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Housing Insecurity in England: A quantitative analysis

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Abstract

This thesis makes an original contribution to the body of research on welfare reform and housing outcomes by investigating the unequal effects of policy changes and wider economic shifts on housing insecurity in England in the 21st century. In particular, the research explores the populations and places that are most vulnerable to increases in housing insecurity associated with the introduction of Universal Credit. The research also situates these changes within the wider timeline of housing insecurity in England, considering their interactions with the 2008 Global Financial Crisis. These research questions were investigated using quantitative methods including difference-in-differences, logistic regression, and multilevel modelling applied to Understanding Society and British Household Panel Survey data (2003 to 2022).

The thesis provides insights into current and developing populations and places that are at disproportionate risk of experiencing housing payment problems, and current flaws in the Universal Credit system that contribute to unequal and sometimes harmful housing outcomes. The overarching timeline for working-age social and private renters and mortgaged homeowners was found to be characterised by a large and persistent increase in the risk of housing insecurity following the 2008 Global Financial Crisis, and the gradual recovery from this crisis has been inhibited by the 2012 welfare reformst. Findings demonstrated that the introduction of Universal Credit has a significant effect on increasing the likelihood of housing insecurity for the overall sample of social and private renters in comparison to the legacy benefits of Housing Benefit or Jobseeker's Allowance. Vulnerability to this effect was found to vary significantly according to demographic group, with characteristics such as having a disability increasing the likelihood of housing insecurity, and across low-level geographies of MSOAs and LSOAs.

The thesis highlights the misalignment between the current centralised nature of Universal Credit and the spatial and demographic heterogeneity of the populations and places to which it is applied. This negatively impacts particular population groups more than others, placing these claimants at disproportionate risk of experiencing financial hardship and housing insecurity. There is also potential for economic shocks to further entrench this inequality, interacting with particular populations differently to aggregate existing housing inequalities or generate new ones.

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Chapter 1 Introduction

1.1 Research context

The UK housing landscape from the beginning of the 21st century to the present day has undergone significant change, characterised by several pivotal shifts. This period has seen a marked increase in the Private Rental Sector (PRS) in the UK, alongside a wider trend of deregulation of the sector across many European countries including the UK (Whitehead, Markkanen, Monk & Scanlon, 2012) and generally rising rental costs (ONS, 2023d). In England, 19% of the population now lives in privately rented housing (MHCLG, 2020) compared to a tenth of the population in the early 2000s (Whitehead, Markkanen, Monk & Scanlon, 2012). The beginning of this period of PRS growth coincided with the end of a long period of residualisation of social housing in the UK, shifting social housing from something available to a broad range of households to a 'safety net' provision for a small, vulnerable proportion of the population (Pearce & Vine, 2014). These shifts take place against a wider global backdrop of an increasingly financialised model of housing, privileging better resourced households and contributing to unequal access to housing opportunities, particularly home ownership (Kennett, Forrest & Marsh, 2012). These factors combine to form a UK housing landscape shaped by inequality, unaffordability, and shrinking housing opportunities.

Alongside shifts in housing, the UK has undergone significant changes in the structure and ideological foundation of its welfare system. These changes are situated within the wider European response to the 2008 Global Financial Crisis, which saw many states focus on the reduction of spending (Koch & Reeves, 2021) and adopt increasingly narrow and conditional benefit systems (Gingrich & King, 2019). In the UK, this manifested most significantly in the 2012 Welfare Reform Act and related reforms (Table 1.1) introduced by the Conservative–Liberal Democrat coalition government. This set of reforms aimed to reduce apparent welfare dependence and spending by centralising the welfare system and incentivising work (DWP, 2015). The reform package included significant changes such as the Benefit Cap, an upper limit on the total amount a household can claim in benefits, and the introduction of Universal Credit, an integrated benefit for all working age claimants, replacing a variety of legacy benefits (Housing Benefit, income-related Employment and Support Allowance, income-based Jobseeker's Allowance, Child Tax Credit, Working Tax Credit, and Income Support) to create one centralised system. This systematic change has been linked to a shift in the purpose of the welfare system from social security to 'active citizenship', requiring claimants to meet conditions and obligations to be entitled to support (Koch & Reeves, 2021;

Dwyer & Wright, 2014). The reforms have been linked to an increase in financial and housing precarity for some claimants, with particular associations found between moving to Universal Credit and financial hardship and debt (Cheetham, Moffatt & Addison, 2018; Stacey, 2020), food bank usage (Reeves & Loopstra, 2020), and sanctioning (Adler, 2018; Webster, 2022). In combination, the reforms have therefore contributed to a current UK welfare system that is characterised by conditionality, precarity, and centralisation, with one benefit in the form of Universal Credit replacing several legacy benefits that served different populations and purposes.

