

ANALYSING THE EFFECT OF JOB QUALITY ON NON- EMPLOYMENT WITH LONGITUDINAL DATA

METHODOLOGY REPORT USING
UNDERSTANDING SOCIETY, 2021-2025

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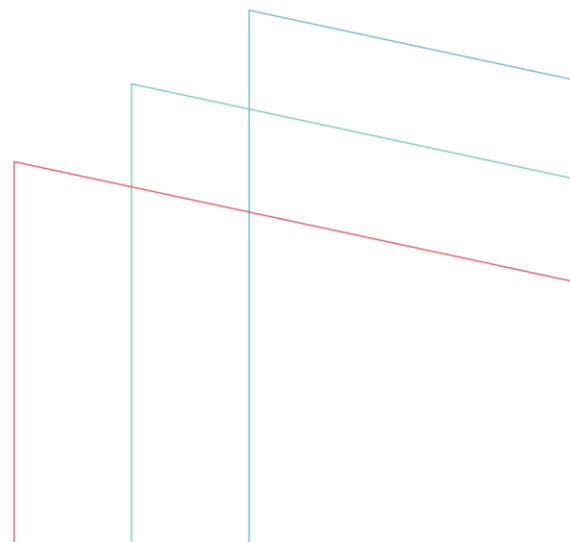
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STUDY CONTEXT AND METHODOLOGY

This methodology report accompanies our New Economics Foundation report on the effect of job quality on non-employment.¹ It provides more extensive information on the data and methodology for the quantitative elements of the report that uses longitudinal data.

It starts by outlining the nature of the study and key definitions. It then briefly discusses gaps in the literature, ending by elaborating on the regression models used to identify the effect of job quality on non-employment.

STUDY SAMPLE AND DEFINITIONS

Survey and sample

This study uses a large-scale longitudinal survey of the UK population, *Understanding Society*, covering the period 2012–2025. The actual size of the sample varies from 20,000 to 33,000 people, depending on the model used (Table 1).

The report restricts analysis exclusively to workers below the state pension age when surveyed.² Within this population, it focuses on three distinct measures of non-employment. These measures exclude those who are in full-time education or training. As they are not available ready-made within *Understanding Society*, extensive work was needed to replicate them so that they align with the way they are constructed in official UK labour market statistics (eg in the *Labour Force Survey*):

- **“ILO” unemployed:** Either not in paid work, but actively seeking work over the last four weeks and available to start work within the next two weeks; or waiting to start a job they have already found within the next two weeks. This is the UK’s official measure of unemployment, and is aligned with the International Labour Organisation’s (ILO) recommended approach to measuring unemployment.
- **“Partially inactive” (or “want work inactive”):** Not in paid work and would like a regular paid job but only meeting some, and not all, of the work search or work availability criteria for ILO unemployed. Some, such as the Trades Union Congress (TUC), have historically called for official measures of unemployment to be revised to incorporate these inactive and the ILO unemployed, into a broader “want work rate.”³
- **“Fully inactive”, non-retired:** Not in paid work, and meeting none of the criteria to be in the previous two categories. In this report, this measure also excludes

those who report retirement or full-time education or training as their main economic activity, and those above state pension age.

In most cases, analysis was done using a binary variable combining all three outcomes, but this was adapted in some cases to conduct more in-depth descriptive analysis on all three measures of non-employment. There are well-justified reasons for going beyond the ILO measure of unemployment when measuring non-employment. There is evidence the ILO measure has historically understated the impact of large-scale labour market shocks, such as the mass structural unemployment caused by deindustrialisation in the 1980s.^{4,5,6} At a more macroeconomic level, there is also evidence that increased levels of insecure and non-standard employment have broken the traditional link between the ILO unemployment rate and inflation in the UK and the United States.⁷ The Covid-19 pandemic, as will be seen, led to a major shift into other forms of non-employment other than ILO unemployed.

How job quality is measured

The study focuses on the relationship between paid workers' job quality and subsequent non-employment outcomes. Unlike previous studies, it isolates the effect of job quality on workers' later outcomes, controlling for other factors such as individual characteristics. To study this, we need a measure of job quality, measured at the individual level and drawn from the same survey.

As already discussed in the main report, we measured the job quality of the sample of workers using a composite UK Quality of Work (QoW) index, previously developed using *Understanding Society*.^{8,9} Exclusively for this report, we updated this index to include a broader range of indicators than in previous studies, and used more granular information on earners and pension receipts of workers and their families. The dimensions used in the index are closely aligned to well-established indices in existing job quality literature,^{10,11,12} but also involve some innovations in the development of the earnings, pension, job prospects, and health and safety indicators.

Figure 1 shows the indicators, dimensions, and weights of the QoW index. Twenty indicators are grouped into six dimensions, as follows:

- **Earnings quality.** This captures how workers' take-home pay compares with the minimum income standards (earnings sufficiency); how their gross hourly wages sit within the wage distribution (earnings equity); and whether they are contributing to a personal pension or, if over 60 and not contributing, receiving an adequate pension income.

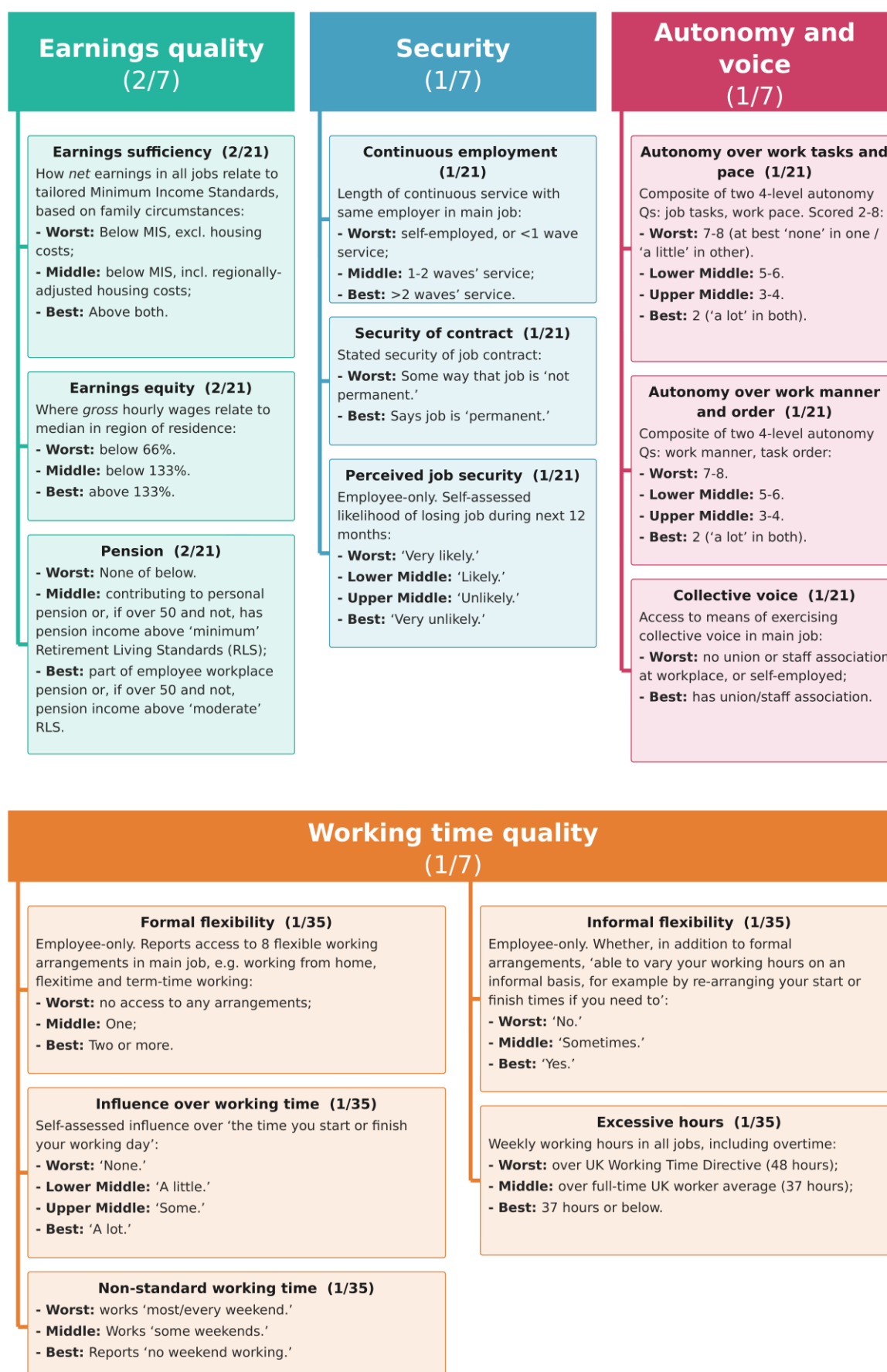
- **Security.** This measures workers' job security. It comprises three indicators, measuring whether they worked continuously enough with the same employer to accrue associated rights at work, eg against unfair dismissal (continuous employment)¹³; whether they are in a permanent or temporary job (security of contract); and their self-assessed risk of losing their job over the next year (perceived job security).
- **Autonomy and voice.** This captures the ability workers have to shape their working environment, and the manner in which they can go about their work. It is captured using measures of workers' self-assessed autonomy over the nature and pace of their tasks (autonomy over work tasks and pace) and the manner and ordering of their work (autonomy over work manner and order); and whether there is a union or staff association in their workplace (collective voice).
- **Working time quality.** This captures the availability of formal (formal flexibility) and informal (informal flexibility) flexible working arrangements in their workplace, such as varying working times or working from home; workers' self-assessed influence over the time they start or finish their working day (influence over working time); whether their hours of work exceed the UK working time directive or the average for full-time workers (excessive hours); and the extent to which their job involves unsociable weekend working (non-standard working time).
- **Prospects.** This captures the prospects workers have for advancement within their jobs, or within the occupation in which they operate. It is captured using measures of whether they have managerial responsibilities in their current job (managerial duties); their expectations of training, advancement within their job or a better job or business prospect within the next year (short-term prospects); and whether they work in an occupation with good long-term occupational growth prospects, given their qualification.
- **Health and safety.** This captures workers' day-to-day exposure to health and safety risks within their workplace. It is estimated based on the workers' industry of employment in their main job, using Health and Safety Executive data on reported work fatalities by industry (work fatalities); and using Labour Force Survey data on self-reported work accidents (work accidents) and illnesses (work illnesses) by industrial classification.

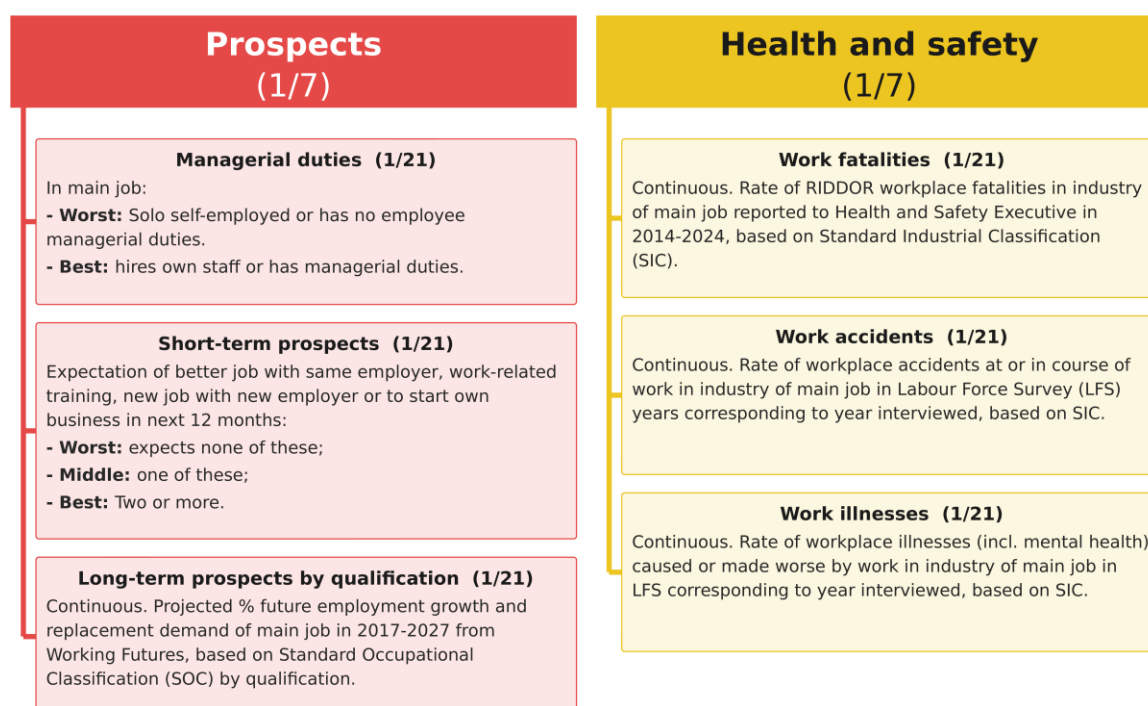
Workers' QoW index scores are simply the weighted sum of their scores on all these indicators and dimensions. The index defaults to an approach of double-weighting the earnings dimension and equally weighting all other dimensions. Within each dimension, each indicator is weighted equally. There are long-standing controversies

over the weights to assign different indicators and dimensions. To guard against this, we used more granular analysis at the indicator level and even at the level of the questionnaires, which make up the indicators for the autonomy and flexibility indicators (Chapter 3).

