, and those who shouldn't. However, more information is needed. The previous PPI research examined low earners at a single point in time. This is useful for low earners who are nearer the end of working life, who may be identifiable as having some kind of existing safety net, such as owning their own home. However, this does not reveal which low earners are at risk of having a low average income over their life, and what the risk factors for this may be.

This research assesses the degree to which different types of low earner are persistent low earners. Persistent low earners are those who are low earning in the long term, and precise definitions for this can vary. In this report, a measure is used that predicts the expected number of future years spent low earning. In other research, the Department for Work and Pensions (DWP) has defined a low earner as someone who has been low earning in at least 3 out of 4 annual interviews[4].

Identifying which low earners are persistent is important from a policy perspective. A persistent low earner will have a low lifetime income and is also more likely to be able to maintain their standard of living in retirement with a low income. They may need as much income in working life as possible and may rely more heavily on the State Pension or benefits in retirement. A transient low earner, on the other hand, may still have the capacity to accumulate a large pension pot over their life, and may require a larger retirement income to maintain their pre-retirement standard of living.

This research highlights which low earners are most persistent and identifies risk factors which make a low earner more likely to remain a low earner at different points in their life. This provides insight into the lives of low earners, and enables the identification of potential policy interventions, or further research based on representative life courses.

What does this research deliver?

In order to understand the modelling results, it is useful to understand the modelling approach that is taken. Below is a brief overview, with full details available in the Technical Appendix.

This research uses a modelling approach which tries to build a roadmap of the working life of low earners. It does this using the Understanding Society survey. The survey is longitudinal, meaning that respondents participate in the survey multiple times. This means that there is information on what these respondents were earning at different ages in their lives, as well as other information on various personal, social, demographic, health and employment variables.

From this, it is possible to construct a set of 'states' at every age according to different combinations of personal characteristics held at that age. Within each age, an algorithm identifies which of the variables in the dataset are best for dividing low earners into states, where the states have as big a difference in persistence as possible. For example, at age 30, the algorithm might identify the key variables for a woman as being motherhood and marriage status, creating four states: married mother, single mother, married woman with no children, single woman with no children. An extra variable could be included to represent earnings – either not earning, low earning, or high earning – so that these 4 states would become 12, and the earning status of a respondent would be captured at each age. These states can then be connected by examining the respondents in the survey who were present at multiple ages – for example, someone who was in the survey aged 30 and 31. By examining who moved from which state to which other state, each state can be given the probabilities of transitioning to every other state at the next age.

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[4] DWP, 2024

This means that, for every state, the expected future number of years spent low earning can be calculated, by examining the probability of following each path through the remaining states, and noting how many years in each path are spent low earning. This measure is used throughout this report to indicate the degree to which a person will be low earning in the future. For example, if an 18 year old has 10 years of expected low earning in their future, that means that the most likely outcome for a person like this is that 10 years at any point between 18 and 66 could be spent low earning. If a 40 year old has an expected 5 years of low earning in their future, it suggests that the most likely outcome is that any 5 of the years between age 40 and retirement age could be spent low earning. The remaining years may be spent either as a high earner, or not earning anything at all.

The variables that the algorithm identifies at each age are also noted at several points throughout this report and referred to as risk factors, as these are useful for understanding the challenges that different low earning groups face, and what may cause somebody to spend more time as a low earner.

Full details of how the algorithm works, as well as considerations such as sample weighting, sample sizes, and cohort effects are available in the Technical Appendix.

How low is low?

How can low earners be defined?

There are multiple viable options for defining low earnings. Given that low earnings are being examined within the scope of automatic enrolment, earnings are taken to mean earnings from an employer only. However, to define low earnings, an earnings threshold is needed. This research explores the implications of using these different thresholds, and finds that even within the group of people that could be considered low earners, it is important to make the distinction between those with the very lowest incomes, and those who are closer to the high end of low earnings.

One option for selecting a definition of low earning is to identify the boundaries that are used in current policy, such as the £10,000 automatic enrolment trigger. The advantage of this is that any findings that are relevant to this definition are especially relevant in policy terms. The disadvantage is that this may not reflect a meaningful boundary within the low earning population – especially given that the trigger income has been frozen at £10,000 a year since 2014/15, shrinking in real terms, so that it may no longer accurately capture what it was originally intended to reflect. £10,000 annually equates to just under 16 hours a week on a Living Wage.

Another option is to select a definition that is based on some aspect that is more relevant to earnings, such as earning less than the equivalent of an annual full-time Living Wage, which in 2025 is £24,570[5]. This approach may capture low earners better, at the expense of translating less neatly to policy.

This report mainly uses the full-time Living Wage as a threshold, but the automatic enrolment trigger income is also explored further. It should be noted that throughout this report, genders are considered distinctly from one another, as women are more likely to be low earners, and men and women have different career trajectories. As such, findings are presented for one gender or the other, and more findings are presented with relation to women, to represent the majority of low earners.