Table 1.1 - Summary of key UK welfare reforms (2010 - 2016)

Based on information from Hobson, 2022

June 2010 Budget	
• The introduction of £11 billion of welfare-related budget cuts. • Changing the uprating measure of benefits (excluding State Pension) to a Consumer Prices Index (CPI) based model, bringing benefit uprating in line with a lower measure of inflation. • Reducing Local Housing Allowance (LHA) from the median to the 30th percentile of local rents.	
Welfare Reform Act 2012	
Universal Credit	See Section 1.1.1
Personal Independence Payment (PIP)	Disability Living Allowance (DLA) was replaced with PIP, introducing a new assessment process and requiring reassessment for most DLA claimants (Citizens Advice, 2022).
Under-Occupation Deduction (Bedroom Tax)	A reduction of Housing Benefit for social renters classed as having a spare bedroom.
Benefit Cap	An upper limit on the total amount of benefit income per household.

Other changes included: ● Changing the uprating measure of Local Housing Allowance to a CPI based model, rather than in line with local rents. ● Stricter sanctioning and conditionality for Jobseekers Allowance (JSA), Employment and Support Allowance (ESA), and Universal Credit claimants. ● Limiting ESA to 12 months for claimants classed as able to work in the future. ● Localisation of Council Tax support. ● The simplification of the State Pension system.
Welfare Reform and Work Act 2016
Changes included: ● The introduction of a four-year freeze on the uprating of most working age benefits. ● Changing the Benefit Cap to a lower limit on household benefit income. ● The introduction of a two-child limit for Child Tax Credits and Universal Credit. ● The gradual reduction of social housing rent levels by 1% per year for a period of four years.

1.1.1 Universal Credit policy context (adapted from Chapter 2 literature review)

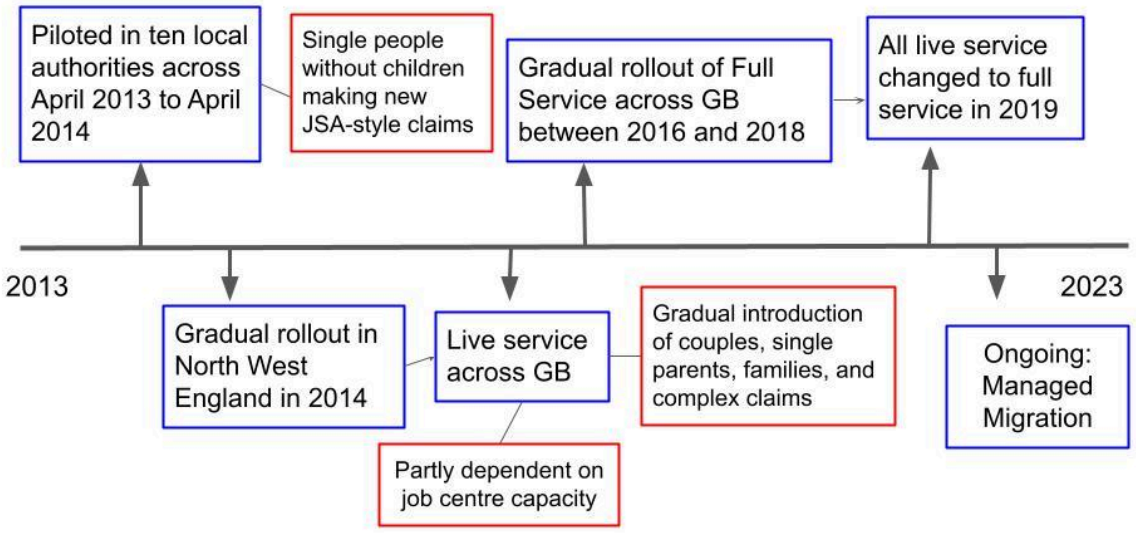
Universal Credit is an integrated benefit for all working age claimants, replacing 6 legacy benefits to create one centralised system. The legacy benefits replaced by Universal Credit are:

- Housing Benefit (HB), a benefit that helps low-income claimants pay for rent.
- Jobseeker's Allowance (JSA), a benefit for claimants who are working fewer than 16 hours per week, are able to work, and are seeking employment.
- Working Tax Credit (WTC), a benefit providing financial support for claimants who are in work and on a low income.
- Income Support (IS), a benefit providing financial support for claimants on low or no income who are not able to work.
- Child Tax Credit (CTC), a benefit providing financial support for claimants who are on a low income and have dependent children.
- Employment and Support Allowance (ESA), a benefit providing financial support for claimants with disabilities that affect their capacity to work.