The QoW index measures workers' job quality in every even-numbered wave of *Understanding Society*, comprising Wave 4 (workers surveyed between January 2012 and May 2014), 6 (2014–16), 8 (2016–18), 10 (2018–20), 12 (2020–22), and 14 (2022–24).¹⁴ We could only generate the index for even-numbered waves because some of the bespoke job-quality-specific questions are not asked in odd-numbered waves. Crucially, as will be shown, this data structure still enables an understanding of the effect of job quality in the wave where they have job quality scores on their subsequent labour market outcomes in subsequent waves.

Figure 1. Indicators, dimensions and weights of the updated UK Quality of Work index.





WHERE THIS STUDY FITS INTO EXISTING LITERATURE

Over the past decade in the UK, there has been quite a lot of research on non-work and job quality. Much of this has used data from the same survey used in this report. However, with some exceptions, very few studies have looked in depth at the effect job quality plays in this picture.

Most are focused on whether ill health explains the likelihood of transitioning into inactivity, rather than the role of job quality itself. Those that did discuss job quality tended not to try to estimate a causal effect, of the kind undertaken in this report.

To provide a brief overview of existing research on this topic:

- A study published with the Joseph Rowntree Foundation (JRF) looked at the role of health transitions, and the interacting role of skills, in explaining transitions out of work or into part-time work.¹⁵ It did not look into job quality.
- A more recent National Institute for Economic and Social Research (NIESR) study, also with the Department for Work and Pensions (DWP), looked at relationship between job quality and inactivity in more depth, but only used a few select measures of job quality: employment status (PT vs FT), skill (high vs low) and employer size and wage (low vs high).¹⁶
- DWP research into disability employment focused on how employment, under-employment, low pay, part-time work, occupational skill level, zero-hours contract use, career prospects, and employee involvement differed between

people with and without disabilities.¹⁷ This is aligned with the job quality indicators developed in an earlier Office for National Statistics (ONS) study into job quality, which more broadly used a relatively narrow range of job quality indicators – just five.¹⁸ It did not look at other measures of job quality discussed in the literature, particularly worker-oriented flexibility and autonomy.

- The most comprehensive research on this to date was carried out by the Work Foundation. This study, also using Understanding Society, explored the association between the sector worked in, workers' control over their environment, autonomy, and access to flexible work arrangements on the likelihood of falling into unemployment, inactivity, or early retirement due to ill health.¹⁹ It found that workers with access to flexible work arrangements, control over their work, and/or autonomy are less likely to fall out of work in the event of ill health; and that workers in sectors more exposed to insecure work are more likely to experience a transition into inactivity due to ill health. In a separate analysis using the same survey, they also found insecure workers are 1.4 times more likely to experience involuntary spells out of work than those in secure jobs.²⁰
- The Health Foundation regularly updates a set of indicators from Understanding Society on the health outcomes of workers broken down by key job quality indicators including job satisfaction, pay, job security, and overall subjective wellbeing. But the data is descriptive and is not intended to be causal.²¹
- There has also been some welcome in-depth study into what constellations of job characteristics create healthy jobs, but this research has tended not to be quantitative or using representative surveys.^{22,23,24} Stronger quasi-causal evidence could help reinforce these findings, and also help understand its interaction with, for example, ill health or non-standard employment.

This report builds on this research in three key ways.

First, the focus is how job quality specifically can support sustainable employment. This contrasts with many other studies, where the main focus has often been on ill health. In this study, we are interested in the intersection of ill health, but an episode of ill health is not necessary for job quality to still have an effect on workers' employment outcomes.

Second, this report uses a larger and more varied range of job quality indicators than previous studies. As mentioned above, 20 indicators are grouped into six dimensions, and analysed in three ways:

- Measuring workers' overall job quality, using workers' QoW index scores. Later in the analysis, they are split into quintiles based on their QoW index scores.

- Analysis using each indicator²⁵ separately.
- For workers in different employment relationships. we focus particularly on those who are self-employed in their main job and employees on zero-hours contracts.

Third, quasi-causal analysis is attempted, using a range of models, to understand the effect of job quality on the likelihood of exit into non-employment. Previous analysis has tended to analyse the relationship using a repeated cross-sectional approach, looking at transitions between pairs of waves and controlling for observed characteristics. This report improves on these, taking advantage of the longitudinal nature of the survey used.

THE MODELS USED IN THIS STUDY

To isolate the effects of job quality on labour market outcomes, we present three sets of regression models. These are done on different cuts of the longitudinal data from *Understanding Society* (hence the sample size varies depending on the model):

- Model 1 is the simplest model. It is a between-worker comparison which investigates the effect of job quality in the wave immediately prior (Wave T) on the likelihood of exit into non-employment in the wave immediately after (Wave T+1). It is not longitudinal, but instead uses a pooled cross-section comprising workers in waves 4 to 15 of the sample, in five pairs (Waves 4 → 5; 6 → 7; 8 → 9; 10 → 11; 12 → 13; 14 → 15). This has the largest sample size, as respondents need only to have responded in both waves in a given pair to be included in the analysis. It is restricted to those in work in the first wave of each pair (Wave T) and who report an economic activity outcome in the wave immediately after (Wave T+1).
- Model 2 develops Model 1 using workers who appear in multiple waves (two or more even-numbered waves) to improve accuracy. While its focus is still on between-worker comparisons, it controls for more characteristics by following the same workers over time and controlling for time trends.
- Models 3a and 3b narrow the focus to workers in more than two waves. They make stronger causal claims using two different model specifications. Unlike the previous approaches, the focus here shifts towards exploring the effect of different levels of job quality on the likelihood of subsequent exit within individuals, rather than by making comparisons between individuals:
 - A fixed effects specification which accounts for time-invariant unobservable confounding variables.

- A first-difference model specification that analyses the effect of changes in job quality on changes in inactivity. This allows for the strongest causal claims.

As each model has both advantages and limitations, all three are used in this study, rather than making a claim as to one “best” model. Indeed, there are several inherent challenges with job quality that make causal estimates especially challenging for a study of this topic. The next three subsections describe these models in more detail.

Model 1: Logistic regression (paired waves)

Model 1, the paired-waves logistic regression design, compares individuals across the sample. It looks at whether different levels of job quality between those who experience a transition into non-work in the subsequent wave vs those who do not are significant in explaining the likelihood of a transition, even after controlling for some important differences between these two groups.²⁶

It is the weakest of the three models presented. Causal claims for this model should be avoided: even with controls, it is unlikely to be able to account for non-observable confounding characteristics of workers in lower vs higher quality jobs, due to issues of people self-selecting into better-quality jobs. Its use in this report is broadly similar to the previously mentioned NIESR study into work and health transitions, which also uses *Understanding Society*, and conducted similar analysis on a pooled cross-section of the sample.²⁷

Model 2: Linear probability model using QoW quintiles (longitudinal panel)

Model 2 uses the longitudinal panel rather than the paired-waves pooled cross-section. This therefore accounts for repeated observations of the same worker, improving precision and addressing some limitations of the previous model by controlling for more observed characteristics to identify a causal effect. It does this, first, by introducing wave fixed effects to control for aggregate time trends; and second, by accounting for individual worker characteristics to account for the non-independence of repeated observations of the same worker over multiple waves.

To do this, it compares the likelihood of exit into non-employment of a worker, but it does so using a Linear Probability Model (LPM) rather than a logistic regression. It converts workers’ QoW index scores into quintiles, with Q1 being workers in the lowest-quality 20% of jobs and Q5 being the highest-quality 20%. The LPM predicts the

difference in probability of non-employment occurring for a movement from Q1 to Q4 of the QoW quintile distribution up to Q5 (best job quality).²⁸

Its use in this study is partly inspired by Binder and Freytag's²⁹ study, which also uses *Understanding Society*. It looks into the effect of volunteering on subjective wellbeing; they critique the use of more causal model specifications such as those used in Models 3a and 3b and instead favour a matching approach by comparing groups of otherwise similar people across multiple waves of the survey. However, we adopt a different approach than them to comparing workers due to the rather different nature of job quality, meaning a matching approach isn't nearly as easy to construct for job quality as it is for, for example, a binary volunteering outcome.

Models 3a and 3b: Fixed effects and first-differencing (longitudinal panel)

The final pair of models comes closest to making quasi-causal statements about how high-quality work, in itself and independent of other characteristics, could protect workers from falling out of work.

Model 3a is a within-individual fixed effects specification. It is similar to Model 1, but with an important addition to control for even unobservable characteristics that don't vary over time (eg ability, baseline preferences). Since this doesn't absorb confounding over the same time, controls for variables which are still likely to change over time are retained (eg number of children, caring duties, health).³⁰

This model tests, within the same individuals, whether higher job quality at a given time is associated with a different probability of exit from the labour market – comparing the same person at different levels of job quality.

Model 3b is a first-difference model. This is similar to the fixed-effects specification, but compares changes in job quality and other variables to changes in labour market exit probability for the same person.³¹

This model controls for everything in Model 3a, and controls for *trends* that change at a constant rate. It also measures job quality differently; it tells us whether an improvement or deterioration in job quality (compared to the previous wave) is associated with an increase or decrease in probability of falling into non-employment.

These are the most causal models, and their use in this report is closely aligned with another study in the literature.³² However, they also carry a risk of going in the opposite direction and underestimating the beneficial effect of high-quality work by only capturing the effects of changes in job quality within the same individuals. They also

over-control for any variables which change slowly. In addition, there are inherent challenges in using this for job quality indicators compared with, for example, volunteering, because of the relative lack of within-individual variation for the former (for descriptive information on the changes in each indicator within individuals, refer to Table A1).

IS LOWER JOB QUALITY ASSOCIATED WITH HIGHER NON-EMPLOYMENT EXIT?

OVERVIEW AND DEFINITIONS

This chapter explores the general relationship between job quality, measured using the Quality of Work (QoW) index, and the likelihood of falling into non-employment. It starts by describing how the relationship has changed over time using the survey, but then discusses the model-based findings to supplement the discussion in the main report.

THE RELATIONSHIP BETWEEN JOB QUALITY AND LATER NON-EMPLOYMENT

Figure 2 describes the changing rates of exit by workers' positions on the QoW quintile distribution using the paired-waves pooled cross-section of the data. A range of supplementary tables in the appendix reinforce these findings (Figures A1–A3).

The figures show that workers in the lowest-quality jobs are consistently more likely to exit into non-employment than workers in the highest-quality jobs. The main report discusses the differences in likelihood of exit using this descriptive data. Across each wave pairing, those in the lowest-quality 20% of jobs are 1.6 to 3.37 times more likely to exit employment in the subsequent wave than those in the highest-quality jobs. There is no consistent upward or downward trend in this ratio across the time series (Figure A3).

The pandemic has also led to a marked change in rates of labour market exit among all workers over the past decade, with exits into non-employment increasingly likely to take the form of 'full inactivity' as the time series goes on. This trend is particularly pronounced for those in the lowest-quality jobs: those in the bottom 40% of the QoW distribution were no more likely to exit into 'full inactivity' at the start of the time series than they were into ILO Unemployed or Partial Inactivity, but the pandemic markedly changed this relationship and led to a major shift into Full Inactivity.

It should be noted that there is a divergence between what *Understanding Society* and the *Labour Force Survey* (LFS) say about pre-pandemic trends in inactivity. There are well-documented differences in what the two surveys reported about trends in ill health before the pandemic, with the LFS not showing a pre-pandemic rise and *Understanding Society* reporting one.^{33,34} The findings in this report also suggest the same could be said about inactivity. There is no conclusive answer to which trend is correct.