To be clear, when using the full-time Living Wage as a threshold, part-time workers are still considered, as these workers also need consideration from a pensions policy perspective. In this way, full-time workers whose salary is lower than a Living Wage would be low earners, and so would part-time workers whose salary and hours do not bring their total annual earnings above £24,570.
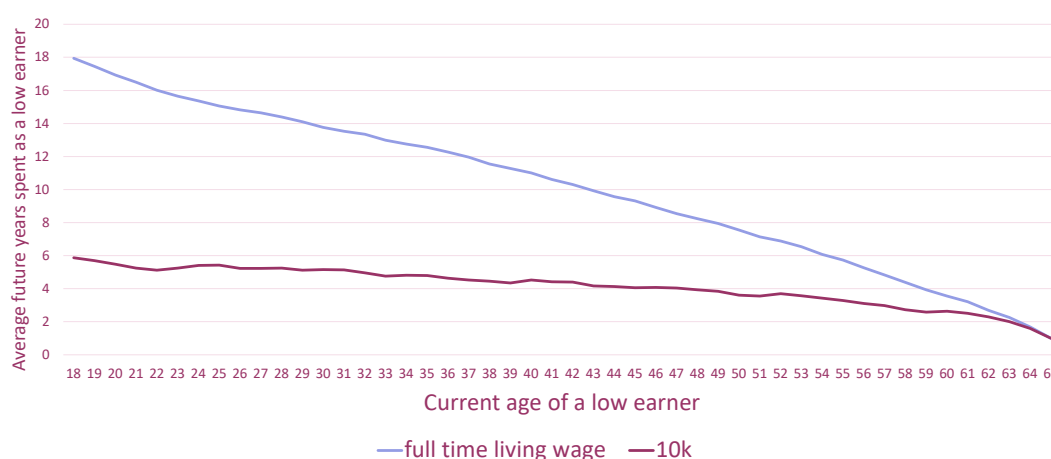
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[5] Living Wage Foundation, 2025

Very low earners are at more risk of staying at this level

Exploring multiple definitions of low earning is important, as there is significant variation in the persistence of low earning depending on which definition is used. If low earnings is defined as being under £24,570, then an average 18 year old female low earner can expect 17.9 years of low earning throughout her life. If this definition is changed to £10,000, then she can expect 5.9 years of low earning throughout her life.

It is worth noting that, if using the £10,000 definition, most years of low earning appear to happen near the end of working life. An 18 year old female low earner has an expected 5.9 years of low earning in her future, but by age 50, the expected number is 3.6 years, suggesting that low earning (when using this definition) is more persistent at later ages.

Levels of persistent low earning vary according the definition of low earning
Average number of future years of low earning women at each age, by threshold to qualify as a low earner

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Y-axis: Average future years spent as a low earner
X-axis: Current age of a low earner (18 to 65)

— full time living wage   — 10k

Low earning itself is a predictor of future low earning

The fact that an individual is a low earner is, by itself, a strong indicator that they will be a low earner in the future. This is especially apparent when using a low earning threshold of £10,000, in which case 22 year old women will spend an average of 3.8 years low earning, regardless of their current income as 22 year olds. By contrast, a 22 year old female low earner is projected to be a low earner for 5.1 years in the future. The discrepancy between expected years of low earning for low earners, and expected years of low earning for the wider population, is smaller between the ages of 18 and 22 than it is for subsequent ages: an 18 year old female low earner has an expected 5.9 years of low earning, compared to 4.9 for all women. However, a 25 year old female low earner has an expected 5.4 years of future low earning, compared to 3.5 for all women. This suggests that low earning at 22 or under is less of an indicator of future low earning than it is at later ages.

Low earning itself is a predictor of future low earning

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Average number of future years of low earning for women at each age, for low earning women only, and for all women

low earners — whole population

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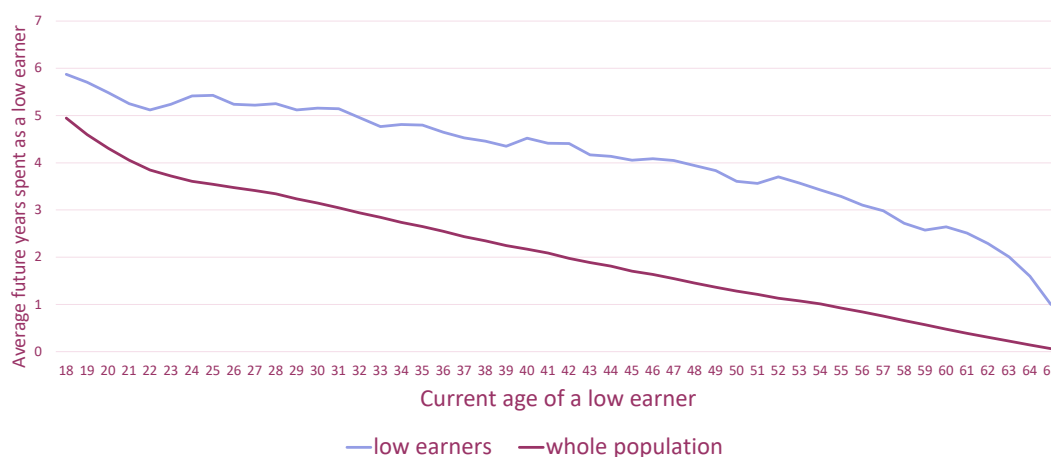
Gender differences

Gender and career

Women are particularly likely to be low earners: women are 50% more likely than men to be to be paid below the Living Wage[6]. However, the differences between male and female low earners go beyond a pay gap. The male and female low earning populations have different working life trajectories and different risk factors. This section will illustrate this, using a full-time Living Wage as the threshold for low earning.