Universal Credit was introduced to simplify benefit claims, and to reduce perceived welfare dependency and spending by centralising the welfare system and incentivising work (UK Govt., 2015). The implementation of Universal Credit (Figure 1.1) began with a pilot

programme in 2013 in several towns, mainly in the North of England (DWP, 2014, p7). Initial access to Universal Credit was limited to single non-homeowners without children who did not have a HB claim and were making a new JSA claim (DWP, 2014, p7; D'Este & Harvey, 2020, p.12). National expansion began in February 2015 (DWP, 2021), with Universal Credit gradually rolling out to more areas and claimant types until December 2018, when Universal Credit was available to all claimant types across Great Britain making new or changed claims (DWP, 2021). The next stage of the programme is "Managed Migration", through which existing legacy benefit claimants without a change in circumstances will be moved to the legacy benefit system. Other than a pilot programme that began in Harrogate in July 2019 (DWP, 2021), "Managed Migration" is currently not being implemented, but is projected to take place between 2023 and 2029 (DWP, 2023). In November 2010 the DWP recorded 4.8 million Housing Benefit (HB) claimants and 1.4 million Jobseeker's Allowance (JSA) claimants (DWP, 2010). By May 2020, the distribution of claimant numbers had changed significantly due to the introduction of Universal Credit, with 3.1 million HB claimants, 170,000 JSA claimants, and 5.4 million Universal Credit claimants, 2.4 million of whom included a housing element in their claim (DWP, 2020a).

Figure 1.1 - Timeline of Universal Credit rollout (2013-2023)



Due to the gradual rollout of Universal Credit, selection into the Universal Credit claimant group is affected by a number of entry effects. At different stages in the rollout, a claimant's allocation into the Universal Credit or legacy benefit system is affected by the date of their claim, their location, their household characteristics, and on what grounds they are making a claim (DWP, 2014, p11). The early inclusion of demographic groups at higher risk of housing insecurity, such as single adult households, and the requirement for claimants to be making

a new or adjusted claim to enter the Universal Credit system may have a selection effect on the Universal Credit claimant group, leading to a disproportionately increased level of housing insecurity. Another key entry effect influencing the rollout was Job Centre deliverability, linked to the size and performance of job centres, the local labour markets they operate in (DWP, 2014, p14), and the ability of staff training and IT practices to support the new system (D'Este & Harvey, 2020, p.12), and therefore not directly related to client characteristics. In order to compare the Universal Credit and legacy benefit claimant groups throughout the rollout, it is therefore necessary to allow for these entry effects and utilise similar samples.

1.1.1.1 Universal Credit operational details

Based on UK Govt., 2023.

People in the UK are eligible for Universal Credit if they are of working age and have £16,000 or less in savings and investments, including in-work and out-of-work claimants. Eligibility may also be affected by migration status and the income and savings of a partner living in the same household. The application process involves supplying identity documentation, a payment account, an address, and a range of information (e.g. housing, income, disability status). The claimant is also required to attend a meeting and agree to a Claimant Commitment, which outlines requirements such as job-seeking, working additional hours, preparing for work, attending Jobcentre appointments, reporting changes in circumstances, and online claim management (e.g. replying to messages). If a commitment is not met, the claimant may receive a sanction in the form of the reduction or termination of their Universal Credit payments. If the claim is accepted, there is a minimum five week wait before the claimant receives their first payment, intended to replicate monthly payment schedules in the world of work. If the claimant previously claimed legacy benefits, they will continue to receive their previous benefit for two weeks after their Universal Credit claim is accepted, resulting in a three week gap in benefit payments. At this stage, claimants are able to apply for an advance payment that will be deduced from later Universal Credit payments.

Universal Credit payments are calculated and paid monthly, meaning that the payment amount can vary month-on-month if circumstances change. Claimants can apply for an Alternative Payment Arrangement if they are unable to manage a single monthly payment due to characteristics that make them vulnerable (DWP, 2020c). The Universal Credit payment consists of:

- A standard allowance per household that varies between £292.11 and £578.82 based on whether claimants are under or over 25, and whether they are single or living with a partner.
- Additional allowances may be given for:
    - Up to two children living in the household
    - Childcare for in-work claimants
    - Claimants with limited capability for work due to disability
    - Claimants who provide 35 or more hours of care per week for someone receiving a disability-related benefit
    - Some housing costs

Universal Credit payments may also be subject to deductions if:

- A sanction is applied
- The claimant is paying back a Universal Credit advance payment
- The claim exceeds the Benefit Cap
- The claimant has over £6000 in savings
- The claimant receives other benefit income or income from employment
- The claimant has previously had their benefits overpaid
- The claimant owes money for essential bills
- The claimant is paying back a hardship payment, which is received when essential costs can't be met due to a sanction