Figure 2. Exit rates into three forms of non-work at Wave T+1 by QoW quintile of worker in Wave T. Sample grouped by pairs of waves in *Understanding Society*. Only those in paid employment in Wave T are included.

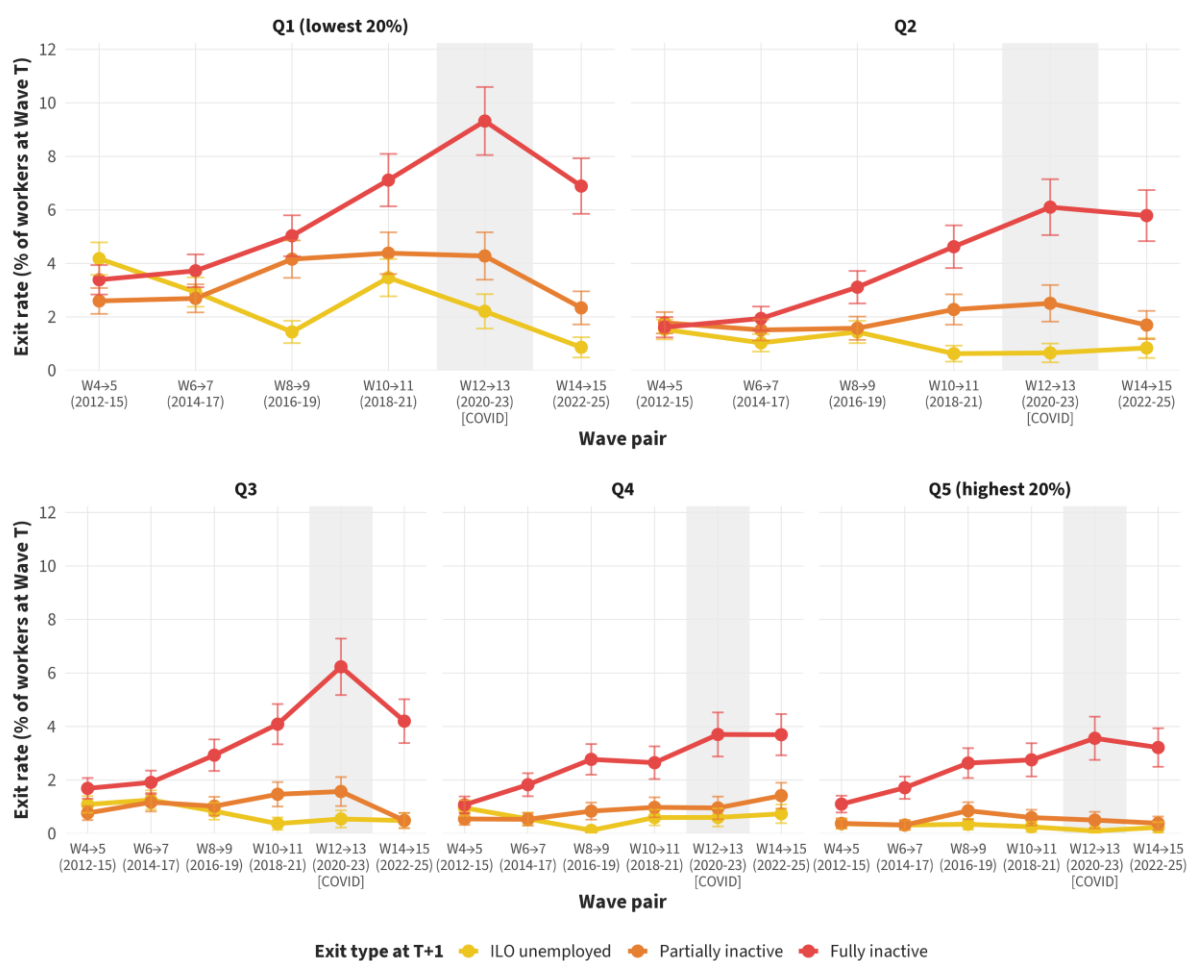
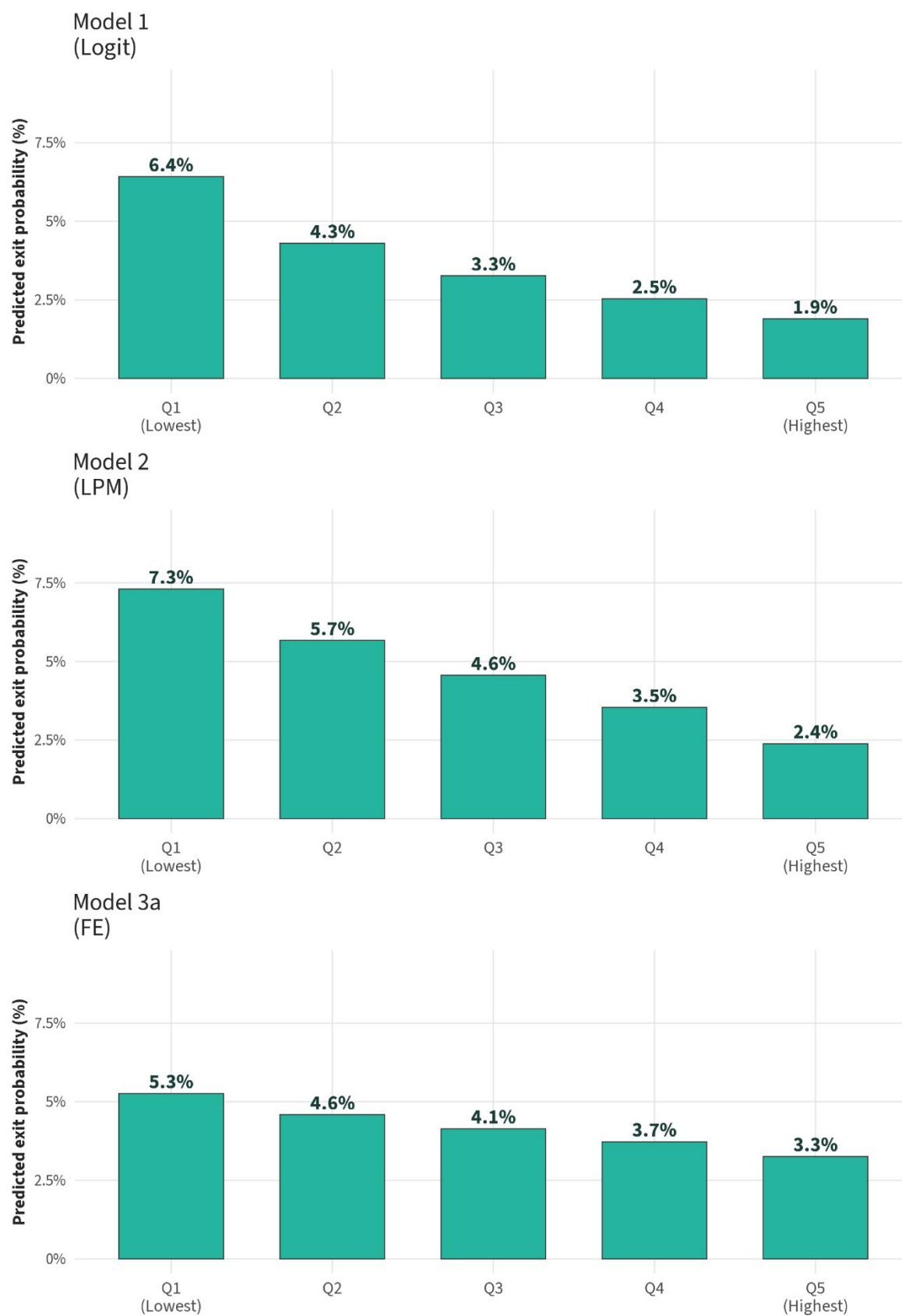


Table 1. Effect of QoW index scores on likelihood of exiting into non-employment – summary of all four model results.³⁵

Model specification	Coefficient ^{xxxvi} (std. error)	Effect size	Number of observations
1: Paired waves logit	-0.02913*** (002388)	+1.338 higher odds of exit from 10% decrease in QOW	33,798
2: Quintile comparison (Q1 vs Q5)	0.052046*** (003166)	+5.2% higher exit rate (Q1 vs Q5)	30,065
3a: Individual fixed effects	-0.00046*** (000108)	+0.46% exit rate from 10% decrease in QOW.	30,065
3b: First-difference	-0.00039*** (0.000095)	+0.39% exit rate from 10% decrease in QoW.	20,356

Figure 3. Model-based predicted exit probability for a hypothetical worker with job quality in the mid-point of each QoW quintile, for Models 1, 2 and 3a.



Part of the difference is explained by a notable limitation of *Understanding Society* data. As a longitudinal survey by design, the sample, all else held equal, will lead to a different pattern of exit as samples age. However, the trends observed here are too sharp to be explained through that alone. Conversely, there have been major issues with LFS representativeness and accuracy over the same period covered by this report.

Whichever data is used, however, a major shift in labour market exit towards inactivity has been observable since the pandemic; the debate is over whether any aspects of this shift were observable before the pandemic. This report adds crucial new evidence on the intersecting role of underlying job quality in this picture and shows that those in lower-quality jobs experienced markedly different rates of exit and a rather different pattern of exits.

DOES LOWER JOB QUALITY PREDICT A HIGHER LIKELIHOOD OF EXIT?

The previous subsection described how the pattern of exit into non-employment differs depending on workers' job quality. This subsection discusses whether workers' job quality in itself may play a role in this difference. Table 1 provides the effect sizes of the three models discussed in the previous methodology chapter. Overall, all of the models support the finding of a quasi-causal association between higher job quality and a lower likelihood of subsequently progressing into non-employment.

The analysis from Model 1 finds higher job quality overall is strongly associated with a lower likelihood of onset into non-employment. Model 2 reports similar effect sizes to Model 1, albeit using a rather different model specification, thus providing further support for the findings in Model 1.

The size of the effect diminishes significantly in the within-individual models (Models 3a and 3b), but remains statistically significant. Notably, the consistency between FE and FD results suggests that both the level of job quality relative to an individual's own average (FE) and changes in job quality from one wave to the next (FD) predict exit probability in the same direction and with similar magnitudes. This strengthens the potential causal interpretation.

This difference in effects between Models 1 and 2 on the one hand, and 3 on the other, can be interpreted in various ways. It could be that Models 1 and 2, due to their between-individuals comparison, are not sufficiently accounting for the full range of confounding variables: in other words, even once controls are introduced, there are still marked differences in wider labour market prospects between individuals in higher- vs lower-quality jobs. On the other, as discussed in the previous subsection, it could reflect

that Models 3a and 3b over-control by restricting analysis within-individuals, and only capture a rather unusual group of workers (those represented in multiple waves, who experience changes in QoW).

Figure 3 translates the findings of Model 1, 2, and 3a into a more intelligible set of percentages. It shows the predicted difference in exit rates for a hypothetical worker in the midpoint of each quintile in the QoW distribution, after controlling for covariates and other characteristics. It shows that across all three sets of models, lower-quality work has an effect on the likelihood of exit into non-employment:

- Model 1 predicts that being in the lowest-quality 20% of jobs is associated with a 3.37 times higher exit risk, once confounding characteristics are accounted for. As a reminder: this only controls for observable confounding characteristics between individuals.
- Model 2 makes a similar prediction via a different route, and finds the lowest-quality work is associated with a 3.04 times higher exit risk.
- Model 3a predicts a 1.6 times higher exit risk. As a reminder, this is based on a within-individual comparison, and can control for unobservable time-invariant confounding characteristics.

IDENTIFYING ‘HEALTHY JOBS’: WHAT INDICATORS DRIVE THE DIFFERENCES?

OVERVIEW AND DEFINITIONS

The key finding in the previous chapter was that whichever model specification or cut of the data adopted, overall job quality is potentially causally associated with a lower risk of non-employment – both between individuals (Models 1 and 2) and when following the same individuals over time (Models 3a and 3b). However, the precise drivers and mechanisms of this relationship remain underexplored.