In terms of risk factors, there is an especially strong link between women's low earning and motherhood. There is also a relatively large proportion of low earners among the female population at every age.

By contrast, men are most likely to be low earners at the beginning and end of working life. For low earning men near retirement, there is also a higher rate of self-employment than there is among low earning women near retirement.

Women are also more likely to be persistent low earners. This research considers the male and female populations separately, ensuring that gender nuances are not lost in the analysis. This section will highlight the vulnerability of male and female low earners to persistent low earning,

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[6] Living Wage Foundation (2024)

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Overall gender differences in the low earning population

Women are more likely to be low earners. Of the dataset used in this research, and using a full-time Living Wage as the threshold for low earning, women are more likely to be low earners than men at every age. However, the disparity between genders varies with age.

Men are most likely to be low earners at the beginning and end of their careers, and this is where the gender disparity in low earning is smallest – at age 20, 39% of men are low earners, compared to 50% of women. Similarly, at age 61, 15% of men are low earners, compared to 26% of women. However, this disparity is amplified in the middle of working life, and is greatest at age 46, where 10% of men are low earners, compared to 37% of women. To clarify, those who are not low earners may either be earning more than a full-time Living Wage, or not earning at all.

Women are more likely to be low earners at every age

Proportion of the total population who is a low earner, at each age, by gender

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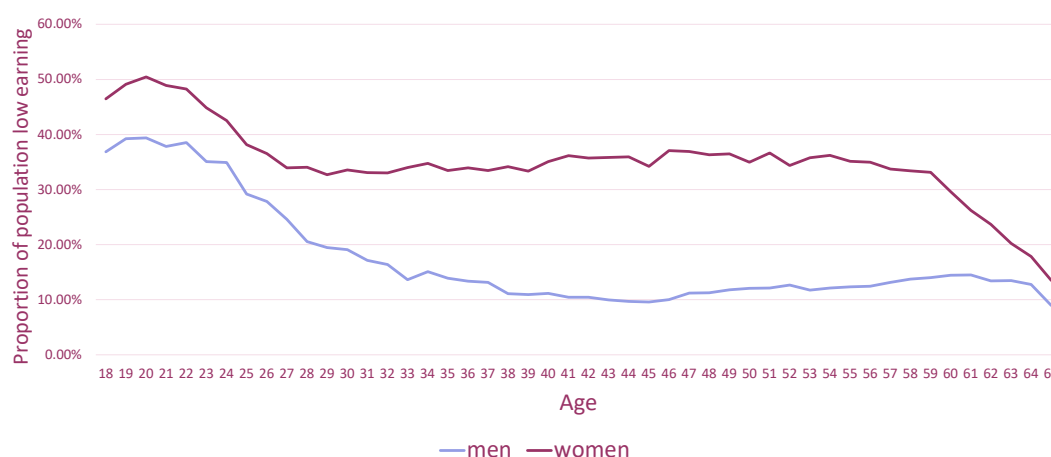
Overall persistency

As well as being more likely to be low earners, women are also more likely to be persistent low earners. A 22 year old male low earner has a projected 8.0 years of low earning, while a 22 year old female low earner has a projected 16.0 years of low earning. It is also worth noting that this analysis does not control for other factors. That is to say, these figures suggest that women may have around twice as many years of low earning in their future as men, but are not suggesting that this difference would exist for a man and a woman with otherwise identical circumstances.

Female low earners are roughly twice as persistent as male low earners

Expected future years of low earning for male and female low earners

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Current age of a low earner

men — women

Risk factors for each gender

The risk factors for men and women appear to be different, with women's persistent low earning predicted by relatively well by motherhood and qualification level. For men, self-employment is a strong predictor of low earnings, but not persistent low earnings. Qualification levels do also predict persistent low earning in men, but to a lesser degree than women. Each of these risk factors is discussed in the following sections.

Motherhood

Motherhood and career

It has been established that most low earners are women. While there are multiple factors involved, the most crucial is motherhood. Previous PPI analysis[7] has demonstrated that a third of all low earners in the 30-49 age group are mothers and found that, even when a mother's youngest child is 14, she is more likely to be a low earner than immediately before having her first child. The effect of motherhood on women's pay is often referred to as "the motherhood penalty"[8].

Many mothers may spend a large number of years juggling childcare responsibilities with part-time, and possibly low paid, work. It is important to understand the relationship between motherhood and low earning, not just because mothers are a large section of the low earning population, but also because there is a large range of outlooks for low earning mothers. Some may be low earning as part of a couple with a high combined income, and have an adequate household income; others may be working as much as they are able to, but unable to earn as much as they need because of caring responsibilities.

How much does motherhood affect low earning?

It is difficult to assess the extent to which motherhood is the sole driver of gender inequality in low earning. A possible way to assess this is to compare low earning among men, and among women who have not had children. However, even this is difficult to assess using this methodology, as women in the survey who have not yet had children may still do so in the future. It is also difficult to assess, for all respondents in the survey, whether a woman has adult children, meaning that some women who are classified as never having had children do, in fact, have adult children. To mitigate this, the 30-49 age group is assessed, minimising the number of women captured in this group who ought to be excluded.