1.1.2 Impact of Universal Credit

Existing research into the Universal Credit welfare reform and its effects frequently finds associations between Universal Credit and increased financial insecurity. Cheetham, Moffatt and Addison's interview-based study into the experiences of Universal Credit claimants (2018) found that financially vulnerable households who moved onto the Universal Credit system were often pushed into financial "hardship and crisis", particularly for more at-risk claimants such as disabled people or lone parents (p37). Foster and colleagues' survey of Universal Credit claimants on behalf of the DWP found that 36% of respondents were in housing arrears, and 65% of those in arrears had gone into debt after claiming Universal Credit (DWP, 2018, p16). Reeves and Loopstra's analysis of food bank usage and Universal Credit identified a significant and persistent association between the rollout of Universal Credit and a rising food bank use (2020, p17).

Several features of Universal Credit's implementation have been associated with increased risk of financial hardship. While conditionality is not a new characteristic of welfare policy in the UK, it has become increasingly prominent in recent welfare reform (Preece, Hickman & Pattison, 2020, p1216), with the introduction of Universal Credit notably applying new conditionality measures to in-work claimants. The change in conditionality is most apparent in the changes in sanctioning, a measure by which benefit payments are reduced for a set period of time in response to a claimant failing to meet required claimant responsibilities. Adler (2018) asserts that the Universal Credit system has a higher sanctioning rate than the legacy system, estimating that in 2019 JSA claimants had a sanctioning rate of 0.5% while Universal Credit claimants had a sanctioning rate of around 3%. Furthermore, unlike in the legacy system, these sanctions can now be deducted from the housing element of Universal Credit (Reeves & Loopstra, 2020, p3). Universal Credit also involves a waiting period of at least 5 weeks between the acceptance of a claim and the first payment, intended to replicate monthly payment schedules in the world of work. Claimants' experiences indicate that this payment gap can cause financial hardship, including going into debt (Reeves & Loopstra, 2020, p3; Stacey, 2020, p30). Although advance payments are possible, these payments are then automatically deducted from future Universal Credit payments, simply deferring the financial hardship (Reeves & Loopstra, 2020, p4). Universal Credit is a fully digitised system, resulting in difficulties for many claimants due to limited access to computers or the internet (DWP, 2018, p13), potentially leading to reduced access and increased sanctioning due to missed information for more vulnerable claimants.

Most crucially for housing outcomes, the Universal Credit system by default directly pays its housing element to claimants rather than landlords. Analysis of the DWP 2012-13 trial of direct payment demonstrated a negative impact on rent payments, with rent underpayment increasing by 5.5% upon the introduction of direct payment, settling to a 2% increase as claimants became more used to the new system (Wilson, 2019, p579). This underpayment was found across all demographics and household types, and was primarily caused by financial precarity (Hickman, Kemp, Reeve & Wilson, 2017, p.1116). Hickman asserts that insights drawn from the direct payment trial are likely to also apply to Universal Credit claimants' rent behaviour (Hickman, 2021, p237), increasing the likelihood of Universal Credit claimants going into rent arrears. As well as direct payment, Universal Credit is paid monthly by default, whereas legacy benefits were often paid on a weekly or fortnightly basis. Hartfree identifies the monthly payment system as increasing the risk of financial hardship, as it is misaligned with low-income households' existing budgeting behaviours (Hartfree, 2014, p17).

1.1.3 Temporal and spatial context

The foundational changes in UK housing and welfare since the early 2000s have interacted with other elements of the UK's social and economic landscapes, further shaping inequalities. The prevalence of spatial inequality in the UK is well established, with some of the highest levels of interregional inequality among OECD industrialised countries, exhibiting higher spatial inequality than 28 other advanced OECD countries across a range of 28 indicators of inequality (McCann, 2020). Alongside regional inequality, the UK's spatial inequalities extend into other geographic levels such as variance between rural and urban spaces (Hastings, Bailey, Bramley & Gannon, 2017), and lower-level variance between and within cities, towns, and neighbourhoods (Beatty, Cole, Foden & Powell, 2014). Several researchers have associated this spatial inequality with the UK's highly centralised government system, causing "space-blind" national governmental decisions (McCann, 2020) that significantly impact local government and area conditions (Gray & Barford, 2018).