This chapter takes this general finding forward by identifying which job characteristics are particularly strongly associated with lower risk of non-employment. It identifies a specific constellation of job characteristics which may be particularly protective for workers, to build on existing literature on healthy jobs.^{36,37,38}

It should be stressed that there is no expectation of a consistent positive relationship for all Quality of Work (QoW) indicators. There are many valid reasons why job quality matters for workers, regardless of whether it is associated with a higher or lower risk of exit into non-employment. As such, it is expected that only a subset of indicators of the QoW index will drive this relationship. Limitations in the data and the inappropriateness of certain model specifications for certain job quality indicators are other important considerations: some job quality indicators are less well-suited to this analysis than others.

WHICH JOB QUALITY INDICATORS ARE MOST IMPORTANT?

We start by running the same three sets of models, and on the same cuts of the *Understanding Society* data, separately on each indicator of the UK QoW index. This is essentially the same model specifications outlined previously, but substituting the overall job quality index score for workers’ scores on each of the 20 index indicators.³⁹

This also helps avoid criticisms that the findings in the previous chapter may be overly sensitive to the weights assigned to each indicator or dimension of the index.

Table 2 provides an overview of the significance of the effects for each indicator, and the significance of the associations, across the models run. The analysis identifies a strong or consistent association for six indicators in the QoW index – including one earnings indicator, all three security indicators and two of the three Autonomy and Voice indicators.

Table 2. Summary of model results on individual job quality indicators. Ticks denote when indicator found to be protective. Asterisks denote statistical significance. Colour coded by number of models protective: dark green = three or more; light green = two; no colour = fewer than two.⁴⁰

Indicator	Model 1 (pooled cross-section)	Model 2 (longitudinal LPM)	Model 3a (FE)	Model 3b (FD)	N models protective
D1: Earnings quality					
Earnings sufficiency	√***	√***	---	---	2 of 4
Earnings equity	√***	√***	---	---	2 of 4
Pension	√***	√***	√*	√*	4 of 4
D2: Security					
Continuous employment	√***	√***	---	√*	3 of 4
Security of contract	√***	√***	√***	√***	4 of 4
Perceived job security	√***	√***	√***	√***	4 of 4
D3: Autonomy and voice					
Autonomy over work tasks and pace	√**	---	√**	---	2 of 4
Autonomy over work manner and order	√*	√**	√*	---	3 of 4
Collective voice	√***	√***	---	√*	3 of 4
D4: Working time quality					
Formal flexibility	√***	√***	---	---	2 of 4
Informal flexibility	√**	√**	---	---	2 of 4
Excessive hours	---	---	---	---	0 of 4
Working hours influence	---	---	---	---	0 of 4
Non-standard workdays	---	---	---	---	0 of 4
D5: Prospects					
Managerial duties	√***	√***	---	---	2 of 4
Short-term prospects	---	---	√***	---	1 of 4

A further seven indicators are found to be protective in two of the four models. In most cases, they are significantly protective in the between-individuals comparisons, but not within-individual comparisons. Mirroring the discussion in the preceding subsection, this can be interpreted in one of two ways. A more pessimistic interpretation is that the 'protective' effect of these indicators is explained entirely by workers with a lower

likelihood of exit self-sorting into these jobs anyway. This may be the case for the flexibility indicators, since these may tend to be accessed by workers who are already in advantageous positions in the labour market. A more optimistic interpretation is that FD/FE methods cannot capture these factors, due to low rates of within-individual change in many of these indicators (Table A1).

THE ROLE OF JOB SECURITY AND AUTONOMY – FURTHER DISCUSSION

The precise causal mechanisms driving these changes deserve some further discussion and certainly warrant more in-depth investigation in further studies. The findings in the previous subsection point to a particularly strong association for the job security indicators. However, these strong associations may reflect an effect of working conditions on the likelihood of exit, or they may reflect a decline in working conditions in anticipation of exit, rather than anything strictly associated with job quality. This is especially likely for the Perceived Job Security indicator, since a change in self-assessed likelihood of exit may, for example, reflect a change in wider labour market conditions, which the worker then correctly anticipates will lead to them losing their jobs.

This is, however, less likely for the Security of Contract indicator. Indeed, the relatively low rates of within-individual change in this indicator would tend to push down the effect sizes in Models 3a and 3b, so the continued significance of this in all specifications is particularly striking. Similar to Perceived Job Security, it may reflect a change in working conditions in anticipation of exit – such as moving to a less secure job in advance of a pre-planned exit. This seems less likely for this particular indicator, though, given workers in permanent jobs are likely to want to retain these protections if possible. A more plausible confounding explanation would be that workers at the bottom end of the labour market are likely to be forced between permanent and temporary jobs due to precarious wider labour market conditions, and that a decline in their job security followed by labour market exit would then be reflected in the FE/FD models. In this case, however, this would serve to reinforce rather than undermine the general findings and recommendations of the report. Regardless of the causal mechanisms, it points to a need to address underlying job security and precarity issues at the bottom end of the labour market, to support continuous and sustained employment.

The results also point to autonomy playing a particularly important role in helping workers retain employment. The twin autonomy indicators of the QoW index are a composite of four questions of workers' self-assessed ability to shape their working environment. There is also an additional fifth autonomy question which asks workers

about their autonomy over their working hours, used here to construct the separate Control over Working Hours indicator of the Working Time Quality dimension.⁴¹ Table 3 shows the effect sizes for all five of these specific autonomy indicators using Model 1, 2, and 3a.

They show strong and consistent associations for two of the four autonomy indicators – job tasks and task order – and a partial association for work pace. There is no evidence of an association with the work hours measure in any model. Overall, these findings suggest that the ability to control the means and way through which they work may have an important effect on a worker's ability to retain their job. This effect is significant in both the between-individual and within-individual models.

The direction and specific mechanisms of causality here deserve further discussion. Recent cross-country evidence using longitudinal data suggests workers' assessed autonomy declines after around age 40,⁴² so the findings here may reflect another aspect of this understudied life-course trend. In addition, similarly to the job security dimension, they may reflect a decline in autonomy in anticipation of exit: for example, a tightening of managerial controls due to either a decline in individual performance or a worsening business environment, then leading to exit. These need further study.

Table 3. Effect of each of the five autonomy variables on likelihood of employment exit for Models 1, 2 and 3a.⁴³

Autonomy variable	QoW composite indicator	Model 1 Pooled logit (cross-sectional)		Model 2 Longitudinal LPM (between-person)		Model 3a Individual FE (within-person)	
		Protective?	Coeff.	Protective?	Coeff.	Protective?	Coeff.
Autonomy over job tasks	Autonomy over work tasks and pace	√***	+0.1197	√**	+0.00223	√*	+0.00324
Autonomy over work pace		√***	+0.0999	–	+0.00120	√*	+0.00226
Autonomy over work manner	Autonomy over work manner and order	√**	+0.0854	–	+0.00190	–	+0.00199
Autonomy over task order		√***	+0.1301	√***	+0.00448	√**	+0.00441
Autonomy over work hours	Control over working hours	–	+0.0114	–	-0.00186	–	-0.00109

WORKERS IN PRECARIOUS JOBS

OVERVIEW AND DEFINITIONS

This chapter focuses specifically on the findings for two groups of workers in non-standard, and generally more precarious, forms of employment: the self-employed, and employees on zero-hours contracts.

The findings in this chapter focus on descriptive analysis. It supplements the findings in the main report and largely carries forward the discussion in the first part of Chapter 2, focusing particularly on Covid-related trends

CHANGES IN SELF-EMPLOYED EXITS – SUPPLEMENTARY INFORMATION

For the self-employed, we undertook a model-based analysis for each Quality of Work (QoW) index indicator to explore whether the combination of being self-employed *and* scoring poorly on QoW indicators had an additional negative effect on non-employment exit, as an interaction term. We found only one indicator (Managerial Duties) to have a significant interaction with self-employment status, and be significant across Models 1–3. No clear or consistent interaction was found with the other QoW indicators.

Figure 4 tracks rates of exit into the three forms of non-work for the self-employed vs employees across the six pairs of waves used in the pooled cross-section cut of *Understanding Society* data. As discussed in the main report, this finds the rates of exit for the self-employed were similar to employees in earlier waves, but that the rate of exit into inactivity rose considerably higher for the self-employed in the waves leading up to and including the Covid-19 pandemic.

Further analysis suggests that this does not reflect a rise in voluntary inactivity such as early retirement: only a small minority of self-employed falling into inactivity report later drawing down on an employee or personal pension (Figure 5). In any event, the analysis in this report is restricted to those below state pension age, and excludes even those who are inactive below state pension age who report retirement or full-time education as their main economic activity.

This may reflect some distinct features of the employment relationship for self-employed workers, as compared to employees. Where a worker in a self-employed employment relationship experiences a labour market shock and/or falls into ill health, they lack many of the support mechanisms available to workers in standard employment relationships. For employees, the employer is legally obliged to continue

employing them, and to some degree has an incentive to support them when managing a health condition due to the deadweight costs associated with losing them and hiring another worker. Even in cases where this employment is redundant during the pandemic, government support schemes such as furlough existed to retain these workers in employment. Overall, their support is therefore generally better than many self-employed workers, even if there are concerns about the sufficiency of, for example, statutory sick pay provisions.⁴⁴

These same protections do not exist for the self-employed. Outside the context of a shock, they are unlikely to face significantly different risks when compared with employees – as suggested in the pre-Covid labour market transitions data. When faced with a shock, they absorb most of the risk associated with this shock themselves: without employment protections, they may simply cease to trade during the course of a shock – whether for economic reasons (because their trade is no longer viable during the pandemic), health reasons (because they fall ill), or both. The lack of social protections for these workers and the lack of employer obligations exacerbate this risk.

Further research is needed to explore this in more detail. In particular, it is not known from this data whether, and to what extent, these self-employed workers were able to draw from Covid-related support schemes. Nevertheless, the findings in themselves should be a cause for alarm for policymakers; the focus of most policymakers' efforts to improve in-work support for those with health risks is on employees in standard employment relationships.⁴⁵

By contrast, there is little discussion of the more complex challenge: how to support those in non-standard arrangements. This is problematic, since – in common with many other countries – a large part of the rise in employment achieved by the UK in the years since the pandemic was in non-standard arrangements such as dependent self-employment.⁴⁶

It is challenging to directly compare these trends with other datasets, but the *Labour Force Survey* (LFS) paints a very similar picture of the Covid-related trends, using exclusively cross-sectional published data:

- LFS data⁴⁷ suggests the number of self-employed peaked at 4.693 million in Q4 2019, before dropping sharply to 4.113 million in Q4 2021 – a 12.4% fall.
- This report's analysis also suggests nearly one in eight (12.1%) self-employed people exited into non-employment in the pandemic period (2020–23).

Our analysis suggests that for self-employed workers, the pandemic period saw a disproportionately high exit out of work for those in the worst-quality jobs: almost four

in ten (39%) exits during 2020–23 were from the lowest-quality fifth of self-employed jobs – 1.5 times higher than in 2018–21, and the highest exit rate across the whole study period (Figure A4).

Figure 4. Proportion of self-employed vs. employees who exited into non-employment by wave pairing.