Nonetheless, comparing the persistence of low earning men and low earning women who have no identifiable children offers interesting results. It shows a closer parity between genders, suggesting the degree to which motherhood is the key driver of low earnings in women. While this explains some of the gender disparity, there may still be different factors that drive low earning in men, and low earning in women without children. The results suggest that, for low earning 30 year old women, those who will be raising a child at some point between 30 and 49 can expect an average of 9.3 years of low earning during this period, and a low earning 30 year old woman who will not raise a child during this period can expect 7.1 years of low earning during this period. By contrast, all low earning 30 year old men, regardless of whether they will have children at any point, can expect 4.5 years of low earning during this period.

This suggests that the largest driver of persistent low earning among women in this age group is motherhood, but also suggests that if motherhood were not a factor, there would still be some gender disparity. This result also does not indicate how much time mothers are out of the workforce altogether, as in the years they are not low earners, they may either be not earning at all, or earning at least a full-time Living Wage.
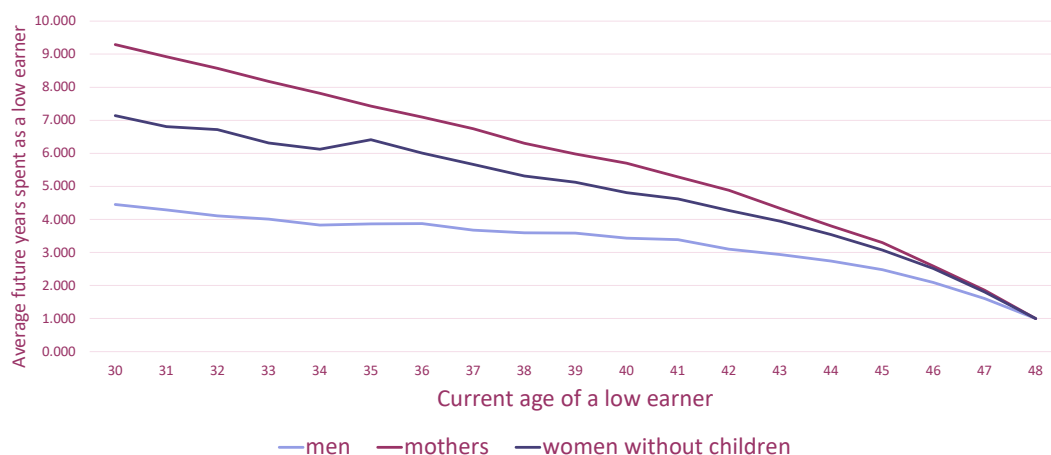
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[7] PPI (2023)
[8] Mohring (2017)

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Motherhood is a predictor of persistent low earning, but other factors may also make women more persistent low earners
Proportion of the total population who is a low earner, at each age, by gender

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Risk factors that combine with motherhood

There are still a wide range of outlooks among low earning mothers, so it is important to identify factors that can determine their outlook most effectively. The next section explores education qualification level, which is a further risk factor that has been identified for all female low earners, regardless of whether they are mothers. The next section will explore how qualification level can predict the persistence of low earning among low earning mothers specifically, as well for low earners generally.

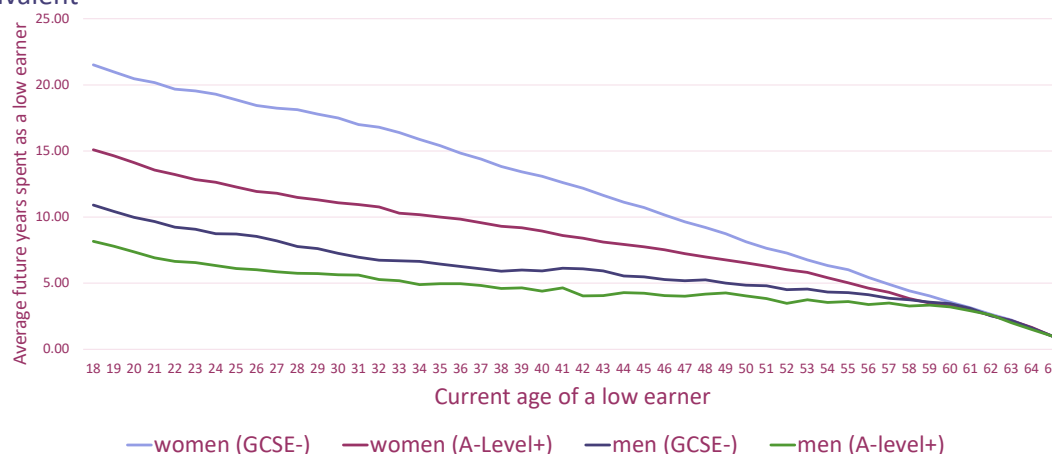# Qualifications

Qualifications and earnings

The interaction between qualification level and earnings is well studied and has been shown to affect both men and women. It has been demonstrated that education level has a significant impact on men's earnings[9], with higher education resulting in a £240,000 increase in gross lifetime earnings for men, and £140,000 for women.

However, the findings of this research identify that qualification level is a strong predictor of persistent low earning in women, but not in men. This may be sensitive to the precise definition of low earnings, with men whose income is affected by lower qualifications still earning enough to not be classified as a low earner.