The 2003-2023 period has also seen several economic shocks with the potential to cause economic scarring, generating long-term economic damage to individuals and wider economies (Irons, 2009). Of particular significance is the 2007 Global Financial Crisis, which generated severe short-term and long-term damage to UK housing markets. Short term housing consequences included significantly reduced property values, construction, and transactions, with transactions in England and Wales peaking at 130,000 per month pre-GFC, then falling to under 30,000 a month post-GFC (Whitehead & Williams, 2011, p1161); higher lending requirements for house buyers (Jones & Richardson, 2014, p139); and a peak in the number of repossessions of mortgaged properties (Scanlon & Elsinga, 2013, p340). Long term housing consequences included increased dependence on insecure and expensive private rental for long-term accommodation, with the proportion of the UK population living in privately rented accommodation increasing from 10% in 2001 to 19% in 2013 (Kemp, 2015); an increased risk of household debt (Whitehead & Williams, 2011, p1166); and reduced housing opportunities, particularly for renters (Kennett, Forrest & Marsh, 2012). The trajectory of housing insecurity in the UK must therefore be considered within these spatial and temporal contexts.

1.2 Research aims and contribution

This thesis makes an original contribution to the body of research on welfare reform and housing outcomes by investigating the unequal effects of policy changes and wider economic shifts on housing insecurity in England in the 21st century. In particular, the

research explores the populations and places that are most vulnerable to increases in housing insecurity associated with the introduction of Universal Credit and related welfare reforms. The research also situates these changes within the wider timeline of housing insecurity in England, considering them in relation to to the 2008 Global Financial Crisis. Through these research aims, the thesis provides insights into current and developing populations and places that are at disproportionate risk of experiencing housing payment problems, and highlights current flaws in the Universal Credit system that contribute to unequal and sometimes harmful housing outcomes.

By focusing on Universal Credit and related recent policy changes and economic shocks, this research engages with a very current and relevant issue with wide-reaching effects on the UK population. While relationships between earlier welfare reform and housing outcomes are well established in the literature, with particularly strong evidence linking changes to the previous benefit system and worsening housing outcomes (Mulherin, 2019; Fitzpatrick, Mackie & Wood, 2019; Fetzer, Sen & Souza, 2019), we have fewer insights into how Universal Credit and housing interact due to its recency and long, complex rollout. The rollout began with a pilot programme in 2013 in several towns, limited to single non-homeowners without children who did not have a HB claim and were making a new JSA claim (DWP, 2014, p7; D'Este & Harvey, 2020, p.12). National expansion began in February 2015 (DWP, 2021), with UC gradually rolling out to more areas and claimant types until December 2018, when UC was available to all claimant types across Great Britain making new or changed claims (DWP, 2021). While existing studies have largely considered Universal Credit from an overall rollout-wide perspective, this thesis incorporates the complexity of Universal Credit's rollout in its research design through methods such as wave-by-wave analysis, difference in differences analysis, and multilevel modelling.

The next stage of the welfare reform programme is 'Managed Migration', through which existing legacy benefit claimants without a change in circumstances will be moved to the Universal Credit system. As the Universal Credit system's reach widens and its outcomes become increasingly entrenched in the lives of claimants, the effects evidenced in this thesis have the potential to impact more people, particularly those belonging to populations identified as vulnerable in this research. Furthermore, these vulnerabilities will continue to interact with the aftereffects of recent economic shocks and the continued recovery following the Global Financial Crisis. The findings of this research provide valuable insights and recommendations to support vulnerable populations and places at risk of housing insecurity through this period of change. The Universal Credit system is strongly associated with a number of changes in welfare policy and ideology taking place within wider European and

international contexts, such as an increased focus on conditionality and national debt reduction (Koch & Reeves, 2021; Gringrich & King, 2019). Consequently the analysis of Universal Credit and its effects is valuable beyond its immediate UK context, exemplifying and providing comparison for other national welfare policy changes.

The thesis also employs a research design that effectively reflects the practicalities of current housing policy and its wider economic context. As a relatively recent policy change, research into the effects of Universal Credit has been limited by data availability, often relying on pilot programmes of older versions of the policy (Hickman, Kemp, Reeve & Wilson, 2017) and cross-sectional data (Hardie, 2020). However, a key element of Universal Credit's implementation is its staggered rollout, introducing the policy change to different local authorities at different times and resulting in a "quasi-experimental variation" in benefit claimants receiving UC or legacy benefits (D'Este & Harvey, 2020). Several studies have built on the randomised nature of this variation, but have done so using a simplified operationalisation of the rollout based on characteristics such as place (Hardie, 2020; D'Este & Harvey, 2020) or employment status (Wickham et al, 2020). In their analysis of factors affecting housing insecurity among Universal Credit claimants, Reed (2019) noted that future research would benefit from more robustly incorporating different waves of Understanding Society data. This thesis makes an original contribution to this evidence base by incorporating the complex staggered rollout of Universal Credit in its methodology, employing place, rollout year, and individual benefit claims to more accurately reflect the practical implementation of Universal Credit and its effects on different population groups. The thesis also positions Universal Credit and other changes in housing insecurity within a wider spatial context and timeline, considering them in relation to the economic shocks of the Global Financial Crisis.