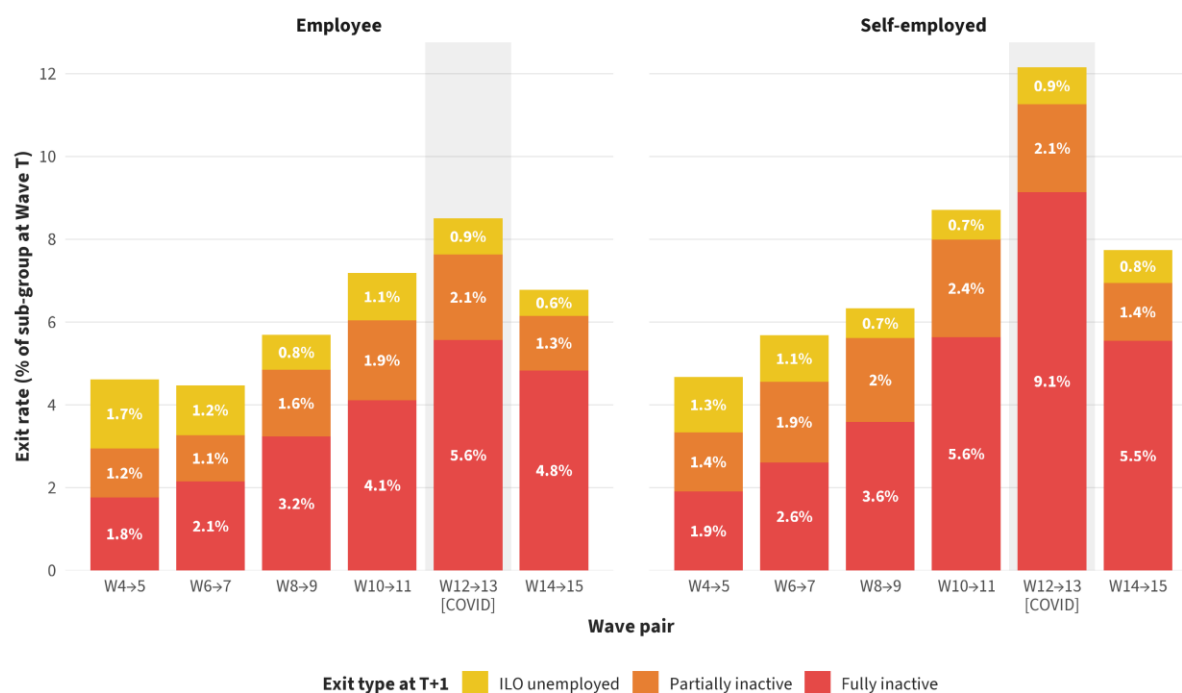
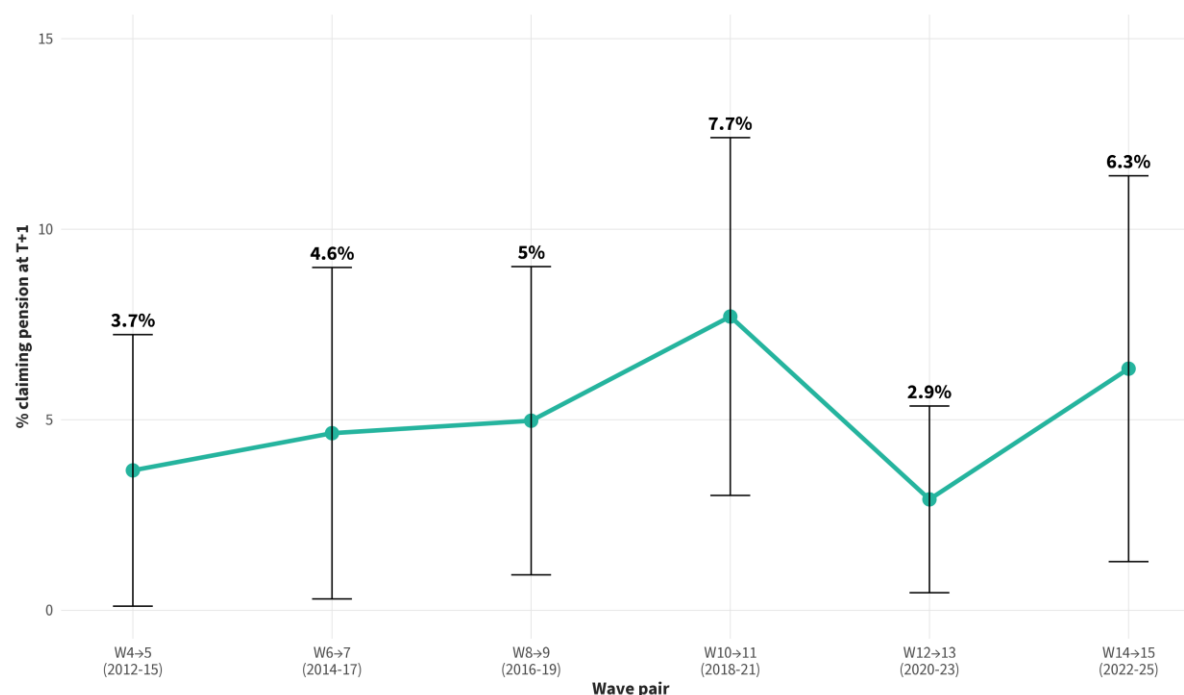


Figure 5. Employee or personal pension claiming rates for self-employed who exit the labour market in subsequent wave. The sample here is self-employed at wave T who exit to any form of non-work by wave T+1, who subsequently report receiving any kind of pension income. Error bars show a 95% confidence interval.



CHANGES IN ZERO-HOURS CONTRACTS EXITS – SUPPLEMENTARY INFORMATION

A similar analysis was attempted for the *Understanding Society* sample of employees on zero-hours contracts. In this case, low sample sizes prove a particular challenge, as far fewer respondents report using these contracts than for the self-employed sample (often in the low hundreds wave-by-wave). The problem is compounded because the survey only started to ask respondents about zero-hours contract use from Wave 8 onwards, meaning only limited pooled cross-sectional analysis can be undertaken across four wave pairings.

Notwithstanding these limitations, the findings are consistent with those for the self-employed. Figure 6 finds some potential evidence that workers on zero-hours contracts transitioned into inactivity at disproportionately higher rates than other employees⁴⁸ during the Covid-19 pandemic. In the two waves before the pandemic, exit rates for these workers were not noticeably different, but this changed markedly in the pandemic. The difference in exit in the Covid wave is statistically significant at the 0.5% confidence level ($p < 0.05$), though close to the significance threshold.

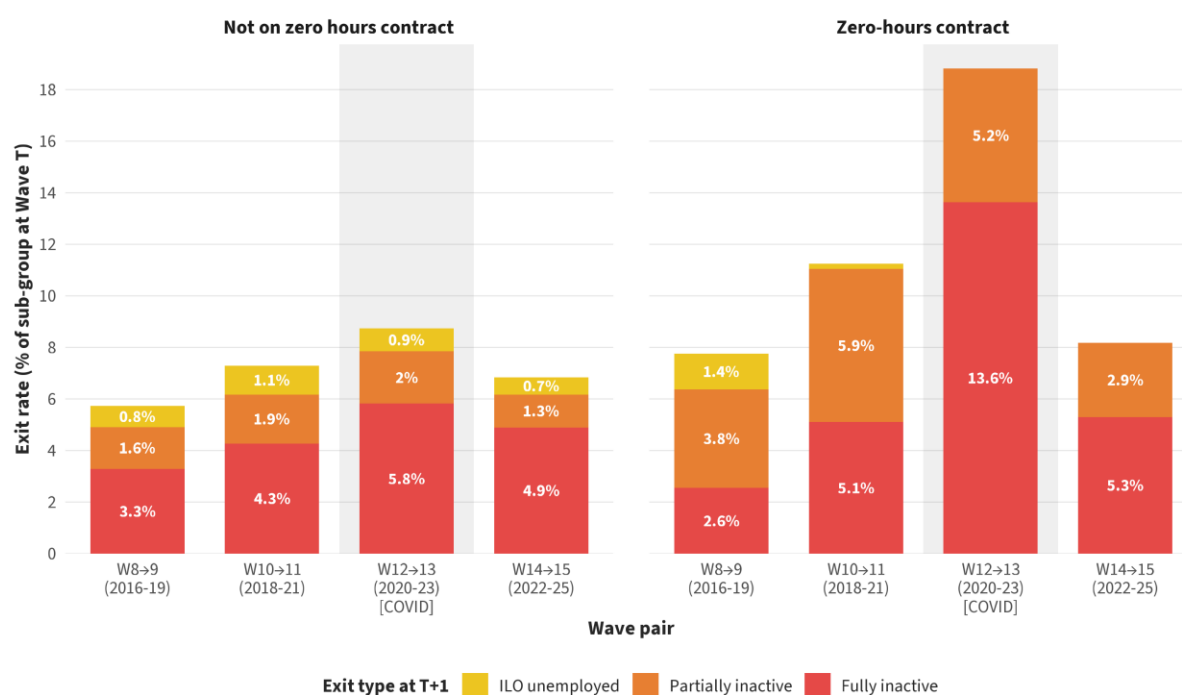
Again, direct comparison with LFS data is not easy, but to compare the two:

- According to LFS data,⁴⁹ the number of people on zero-hours contracts reached a pre-pandemic peak of 1.077 million in Apr–Jun 2020, before falling sharply to 961,000 in Jul–Sept 2020 – a 10.8% (116k) fall.
- By contrast, our analysis suggests nearly one in five (18.8%) of people on zero-hours contracts exited the labour market in the pandemic period (2020–23). This is somewhat higher than the LFS figure, and contrasts with the much closer alignment in the estimates for the self-employed.

Overall, this suggests similar factors as for the self-employed may be at play for those on zero-hours contracts. Despite ostensibly having a rather different legal relationship to their employers, in practice, they have many commonalities – particularly in terms of a precarious employment relationship with no guarantee of continued employment when faced with a shock like the pandemic.

The changes in the Employment Rights Act 2025 have the potential to dramatically improve the situation for workers on zero-hours contracts, by giving them a right to a contract with guaranteed working hours based on their working hours in a 12-week reference period. The Act will not change the employment rights for the self-employed in the same way.

Figure 6. Proportion of employees on zero-hours contracts vs rest of workforce who exited into non-employment by wave pairing.



THE INTERSECTION OF ILL HEALTH AND DISABILITY

OVERVIEW AND DEFINITIONS

This final chapter focuses on findings of Chapter 4 further, by exploring whether “healthy jobs” may be especially beneficial in protecting workers who experience a transition into ill health between waves of the survey. This is a particularly important topic of study, since evidence suggests policymakers need to be increasingly cognisant of the need for workers to increasingly manage one or often multiple health issues whilst in paid work: as discussed in the main report, evidence suggests that by the age of 48–49, half of the population will have at some point had an onset of a health condition.⁵⁰

To look into this, this chapter takes advantage of the rich range of measures of physical and mental health and disability available in *Understanding Society* – similarly to a JRF study using the same dataset.⁵¹ Three combinations of health variables are explored separately:

- **Longer-term ill health or disability.** This is a binary variable; workers who report this are prompted for whether it has affected them for at least a year.
- **Short-term mental health.** This is a battery of questions asked in a separate self-completion questionnaire, asking about whether, in the past five weeks, their mental health has affected a range of functions. I code this variable on a scale which combines all these together into a single composite score.
- **Short-term physical health.** This is a mirror image of the above variable, but for mental health.

In this chapter, the focus is specifically on workers who experience an *onset* of ill health in-between waves of the survey (Wave T → T+1), in contrast to with those whose health remains stable. Whilst there is evidence of a strong association between prior health and for example long-standing illness, with clear evidence that this is often an involuntary transition, this has already been more heavily studied.

Rather than measuring associations with workers’ QoW scores overall, this chapter uses a more focussed analysis of the twelve moderately and highly significant ‘healthy jobs’ indicators. When summing them, they are weighted according to the number of models they are significant in.

METHODOLOGY

This analysis is best suited to a within-individual fixed effects model (Model 3a), since we are interested in whether, within individuals, having a healthy job at Wave T protects them more when their health worsens at wave T+1. This is done by introducing an interaction term between ill health and the 'Healthy Jobs' composite score for Model 3a.⁵² It is not well-suited to Model 3b because this would involve analysis of the effect of changes in 'healthy jobs' scores between waves, and there is no clear reason why this would be causally associated with an interaction for an onset of ill health.