In this research, we find that low earning women whose highest qualification level is GCSE or equivalent may experience 21.5 years of low earning in their working life. A low earning woman who has the equivalent of an A-level, or some higher qualification like a degree, can expect an average of 15.1 years of low earning in her working life. By contrast, for men, the figure is 10.9 years or 8.1 years respectively. This is not to suggest that men do not experience significantly lower earnings as a result of qualification level, but that low qualifications are less likely to push men below a full-time Living Wage.

Low qualifications are a predictor of persistent low earning, especially in women
Expected future years of low earning for low earners, for men and women whose highest qualification is a GCSE or equivalent, or at least an A-level or equivalent

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Average future years spent as a low earner (y-axis: 0.00 to 25.00)
Current age of a low earner (x-axis: 18 to 65)

— women (GCSE-) — women (A-Level+) — men (GCSE-) — men (A-level+)

Why do qualifications affect women's low earning more than men's?

This result shows that persistent low earning in women is sensitive to qualification level, to a greater extent than it is for men. There could be factors related to qualification level that drive this, such as a
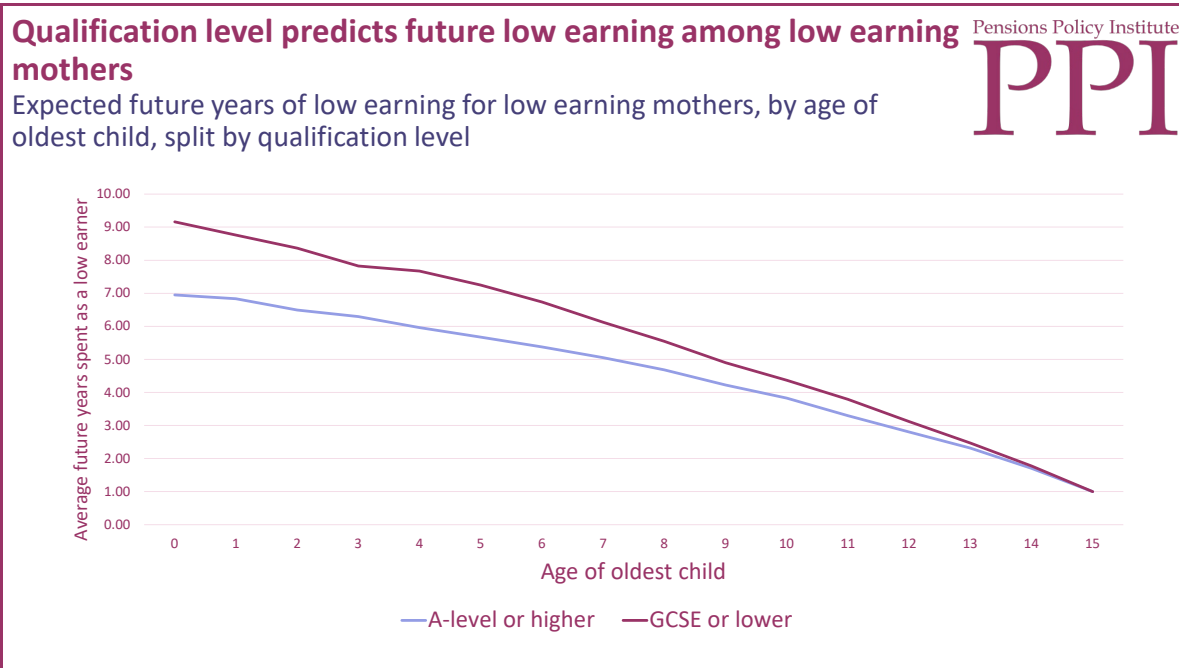
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[9] IFS, 2020

pay gap between industries that typically recruit either mostly men or mostly women, but do not require higher education qualifications.

To better understand persistent low earning in women, it is important to understand how low qualifications and motherhood interact. The modelling approach was modified to analyse mothers: instead of tracking the status of respondents by age, the status of mothers was tracked by the age of their first child. When analysing mothers in this way, we see that a mother who is a low earner when they have their first child can expect 9.2 years of low earning before their first child is 16 if they have qualifications equivalent to GCSEs or lower, but 7.0 years if they have qualifications at least as high as an A-level.

The age of the oldest child is used so that a mother's life can still be modelled as a linear progression of ages, which is a requirement for the modelling approach used in this research. This does lose a key nuance which is that mothers may have multiple children with potentially large age gaps. Nonetheless, it appears that having low qualifications adds an average 2.2 years of low earning to a mother's life before her first child turns 16. This does not fully account for the gap between low earning women with different levels of qualifications, where low qualifications add an average of 6.4 years. This does not completely disentangle motherhood and qualifications, as there may still be correlations between the qualifications a woman has, and whether she has children, and if so, how many children she has and at what age. Nonetheless, this suggests that low qualifications may create significant amounts of low earning regardless of motherhood.

It is important to separate the effects of motherhood and low qualifications, because this confirms that women with low qualifications who never have children, and mothers with high qualifications, are both still at-risk groups. It also highlights that mothers with low qualifications are an especially high-risk group.