1.2.1 Data and key variables

The main dataset analysed throughout the thesis is Understanding Society (2009-2022), a longitudinal household panel study. Data is collected once each year through face-to-face interviews or self-completed online surveys from approximately 25000 households per year (CFE, 2022), which is equivalent to 0.09% of the 2022 UK population. The survey is both large and representative due to the inclusion of Ethnic Minority and Immigrant Boost samples, making it a robust and generalisable foundation for research into the UK population. Further information on the survey and sampling strategy can be found in Appendix 21. Breakdowns of the key variables are provided for the overall sample (Table 1.2), Universal Credit claimants (Table 1.3), and legacy benefit claimants (Appendix 22).

Table 1.2 Table of descriptive statistics for working age Understanding Society sample pooled over all data collection waves (2009-2020)

Variable	Measurement	Proportion			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		9%	
		0/No		91%	
Housing tenure		Social rental		17.7%	
		Private rental		15.5%	
		Owned outright		19.7%	
		Owned with mortgage		46.2%	
		Other/missing		0.9%	
Employment status		Employed		66%	
		Not employed		27%	
		Other/missing		7%	
Age bracket		18 to 20		6.3%	
		21 to 24		7.6%	
		25 to 34		19%	
		35 to 44		23%	
		45 to 54		24%	
		55 to 64		20%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		28%	
		No disability		72%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		36%	
		No (partner)		64%	
Number of dependent children in household		0		60%	
		1		16%	
		2		17%	
		3+		8%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	0.46	0.15	0	8.7
Income	Net monthly hh income (unit: £1000)	3.5	2.9	-52	724

Table 1.3 Table of descriptive statistics for working age Understanding Society sample claiming Universal Credit pooled over all data collection waves (2009-2020)

Variable	Measurement	Proportion			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		74%	
		0/No		26%	
Housing tenure		Social rental		44%	
		Private rental		21%	
		Owned outright		12%	
		Owned with mortgage		23%	
		Other/missing		0.7%	
Employment status		Employed		54%	
		Not employed		46%	
		Other/missing		0.02%	
Age bracket		18 to 20		3.8%	
		21 to 24		8.7%	
		25 to 34		21%	
		35 to 44		26%	
		45 to 54		26%	
		55 to 64		14%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		58%	
		No disability		42%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		60%	
		No (partner)		40%	
Number of dependent children in household		0		44%	
		1		20%	
		2		22%	
		3+		14%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	1	0.9	0	5.7
Income	Net monthly hh income (unit: £1000)	2.5	2.1	0	25

1.3 Structure and papers

This thesis follows a three paper format, consisting of three separate quantitative studies that investigate different elements of the overall theme of housing insecurity in England and its relationship to changes in the welfare system and economy. The thesis sets out the three papers, bookended by introduction and conclusion chapters that consider the contribution of the studies collectively.

Chapter 2: Understanding the effect of Universal Credit on housing insecurity in England: a difference-in-differences approach

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The ongoing rollout of the UK's new centralised benefit system, Universal Credit, marks a significant change in UK welfare policy impacting the majority of working age benefit claimants. Existing research has demonstrated Universal Credit's financially harmful effects for many claimants, linking it with adverse outcomes such as increased debt (Cheetham, Moffatt & Addison, 2018; Stacey, 2020) or food bank usage (Reeves & Loopstra, 2020). A potential relationship between Universal Credit and housing insecurity is therefore a timely and important research topic. Chapter 2 makes an original contribution to the discussion of policy change and housing outcomes by exploring how the shift to Universal Credit affects respondents' ability to meet their housing costs in England. The research design incorporates the multifaceted policy rollout of Universal Credit by employing multiple comparison groups (Housing Benefit and Jobseeker's Allowance claimants) and a wave-by-wave analysis. The following research questions are explored:

- What is the effect of Universal Credit on housing insecurity for claimants living in rented housing in England?
- How does housing insecurity compare or differ for Universal Credit claimants and Housing Benefit or Jobseeker's Allowance claimants?

Chapter 2 responds to the research questions using Understanding Society data (Waves 1 to 10, 2009-2020) (University of Essex, 2020) and additional administrative data. The study employs a difference-in-differences methodology, comparing housing insecurity among Universal Credit and Housing Benefit or Jobseeker's Allowance claimants before and after the introduction of Universal Credit. Housing insecurity is operationalised using a dependent

variable of whether respondents report having fallen behind with housing payments in the twelve months preceding their Understanding Society interview.