Ill health is also used a moderator for Model 2. This takes a similar form for Model 3a, but uses the panel LPM specification rather than within-individual fixed effects.⁵³ The use of ill health as a mediator is similar to another study using German panel data, although this report is able to control for more potential confounders than they are.⁵⁴

FINDINGS

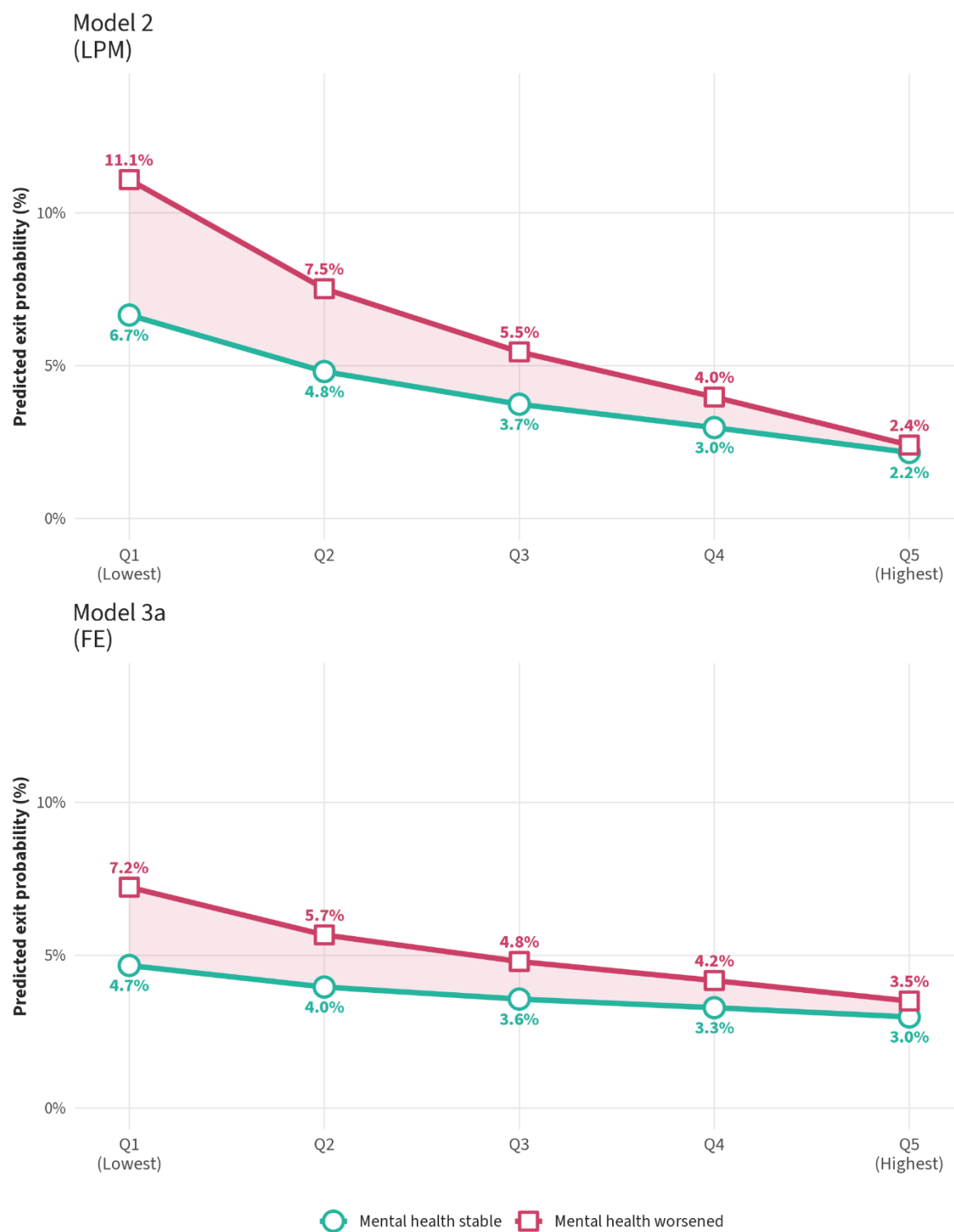
The analysis found a strong and significant association for one of the health conditions: a deterioration in mental health. There was no significant interaction for physical health or long-term illness.

Figure 7 visualises the implications of this, by contrasting the model-based percentage likelihood of exit by quintile of the 'Healthy Jobs' distribution for workers who experience a mental health transition versus those whose health remains stable.

The additional beneficial effect of 'healthy jobs' for those who experience a mental health transition is shown in the difference between these percentages, and is generally higher for those in the lowest-quality jobs. For example:

- Experiencing a deterioration in mental health whilst being in the lowest-quality jobs (bottom 20% of the 'healthy jobs' distribution) is associated with a 2.06-4.63 times greater likelihood of exit from work, compared with those in the highest-quality jobs (top 20% of 'healthy jobs') distribution.
- Being in the lowest-quality job is associated with a 1.53-1.66 times higher exit risk for workers who undergo a decline in mental health, versus someone whose mental health remains stable. This suggests that 'healthy jobs' are disproportionately more beneficial for workers who experience a mental health transition.
- In the same vein, in both models, this decline in additional exit risks reduces considerably for those in the highest quality jobs, suggesting that 'healthy jobs' are protective for these workers.

Figure 7. Model-based predicted additive effect of 'Healthy Jobs' by quintile, for workers whose mental health worsens versus those who stay stable. Models 2 and 3a.



APPENDIX

Table A.1. Change in QoW indicators used in FD/FE models across all waves.

Dimension	Indicator	Change across observations ⁵⁵ (same individuals observed multiple times)			Individual-level change % ever changed ⁵⁶
		% decreased	% unchanged	% increased	
D1: Earnings quality	Earnings equity	13.7	70.3	16	45.9
	Earnings sufficiency	12.8	76.5	10.7	36.9
	Pension	6.1	82.8	11	30.1
D2: security	Continuous employment	9.2	79.9	10.9	31.6
	Perceived job security	22.6	58.6	18.8	60.8
	Security of contract	3.9	92.5	3.6	12.6
D3: Autonomy and voice	Collective voice	7.1	86.1	6.8	23.9
	Autonomy over work manner and order	21.4	56.4	22.2	62.1
	Autonomy over work tasks and pace	24.7	50	25.3	68.9
D4: Working time quality	Excessive hours	14.8	69.5	15.7	47.3
	Formal flexibility	22	57.3	20.7	60.8
	Informal flexibility	19.1	62.5	18.4	54.2
D5: Prospects	Non-standard working days	12.5	70.8	16.7	46.5
	Working hours influence	22	53.4	24.6	64.7
	Managerial duties	6.5	87.2	6.3	23.8
	Short-term prospects	24.1	56.9	19.1	62

Figure A.1. All workers (employees and self-employed) – total exits (as a % of all workers) and composition of non-employment exits and composition of employment exits by wave pairing.

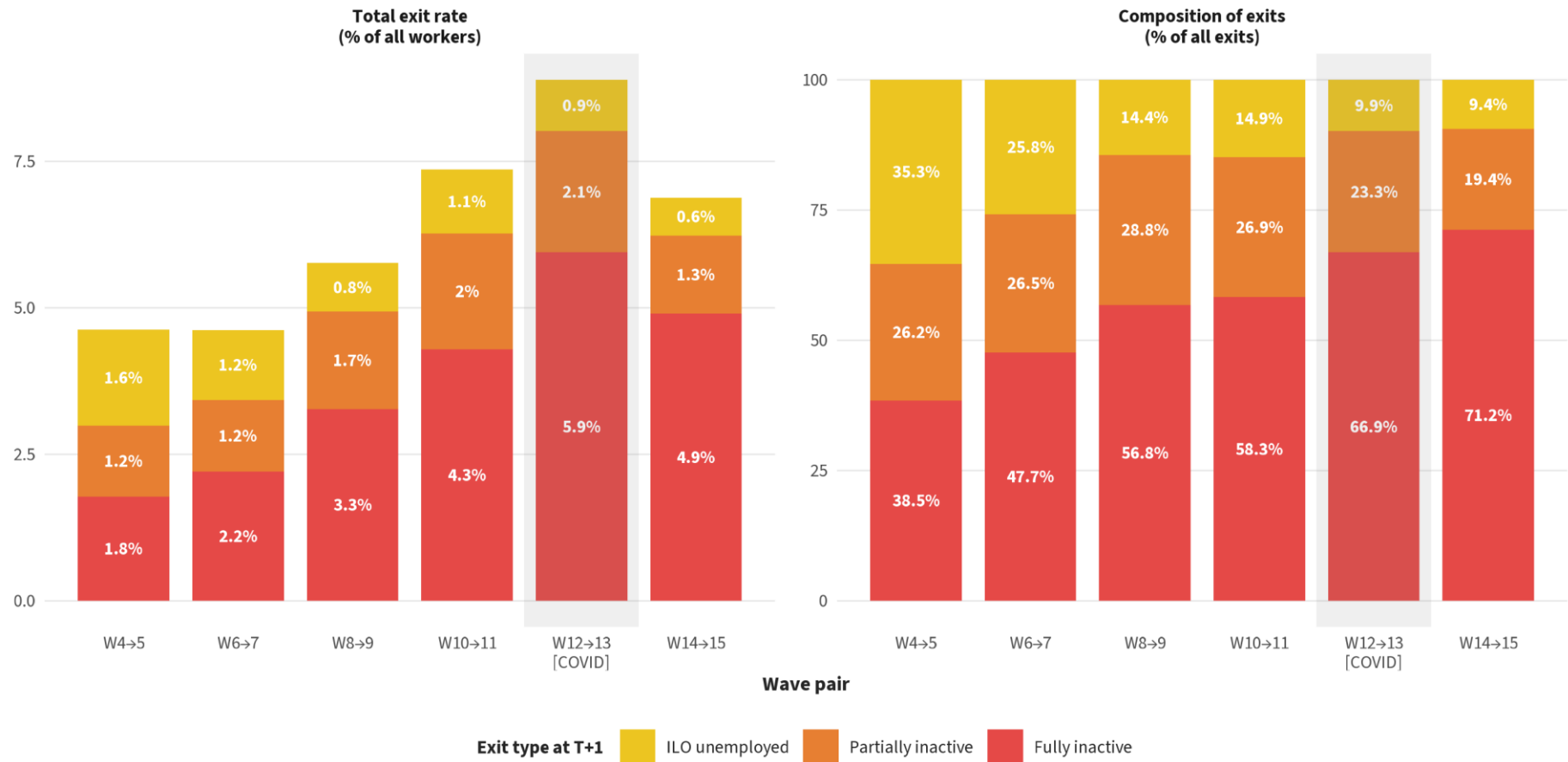


Figure A.2. All workers – total exits by QoW quintile (% in QoW quintile) and composition of exits by QoW quintile by wave pairing.

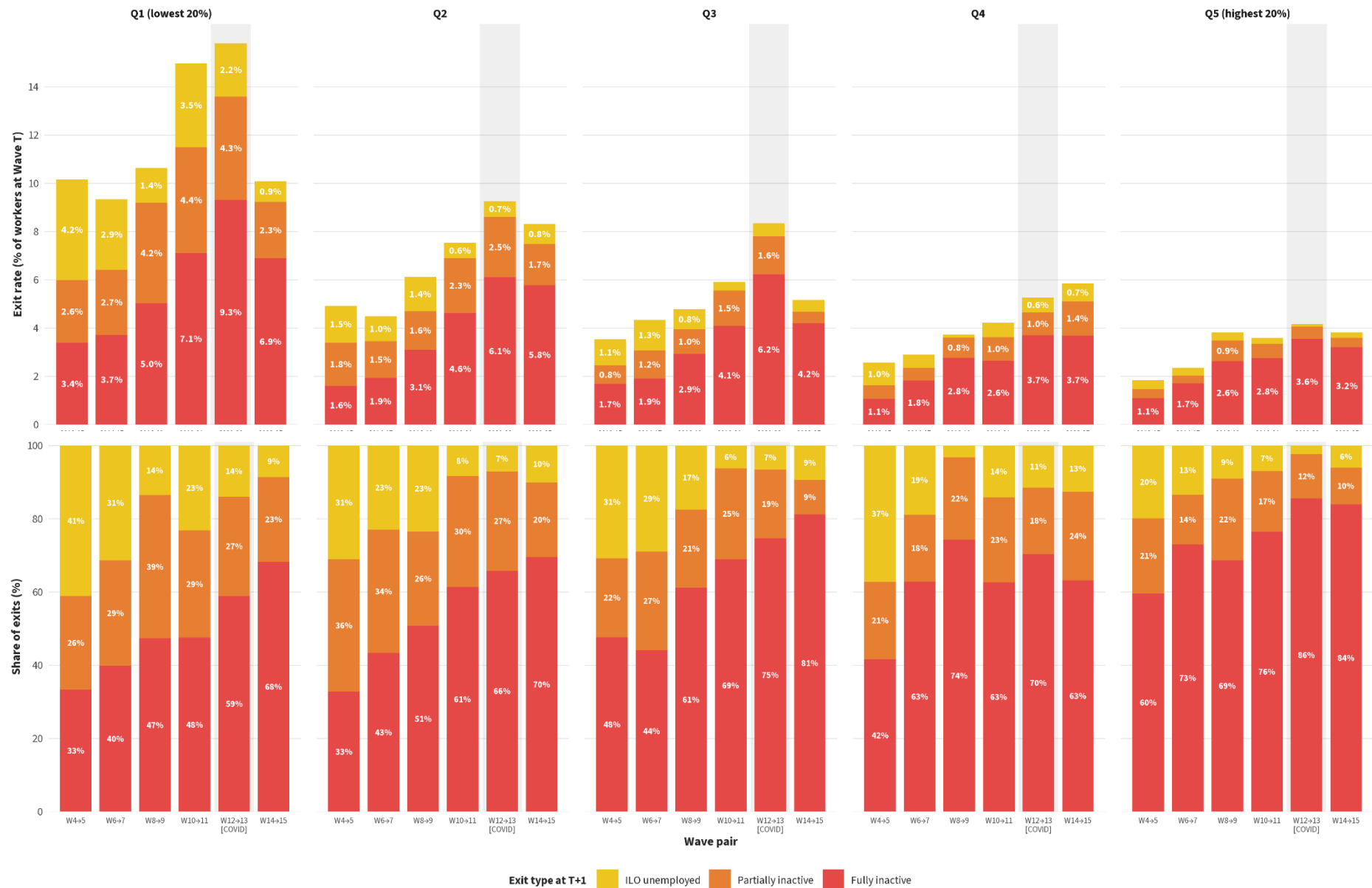


Figure A.3. All workers – composition of non-employment exits by quintile in each wave pairing.