Qualification level predicts future low earning among low earning mothers

Expected future years of low earning for low earning mothers, by age of oldest child, split by qualification level

Self-employment

The self-employed are considered to share many similar risks to low earners, with less pension coverage than the employed, but also with more volatile incomes[10], which creates uncertainty as to how they should save in working life. However, they are not in scope for automatic enrolment as they do not have an employer, so policy cannot be applied in the same manner.

Analysis of the self-employed has been undertaken, but the figures in this section are not directly comparable to the figures in other sections of this report. This is because the earnings that are considered when calculating a respondent's low earner status are different, and account for all gross earnings, rather than just employer pay. However, a full-time Living Wage is still used as the threshold for low earnings.

How are self-employment and low earnings related?

The self-employed are another group that are identified as being generally poorly served by the pensions system, as they are not automatically enrolled into a workplace pension. As a result, the self-employed are at risk of undersaving for retirement regardless of earnings, with employees having a pension participation rate of 79%, compared to 19% of self-employed people with the same earnings, in 2023/24[11].

This creates a dilemma as to whether earnings from self-employment should be included in the definition of low earnings. Someone who earns a small income from self-employment will not be eligible for automatic enrolment, so from one perspective, is similar to someone who does not earn anything.

However, from another perspective, this person is likely to have similar characteristics as other low earners, and if self-employment is an indicator that someone may become a persistent low earner, then this is worth identifying. Self-employed low earners may miss out on future policy interventions that target low earning employees, or may be poorly served by future policy interventions that target the self-employed, but are only appropriate for higher earners.

Self-employment is a key factor when considering low earning in men. Men are more likely to be self-employed than women, with the number of young men working for themselves in construction alone being almost equal to the total number of young women in self-employment[12]. At the same time, the self-employed typically earn less compared to employees: in 2018/19, over half of the solo self-employed earned less than £300 a week, compared with just a third of employees[13].

Among men, a larger proportion of the self-employed are low earners, compared to employed workers. This is not true at the beginning and end of working life, where the proportions are more similar, but is apparent at most ages, with the largest gap being at 34: 20% of men who work for an employer are low earners, compared to 51% of men who are self-employed.
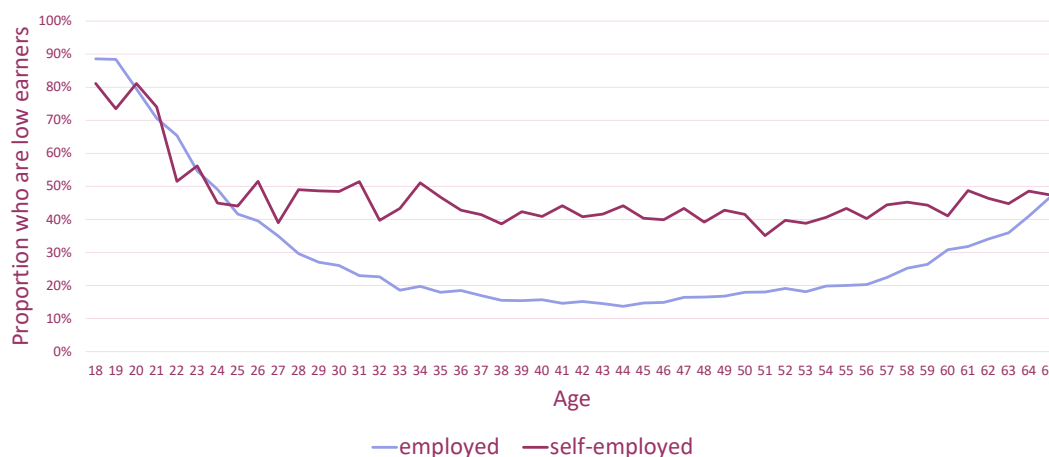
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[10] IFS (2023)
[11] FRS (2024)
[12] ONS (2019)
[13] IFS (2020)

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Self-employed men are more likely to be low earners than employed men in the middle of working life

Proportion of self-employed, and employed, men who are low earners at each age

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employed — self-employed

However, when analysing the expected future years of low earning of these groups, there is no matching disparity: a 30 year old male self-employed low earner has 9.2 expected years of low earning, compared to 9.3 years for his employed counterpart. This suggests that, while the self-employed are more likely to be low earners, those that are, are not at a higher risk of being persistent low earners. That is, self-employed men are more likely to enter a spell of low earning than employed men, but at the same time, if a man is a low earner, whether he is self-employed or employed does not predict how long he will be a low earner.

Self-employed men are no more likely to be persistent low earners than employed men

Expected future years of low earning, for self-employed and employed male low earners, by age