The findings highlight a significant difference-in-differences effect of claiming Universal Credit on increasing housing insecurity in comparison to claiming the legacy Housing Benefit or Jobseeker's Allowance. The effect is more substantial for certain population groups, such as people with disabilities or claimants moving from Housing Benefit to Universal Credit. However, the effect is smaller when the analysis is applied to new claimants on a wave-by-wave basis, ensuring like-for-like comparison and better reflecting the practicalities of Universal Credit's rollout. This finding demonstrates a flaw in studies of Universal Credit that use a more general research design approach that do not sufficiently reflect the practical implementation of Universal Credit, leading to potentially overstate results that fail to highlight particularly vulnerable populations.

Chapter 2 demonstrates that the Universal Credit system has disproportionate effects on particular population groups such as people with disabilities or people who would have previously claimed Housing Benefit, placing some claimants at higher risk of experiencing housing insecurity. The reach of Universal Credit is widening, with its effects becoming increasingly engrained. As the rollout continues, vulnerable claimants who join or are already part of the Universal Credit system are therefore at risk of increased and compounding housing difficulties. Future research into the impacts of Universal Credit must therefore consider its unequal effects and expand our understanding of the populations and places at disproportionate risk of financial and housing insecurity, supporting policymakers and practitioners to better support vulnerable groups and enact policy change.

Chapter 3: Exploring spatial variation in Universal Credit's effects on housing insecurity

Chapter 3 builds on Chapter 2's exploration of how Universal Credit impacts different demographic groups by considering its area-level variation. The Universal Credit system is highly centralised, implementing policy in the same way across England and Wales despite spatial, social, and economic heterogeneity. Existing research has demonstrated high levels of spatial inequality in the UK at regional and smaller geographical levels, meaning there is a misalignment between this centralised policy approach and the wide variation in the places it affects. Chapter 3 explores the spatial variation in Universal Credit's impact and investigates particular areas in which it may have unequal or harmful effects. The research questions addressed by this study are:

- At what geographical level does variation in the effect of Universal Credit on housing insecurity occur?
- What area-level characteristics are associated with larger changes in housing insecurity following the introduction of Universal Credit?

To answer these research questions, a multilevel modelling research design is employed using geographical levels of Job Centre Districts, MSOAs and LSOAs and data from Understanding Society. As in Chapter 2, Chapter 3 employs a treatment variable of whether the respondent is claiming Universal Credit or legacy benefits, and a dependent variable of respondents' self-reported problems meeting housing payments.

Chapter 3 finds significant variation in the relationship between Universal Credit and housing insecurity across low-level geographies of MSOAs and LSOAs. Furthermore, several area-level and individual characteristics intersect with particular demographic groups to form especially vulnerable sub-populations. Particularly high MSOA-level variation in the effect of Universal Credit on housing insecurity was identified among households who would previously have claimed Child Tax Credit.

The variation in vulnerability to Universal Credit-related housing insecurity highlights the discrepancy between the one-size-fits-all policy approach of the Universal Credit system and the heterogeneity of the populations and places it serves. This generates spatially unequal impacts, with harmful effects for many households. Chapter 3 therefore recommends targeted support for especially vulnerable places and populations, increased flexibility and consideration of different populations and places into how Universal Credit is structured and implemented, and future research into the drivers behind spatial variation in Universal Credit's effects on housing insecurity, particularly at low-level geographies.

Chapter 4: The persistence of the housing insecurity effects of recent economic crises in England

The 2008 Global Financial Crisis (GFC) had substantial and long-lasting effects on UK housing markets and insecurity. These effects have not been experienced equally, with certain places and populations such as renters exhibiting higher vulnerability to post-GFC harm. Since the GFC, the UK has experienced further economic shocks with the potential to entrench the GFC's harmful economic impacts or generate additional impacts. Alongside the GFC, this study investigates the effects of the 2012 welfare reforms as a potentially

significant economic shock. While discussions around the similarities between the general economic impacts of the GFC and subsequent economic shocks are prominent, there is currently little focus on how the post-shock trajectory of housing insecurity might compare across these time periods. Comparing these periods allows us to identify similarities and differences in the impacts of past economic shocks and current or upcoming shocks, contributing to the identification of particularly vulnerable populations and potential ways in which to better support them. In particular, comparing the effects on housing insecurity provides insights into a measurable impact of economic shocks on the general population.

Chapter 4 investigates the role of housing insecurity within this wider context, exploring post-economic shock housing insecurity trajectories and how they interact with other aspects of the changing economic landscape. The research questions addressed by this study are:

- How persistent were the effects of the Global Financial Crisis on housing payment problems in England?
- How do the 2012 welfare reforms interact with the post-Global Financial Crisis housing trajectory in England?