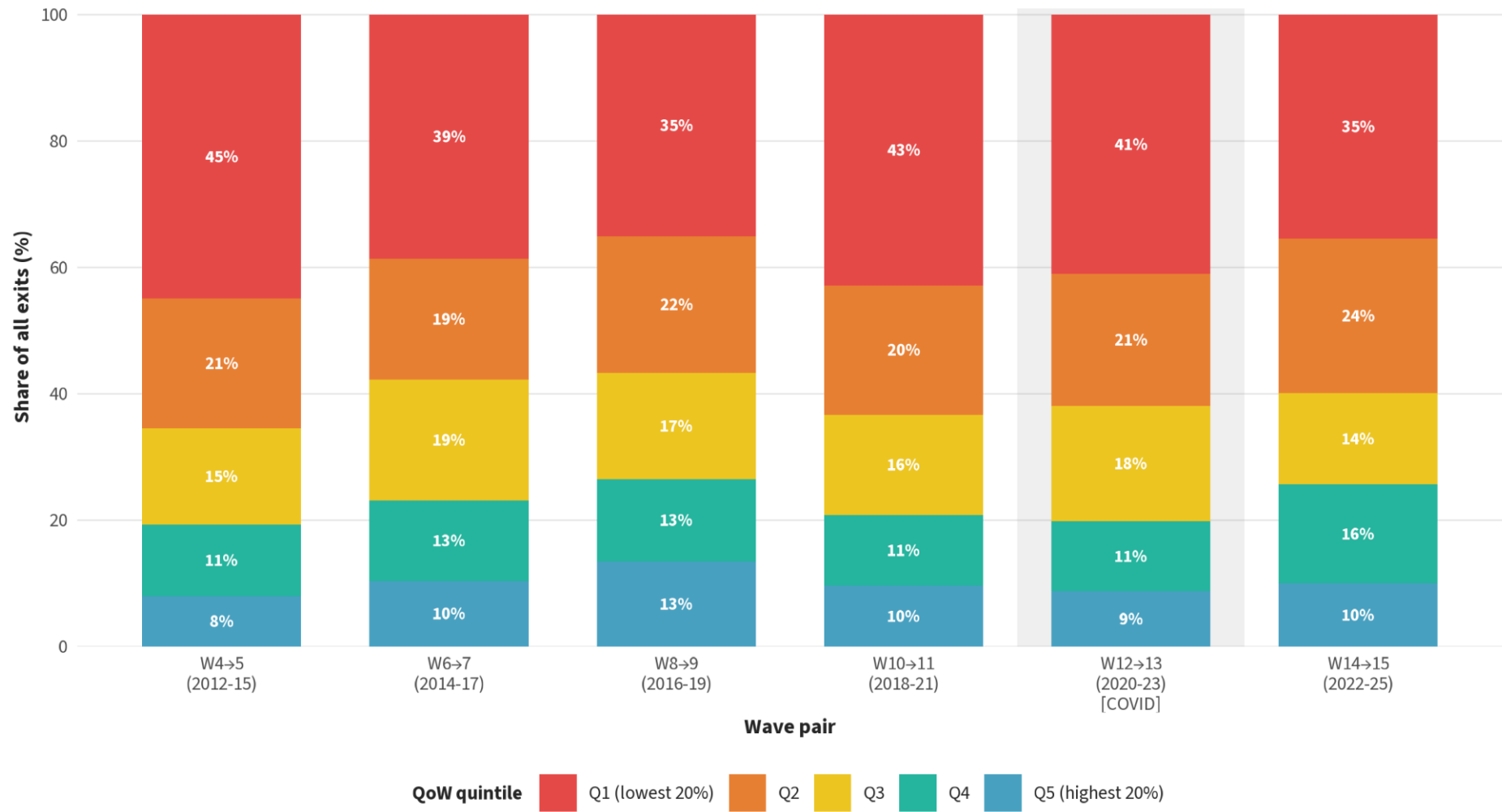
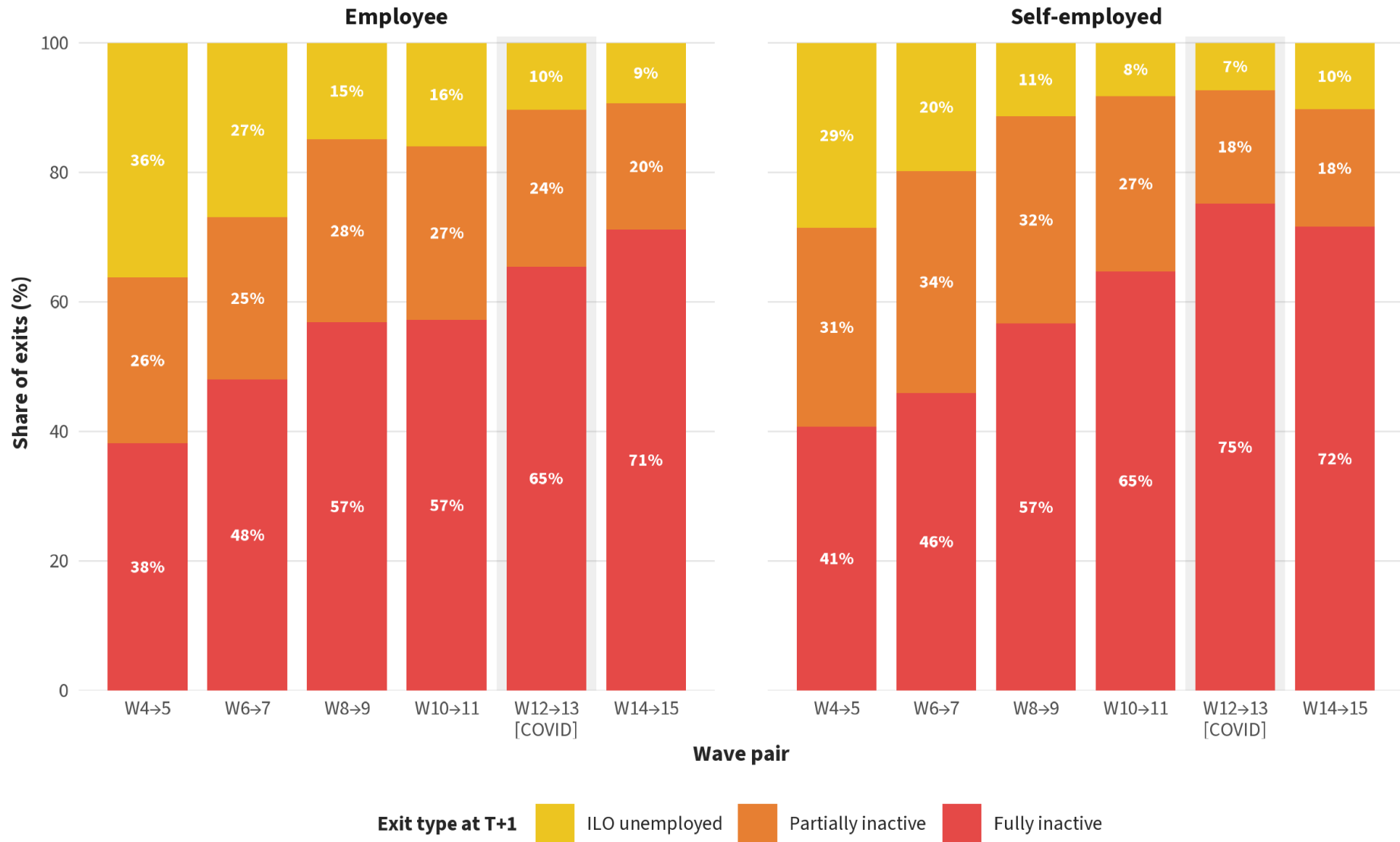


Figure A.4. Self-employed workers only - composition of non-employment exits by quintile in each wave pairing. Note: uses a specific self-employed-only quintile construction (i.e. where Q1 = bottom 20% of self-employed QoW distribution), so not directly comparable to the 'all worker' figure.



Figure A.5. Composition of exits into non-employment for employees vs. self-employed by wave pairing.



ENDNOTES

- ¹ Stephens, T., and Mosley, M. (2026). *The good work effect: How high-quality work can lead a jobs recovery*. New Economics Foundation. <https://neweconomics.org/2026/07/the-good-work-effect>
- ² We use a derived variable (pensioner_dv) which dynamically accounts for changes in the state pension age at the time of interview. Respondents above state pension age are excluded from the analysis. Our approach here slightly differs from other analysis, which excludes everyone aged 60 or over (Budak et al., 2024).
- ³ Trades Union Congress. (2003). *Things have got better – labour market performance 1992–2002*. <https://www.tuc.org.uk/research-analysis/reports/things-have-got-better-%E2%80%93-labour-market-performance-1992-2002>
- ⁴ Beatty, C. (1996). *Geographical variation in the labour market adjustment process: The UK coalfields 1981–91* (Urban & Regional Development Papers). Centre for Regional Economic and Social Research, Sheffield Hallam University.
- ⁵ Beatty, C., Fothergill, S., & Powell, R. (2007). Twenty years on: Has the economy of the UK coalfields recovered? *Environment and Planning A: Economy and Space*, 39, 1654–1675. <https://doi.org/10.1068/a38216>
- ⁶ Beatty, C., Fothergill, S., & Macmillan, R. (2000). A theory of employment, unemployment and sickness. *Regional Studies*, 34, 617–630. <https://doi.org/10.1080/00343400050178429>
- ⁷ Blanchflower, D. G. (2019). *Not working: Where have all the good jobs gone?* Princeton University Press.
- ⁸ Stephens, T. C. (2025). What has happened to job quality in Britain? The implications of different weighting methods using a UK Quality of Work Index, 2012–21. *Social Indicators Research*, 177, 833–861. <https://doi.org/10.1007/s11205-025-03542-9>
- ⁹ Stephens, T. C. (2023). *Change, stagnation and polarisation in UK job quality, 2012–21: Evidence from a new Quality of Work index* (CASE Paper No. 230). Centre for Analysis of Social Exclusion, London School of Economics and Political Science. <https://sticerd.lse.ac.uk/CASE/NEW/PUBLICATIONS/abstract/?index=10360>
- ¹⁰ Green, F. (2026). *Hard at work: Job quality, wellbeing and the global economy (forthcoming)*. Oxford University Press. <https://doi.org/10.1093/oso/9780197692516.001.0001>
- ¹¹ Leschke, J., Watt, A., & Finn, M. (2008). *Putting a number on job quality? Constructing a European Job Quality Index* (No. WP 2008.03). European Trade Union Institute. <https://www.etui.org/sites/default/files/WP2008%2003.pdf>
- ¹² Muñoz de Bustillo, R., Fernandez-Macias, E., Anton, J.-I., & Esteve, F. (2011). *Measuring more than money: The social economics of job quality*. Edward Elgar.
- ¹³ The Employment Rights Act 2025 will change the situation for employees, breaking the link between continuity of employment and rights against unfair dismissal. Its use in this index reflects the legal situation of these workers during the period covered by this study.
- ¹⁴ In practice, only a small number of respondents, often numbering in the hundreds, are surveyed in the third year of each wave, so it is often more appropriate to describe these waves as covering the first two years in each wave, for example, with Wave 4 just covering 2012–13. This is also important for distinguishing the effects of the Covid-19 pandemic. In practice, the overwhelming majority of those surveyed in Wave 10 were surveyed before the first lockdown, meaning Wave 12 comprises many workers affected by the Covid-19 pandemic (though not exclusively so). Nevertheless, we describe each wave as covering three years here as this strictly aligns with the survey period for each wave of *Understanding Society*.
- ¹⁵ Webber, D., Page, D., Veliziotis, M., & Johnson, S. (2015). *Does poor health affect employment transitions?* Joseph Rowntree Foundation. <https://uwe-repository.worktribe.com/preview/833958/JRF%20FINAL%20PUBLISHED.pdf>
- ¹⁶ Department for Work and Pensions, & Department of Health and Social Care. (2021). *A study of work and health transitions: analysis of Understanding Society* (DWP Research Report No. 994). Department

for Work and Pensions. <https://www.gov.uk/government/publications/a-study-of-work-and-health-transitions-analysis-of-understanding-society>

¹⁷ Department for Work and Pensions. (2025). *The employment of disabled people 2025*.