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employed — self-employed
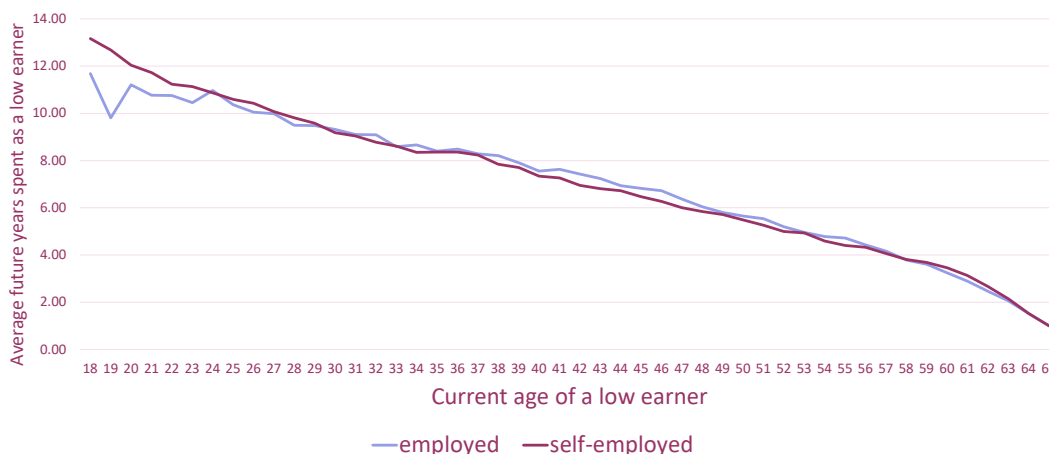
It should be noted that when calculating expected years of future low earning, it is accounted for that currently self-employed low earners may escape low earning by becoming employees. This may be

especially significant given that, among the low-paid self-employed, 57% of those who become an employee escape from low pay, compared to only 24% of those who stay self-employed[14].

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[14] SMF (2016)

Living with a partner

How does a partner affect low earnings, career, retirement and living costs?

The research indicates that another risk factor is whether or not a low earner is living with a partner. That is, at different points in a person's life, whether or not they are living with a partner may help to determine their outlook in terms of low earning. However, whether or not a low earner is living with a partner at a given age has relatively little bearing on their future low earning outlook compared to the other risk factors identified. It should be noted that when calculating expected future years of low earning, it is taken into account that a person who currently lives with a partner may not in the future, and vice versa. This may be a contributing factor to the small disparity between the two groups.

The analysis suggests that female low earners who live with their partners in their twenties are more likely to be low earners for longer: at age 26, this gap is most apparent, where those living with a partner have an expected 15.5 years of low earning, compared to 14.6 for those who do not live with a partner. However, this disparity narrows further and even reverses at some ages, to the point that the disparity between the two groups may not be meaningful.

This demonstrates that persistence is not the only important measure in regards to low earning. These figures do not reflect how affordable saving becomes when a low earner has a partner. A single low earner and a married low earner may spend a comparable amount of time low earning, but if the married low earner has a high household income, pension saving may be more appropriate for them than the single low earner.

Furthermore, in retirement, single people are generally identified as facing greater pension challenges than those with partners. Single people are unable to save by sharing living costs in the same way that couples can, and in retirement, State Pension entitlement is calculated on a purely individual basis, meaning that couples can receive two full State Pensions despite not having double the living costs of a single person.

Having a partner has a small effect on future low earnings

Pensions Policy Institute
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Expected future years of low earning for female low earners, for those who are currently living with a spouse, and those who are not

single — couple

Young people

How is low earning different for the youngest workers?

Young low earners are an especially interesting group from a policy perspective, because with the longest time until retirement, they may be most affected by some policy decisions. Young people are particularly likely to be low earners. This can be seen in the findings in earlier sections: 37% of women and 28% of men are low earners at 22. They are also distinct from older age groups, with less disparity in the proportion of men and women with low earnings, and not yet being affected by many of the risk factors that predict persistent low earning in older groups.

It would be useful to understand whether young people should be encouraged to build a significant amount of pensions wealth earlier in life. This would allow them to make the most of long-term investment returns and build a saving habit, but if they are at risk of persistent low earning or financial instability, pension saving may be inappropriate for them.

For earners under 22, the data suggests that low earning at this age is less indicative of persistent low earning. This is visible in the graph of future years of low earning using the £10,000 threshold, for female low earners and for all women, where the disparity in outlooks is smallest under the age of 22.

However, it also appears that at least for young men, low earning under 30 is less indicative of future low earning. This can be seen in the graph of future low earnings for men, where the graph is "steeper" at younger ages. Between 22 and 30, the expected future years of low earning for a male low earner falls by 1.4 years, but does not reduce by another 1.4 years until age 43, suggesting that low earning between 22 and 30 is less persistent than it is at later ages. The graph for women does not "flatten out" in the same way, but this may relate to other factors such as motherhood.

This indicates that low earning at a young age is not as strong an indicator of future low earning, as it is for older groups. Instead, it appears that the factors that have already been identified, such as motherhood, qualifications, and self-employment are the best indicators of future low earning for young people once they do have one of these risk factors.

Other risk factors

This research indicates that there are many risk factors that can determine outlooks in terms of low earning. The risk factors given in this report are not an exhaustive list. Rather, they are the risk factors that can determine outlook in a particularly strong way, or have been identified as risk factors for low earning in other research.

Among the other risk factors identified were health and disability, caring, and geography. Presenting figures for these risk factors in the same way that other figures have been presented may show similar gaps in outcomes. However, these have not been presented because these findings may not be reliable as a result of low sample sizes, correlating factors, and other nuances that are would not be apparent from presenting the results in the same way that other results in this paper have been presented.

This is not to say that these are not also risk factors for low earning. Other risk factors such as these would be interesting areas for future research.

Conclusions

This research highlights a key factor to consider when designing policy around low earners: some low earners are more persistent than others. Persistent and transient low earners have different needs, both in working life and retirement, and policymakers who aim to design pensions policy around low earners need to be mindful of the wide range of outlooks of the different groups within the low earning population.

Motherhood is highlighted as one of the key drivers of low earning, driving much of the gender disparity among low earners. However, low qualifications are also identified as a second risk factor for women, so that either risk factor on its own increases the likelihood of persistent low earning, with both risk factors increasing the likelihood further still.

Self-employment is highlighted as a risk factor for low earning in men, which is especially relevant given other pension saving challenges that face the self-employed, regardless of income. However, it is not identified as a risk factor for persistent low earning, with self-employed low earners being as persistent as employed low earners.

Having a partner is also shown to be a less significant risk factor for persistent low earning than the other factors identified. This may hide a wider disparity in affordability, with single low earners having greater challenges in terms of low household income, and in terms of living costs and retirement income.

It is also demonstrated that low earning among young people, especially young men, is less of an indicator of persistent low earning. This is especially relevant given that low earning is particularly common among younger workers, and that it may be less clear as to whether young people should be encouraged to save.

This research reveals insights into which low earners are most likely to be persistent, which is useful by itself, as it could inform policy intervention. It will also inform future publications in this series, which will explore the affordability of pension saving for different low earner groups.

Technical Appendix

Modelling approach

The algorithm used in this modelling approach is based on grouping responses from multiple waves of Understanding Society by age, creating distinct states at each age, and then observing how multi-wave respondents transition through these states as they age, so that probabilities of transitioning through an entire working life can be derived. It is important to note that no respondent has been in the survey for the entirety of their working life. This "roadmap" of working life should not be seen as representing the complete life histories of respondents, but rather the lives that people would be expected to live if policy, and all other variables, remained the same as they are today.

The first step of the algorithm is, for each age, to analyse all the responses from respondents who were low earners at some point (and possibly filtered by some other variable, for example, having A-levels). This means that states where they were high earners, or not earning, are still analysed, so their transitions in and out of low earning are still captured. The algorithm identifies which variables are the best predictors of future low earning, so that states are created with as much variance in expected future years as possible. To do this, the algorithm starts with the oldest age, where expected future years of low earning are either 1 or 0, and then iterates backwards.

At each age, the optimal variables to use are identified by first clustering the responses in that age group. This is done by calculating a Gower distance matrix between each response, to account for the mix of continuous, ordinal and Boolean variables in the survey. The clusters within the age group are then identified using agglomerative clustering.

Once the clusters have been identified, a decision tree is used to identify the clusters as closely as possible. A score is assigned to each solution, which takes into account the tightness of the clustering, the accuracy of the decision tree, and the deviation in expected years among states, weighted by the membership of each state. This simultaneously ensures that states are roughly equal in size and that the variables identify different low earner outlooks as well as possible.

Once the variables that determine states have been identified, the algorithm then fills in the states with all respondents, regardless of whether they were ever low earners, so that transition probabilities and state sizes represent the whole population.

This creates a transition graph which allows, for any node, to look at the expected number of future years of low earning, which is a product of transition probabilities by the future years of low earning in each subsequent state, +1 if a given subsequent state is a low earning state itself. To obtain the expected number of future years low earning for a whole age group, or all low earners at that age, a weighted average can be taken of either all states or all low earner states at that age.

Consideration must be given to sample size and weighting strategy. All UKHLS waves are used, but no BHPS waves. This is convenient as it means that the oldest survey responses used coincide with the introduction of automatic enrolment. It also ensures an adequate sample size, with each state within an age containing a sample size in the order of hundreds. It also somewhat mitigates the cohort effects that may be introduced by using older responses from the earliest waves of the BHPS. Respondents are weighted by the longitudinal weights provided by Understanding Society. This introduces a bias towards respondents from earlier waves, who are more likely to have responded in all waves up to that point. However, this is still preferable to calculating a custom weight, which may not mitigate sampling bias as accurately.

When considering variables such as health and disability, Understanding Society contains a wealth of information, and care needs to be taken to select appropriate variables. A number of variables regarding health and disability were identified as risk factors, as well as variables regarding disability related benefits. One particular variable identifies whether the respondent has a "long standing illness or disability", but much more information is available about the precise nature of the condition in question.

Lifecourses

With these risk factors identified, the next step to assessing low earner adequacy in retirement, and the impact of policy on low earners, is to determine representative life courses. It will then be possible to determine, for each model individual, what their overall pension saving ability is across their life, and where contributing to a pension may put them at financial risk in their working life.

Representative life courses are created by identifying key low earner profiles at each age. For young low earners, these could be people who are low earners for a short period at the beginning of their career; for low earners in the middle of working life, these could be mothers; and near the end of working life, these could be low earners who care for a spouse, or are self-employed. With the persistence measures identified in this research, the ages at which people transition into a state associated with low earning can be estimated, as well as the duration of low earning in this period.

The next phase of this research will examine life courses that can be identified based on these results. While persistence of low earning is one factor, it is also important to assess for these representative individuals whether they can afford to save at any particular point. For example, a representative individual may be a woman who experiences low earning after not receiving higher education qualifications and having a child. However, whether or not she should save will depend on other factors, such as overall household income. The next phase of the research will assess the affordability of saving for groups such as these.

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