<https://www.gov.uk/government/statistics/the-employment-of-disabled-people-2025/the-employment-of-disabled-people-2025>

¹⁸ Office for National Statistics. (2022). *Job quality in the UK – analysis of job quality indicators: 2021*.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/articles/jobqualityindicatorsintheukhourspayandcontracts/2021>

¹⁹ Budak, A. A., Florisson, R., Leka, S., Martin, A., & Williams, G. (2024). *Stemming the tide: Healthier jobs to tackle economic inactivity*. Work Foundation, Lancaster University. <https://www.lancaster.ac.uk/work-foundation/publications/stemming-the-tide>

²⁰ Florisson, R., & Navani, A. (2024). *No progress? Tackling long-term insecure work*. The Work Foundation. <https://www.lancaster.ac.uk/work-foundation/publications/no-progress>

²¹ Health Foundation. (2025). *Relationship between low-quality jobs and health*.

<https://www.health.org.uk/evidence-hub/work/job-quality/relationship-between-low-quality-jobs-and-health>

²² Balogh, R., Dix, G., Harris, J., Toro, C., & Warhurst, C. (2025). *The case for creating healthy jobs: A review of the evidence* (ReWAGE Evidence Paper). Warwick Institute for Employment Research.

https://warwick.ac.uk/fac/soc/ier/rewage/publications/the_case_for_creating_healthy_jobs_a_review_of_the_evidence_evidence_paper_050325.pdf

²³ Bambra, C., McNamara, C., Munford, L., & Wickham, S. (2025). To get Britain working we need to get Britain healthy. *BMJ* 388, r76. <https://doi.org/10.1136/bmj.r76>

²⁴ McNeill, C., & Lanning, T. (2025). *Healthy by design? Why better jobs for all should be a goal for UK industrial policy*. Timewise. <https://timewise.co.uk/article/why-healthy-job-design-is-critical-to-tackling-economic-inactivity/>

²⁵ Other work uses dimension-level analysis; this report is restricted to indicator-level analysis to avoid adding another layer of complexity.

²⁶ This takes the form $\text{logit}(P(\text{NE}_{i,t+1} = 1)) = \beta_0 + \beta_1 \text{JQ}_{i,t} + \beta_2 \text{X}_{i,t} + \varepsilon_{i,t}$. $\text{NE}_{i,t+1}$.

Where:

$\text{NE}_{i,t}$ = a binary indicator for exit into non-employment by wave T+1. As explained in the text, this is the probability of exit into non-work.

$\text{JQ}_{i,t}$ = a job quality index score (0-100) at wave T.

$\text{X}_{i,t}$ = a vector of control variables at wave T (and T+1 for any time-varying factors).

²⁷ Department for Work and Pensions, & Department of Health and Social Care. (2021). *A study of work and health transitions: analysis of Understanding Society* (DWP Research Report No. 994). Department for Work and Pensions, London, UK. <https://www.gov.uk/government/publications/a-study-of-work-and-health-transitions-analysis-of-understanding-society>

²⁸ This takes the form: $\text{NE}_{i,t+1} = \alpha + \beta^1 \text{Q}^{1i,t} + \beta^2 \text{Q}^{2i,t} + \beta^3 \text{Q}^{3i,t} + \beta^4 \text{Q}^{4i,t} + \gamma \text{X}_{i,t} + \delta^t + \varepsilon^{i,t}$.

Where:

$\text{Q}^{1i,t} - \text{Q}^{4i,t}$ = dummy variables for QoW quintile at Wave T; Q5 (highest quality) is an omitted reference category.

δ^t = wave fixed effects.

$\varepsilon^{i,t}$ = error term; standard errors clustered by individual identifier (pidp).

²⁹ Binder, M., & Freytag, A. (2013). Volunteering, subjective well-being and public policy. *Journal of Economic Psychology*, 34, 97–119. <https://doi.org/10.1016/j.joep.2012.11.008>

³⁰ This takes the form: $\text{NE}_{i,t+1} = \alpha_i + \beta_1 \text{JQ}_{i,t} + \beta_2 \text{X}_{i,t} + \varepsilon_{i,t}$. Where α_i represents individual-specific intercepts that absorb all time-invariant confounding.

³¹ It takes the form: $\Delta \text{NE}_{i,t} = \beta_1 \Delta \text{JQ}_{i,t} + \beta_2 \Delta \text{X}_{i,t} + \gamma_t + \varepsilon_{i,t}$. Where Δ denotes first-differences, which as noted previously are changes in outcomes. For job quality, this can be written as: $\Delta \text{JQ}_{i,t} = \text{JQ}_{i,t} - \text{JQ}_{i,t-1}$.

³² Lawton, R. N., Gramatki, I., Watt, W., & Fujiwara, D. (2021). Does volunteering make us happier, or are happier people more likely to volunteer? Addressing the problem of reverse causality when estimating the wellbeing impacts of volunteering. *Journal of Happiness Studies*, 22, 599–624.

<https://doi.org/10.1007/s10902-020-00242-8>

³³ Murphy, L. (2022). *Not working: Exploring changing trends in youth worklessness in the UK, from the 1990s to the Covid-19 pandemic*. The Health Foundation and Resolution Foundation.

<https://www.resolutionfoundation.org/app/uploads/2022/06/Not-working.pdf>

³⁴ Department for Work and Pensions, & Department of Health and Social Care. (2021). *A study of work and health transitions: analysis of Understanding Society* (DWP Research Report No. 994). Department for Work and Pensions, London, UK. <https://www.gov.uk/government/publications/a-study-of-work-and-health-transitions-analysis-of-understanding-society>

³⁵ Note that in this and all subsequent tables, asterisks denote statistical significance: *** = $p < 0.001$; ** = $p < 0.01$; * $p < 0.05$.

³⁶ Balogh, R., Dix, G., Harris, J., Toro, C., & Warhurst, C. (2025). *The case for creating healthy jobs: A review of the evidence* (ReWAGE Evidence Paper). Warwick Institute for Employment Research.

https://warwick.ac.uk/fac/soc/ier/rewage/publications/the_case_for_creating_healthy_jobs_a_review_of_the_evidence_evidence_paper_050325.pdf

³⁷ McNeill, C., & Lanning, T. (2025). *Healthy by design? Why better jobs for all should be a goal for UK industrial policy*. Timewise. <https://timewise.co.uk/article/why-healthy-job-design-is-critical-to-tackling-economic-inactivity/>

³⁸ Warhurst, C., Toro, C., Harris, J., Dix, G., & Balogh, R. (2025). *Creating healthy jobs* (ReWAGE Policy Brief). Warwick Institute for Employment Research. https://warwick.ac.uk/fac/soc/ier/rewage/news-archive/the_case_for_creating_healthy_jobs_a_review_of_the_evidence_policy_brief_050325_b.pdf

³⁹ It should be stressed that this is essentially 20 sets of regressions run on each indicator separately. This carries an obvious limitation, since the effects shown may reflect a correlation between these indicators and other indicators in the QoW index.

⁴⁰ For the analysis in this chapter, data for the Long-Term Prospects indicator and the Health & Safety dimension indicator are not used, because they are not well-suited for an FD/FE specification as they are derived from workers' occupations and industries of employment, and there was insufficient individual variation to identify a causal effect.

⁴¹ Note that the decision to group these into QoW indicators in this way was informed by the correlation between these indicators. Autonomy over job tasks and work pace are relatively more highly correlated with each other as they are with work manner and order, and working hours autonomy is the least correlated with the other four – justifying its use in a separate Working Time Quality dimension.

⁴² Mujcic, R., & Oswald, A. J. (2025). The growth and collapse of autonomy at work. *Proceedings of the National Academy of Science*, 122, e2504419122. <https://doi.org/10.1073/pnas.2504419122>

⁴³ Note that in the *Understanding Society* questionnaire, autonomy variables are scored 1 (full control) to 4 (no control), so that a higher numeric score denotes less autonomy. A positive coefficient therefore indicates that workers with less autonomy over their work are more likely to exit employment. Further note that all four models are regressing on the same predictor, so unlike Table 1 the signs go in the same direction.

⁴⁴ Budak, A. A., Florisson, R., Leka, S., Martin, A., & Williams, G. (2024). *Stemming the tide: Healthier jobs to tackle economic inactivity*. Work Foundation, Lancaster University. <https://www.lancaster.ac.uk/work-foundation/publications/stemming-the-tide>

⁴⁵ Department for Work and Pensions, & Department for Business and Trade. (2025). *Keep Britain working: Final report*. Department for Work and Pensions.

<https://www.gov.uk/government/publications/keep-britain-working-review-final-report/keep-britain-working-final-report>

⁴⁶ Williams, C. C., & Horodnic, I. A. (2018). Evaluating the prevalence and distribution of dependent self-employment: some lessons from the European Working Conditions Survey. *Industrial Relations Journal*, 49, 109–127. <https://doi.org/10.1111/irj.12206>

⁴⁷ Office for National Statistics. (2026). *UK self-employment jobs SA: Total (thousands)*.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/timeseries/dyzn/lms>

⁴⁸ Note the comparison here is with those on zero-hours contracts vs all employees. This sets a higher bar than, for example, comparing those on zero-hours vs all other workers (employees + self-employed).

⁴⁹ Office for National Statistics. (2026). *EMP17: People in employment on zero hours contracts*.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/emp17peopleinemploymentonzerohourscontracts>

⁵⁰ DWP, DHSC, 2021. *A study of work and health transitions: analysis of Understanding Society* (DWP Research Report No. 994). Department for Work and Pensions, London, UK.

<https://www.gov.uk/government/publications/a-study-of-work-and-health-transitions-analysis-of-understanding-society>

⁵¹ Webber, D., Page, D., Veliziotis, M., & Johnson, S. (2015). *Does poor health affect employment transitions?* Joseph Rowntree Foundation, York, UK. <https://uwe-repository.worktribe.com/preview/833958/JRF%20FINAL%20PUBLISHED.pdf>

⁵² This takes the form $NE_{it+1} = \alpha_i + \beta_1 HJ_{it} + \beta_2 HD_{it \rightarrow t+1} + (\beta_1 HJ_{it} * \beta_2 HD_{it}) + \gamma X_{it} + \alpha I + \epsilon_{it}$. Where:

- NE_{it+1} = Employment exit at wave t+1 (binary: 0/1)
- HJ_{it} = LEVEL of Healthy Jobs Composite score at wave t (0-100 scale)
- $HD_{it \rightarrow t+1}$ = Binary indicator for health deteriorating between wave T and wave T+1. Measured in three separate models:
 - Mental health: = 1 if score increased (worsened)
 - Physical health: = 1 if score increased (worsened)
 - LT illness: = 1 if developed NEW condition (0→1)
- γX_{it} = A set of time-varying controls (the same as in Model 3a, described earlier).
- αI = Individual fixed effect (time-invariant characteristics)

⁵³ This takes the form $NE_{i,t+1} = \alpha + \beta_1 HJ_{i,t} + \beta_2 HD_{i,t \rightarrow t+1} + \beta_3 (HJ_{i,t} \times HD_{i,t \rightarrow t+1}) + \gamma X_{i,t} + \delta t + \epsilon_{i,t}$. Where, as in Chapter 1, δt = wave fixed effects; and standard errors clustered by pidp.

⁵⁴ Stiller, M., Ebener, M., & Hasselhorn, H.M. (2023). Job quality continuity and change in later working life and the mediating role of mental and physical health on employment participation. *J. Labour Mark. Res.* 57, 12. <https://doi.org/10.1186/s12651-023-00339-6>

⁵⁵ Note that this is the proportion of consecutive wave-pair observations in which a given indicator did not change. This therefore counts the same individuals multiple times, and so is less preferred to the final column: e.g. a person appearing in five waves has four consecutive-pair observations.

⁵⁶ This is the proportion of individuals across the whole sample whose indicator score ever differed from their first score across all their observations. It is therefore not directly comparable to the figures in the three other columns.