To do this, the study applies logistic regression analysis to Understanding Society and British Household Panel Survey data from 2003 and 2022, primarily focusing on a dependent variable of whether the respondent has experienced housing payment problems in the 12 months prior to interview. This period covers the Global Financial Crisis (2008) and the UK welfare reforms (2012) as well as the years preceding and following these events. This approach allows an investigation of changes in UK housing insecurity before, during, and after significant economic crises and changes. The sample includes all working age social or private renters or mortgaged homeowners.

The findings of Chapter 4 evidence the 2008 Global Financial Crisis' substantial and persistent damaging effect on levels of housing insecurity in the UK and demonstrate that the 2012 welfare reforms were not associated with similarly extreme or long-lasting changes. Instead, this later shock interrupted the post-GFC downward housing insecurity trajectory, causing a temporary spike in housing insecurity and demonstrating the potential for economic shocks to further entrench the harmful post-GFC effects on the UK's housing landscape by disrupting or slowing its recovery. The effects of both economic shocks are not experienced equally across the population, with spatial and demographic differences in their differences. Renters (particularly social renters), households on low incomes, and people with disabilities exhibit higher vulnerability to changes in the economic and housing

landscape. This indicates that as well as affecting the overall trajectory of housing insecurity, economic shocks interact with particular populations differently and may have heterogeneous effects on their experiences of housing insecurity.

The variation in the effect of economic shocks on housing insecurity demonstrates a need for flexibility in how we research and support different populations during times of economic change or crisis. The populations identified as vulnerable in this study provide useful starting points for further research into the impacts of current and future economic shocks on housing insecurity. However, we should also expect heterogeneity in the vulnerability of places and populations in different economic contexts, making it important to carry out case-by-case research into how current and future economic shocks interact with and affect housing insecurity. The variation in how populations are impacted by economic events demonstrated in Chapter 4 must also be considered from a policy perspective and reflected in a flexible welfare system. The centralised and rigid nature of the current welfare system in England means that this need for flexibility is currently unmet, enabling unequal spatial and demographic impacts on housing insecurity and decreasing the capacity of vulnerable groups to absorb and recover from economic shocks.

Finally, in **Chapter 5** I draw together the main findings of the thesis, position them within the contexts of current UK housing policy and the wider international housing landscape, and suggest future avenues for policy and research.

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Abstract: Existing research indicates an association between the introduction of Universal Credit in the UK and increased financial hardship among claimants. This policy change embodies key changes in welfare policy and ideology taking place across Europe and worldwide. This study investigates the association between housing insecurity and claiming Universal Credit in comparison to Housing Benefit and Jobseeker's Allowance. To examine changes in housing insecurity trajectories before and after the introduction of Universal Credit, I applied a difference-in-differences fixed effects logistic regression research design to Understanding Society data (2009-2020) on benefit claimants in England. I compared how Universal Credit claimants' likelihood of housing insecurity changes over time compared to other benefit claimants. I found that claiming Universal Credit does indeed have a significant effect on increasing housing insecurity in comparison to claiming Housing Benefit or Jobseeker's Allowance. This effect varied across different scenarios, including a larger effect for people with disabilities and claimants moving from Housing Benefit to Universal Credit. These findings demonstrate that the Universal Credit system negatively impacts particular population groups more than others, placing these claimants at disproportionate risk of experiencing housing insecurity.

2.1 Introduction

The DWP's 2018 survey of Universal Credit claimants found that 36% of respondents were in housing arrears. 65% of those in arrears had gone into debt after beginning their Universal Credit claim (DWP, 2018, p16). The recent rollout of the UK's Universal Credit system is a hugely substantial and extensive welfare policy change, making a potential link between Universal Credit and increases in housing insecurity a valuable and urgent focus for research. However, while relationships between earlier welfare reform and housing outcomes are well established in the literature, with particularly strong evidence linking changes to Housing Benefit and worsening housing outcomes (Mulherin, 2019; Fitzpatrick, Mackie & Wood, 2019; Fetzer, Sen & Souza, 2019), we have fewer insights into how Universal Credit and housing interact due to its recency and long, complex rollout. DWP's own investigation into the impact of migrating from legacy benefits to Universal Credit has been paused, with its Managed Migration pilot scheme including only 69 cases by the end of 2019 (Stacey, 2020, p.57). Consequently research into the effects of Universal Credit in comparison to legacy benefits is becoming increasingly important as the policy rollout continues. The Universal Credit system is strongly associated with a number of changes in welfare policy and ideology taking place within wider European and international contexts, such as an increased focus on conditionality and national debt reduction (Koch & Reeves, 2021; Gringrich & King, 2019). Consequently the analysis of Universal Credit and its effects is valuable beyond its immediate UK context, exemplifying and providing comparison for other national welfare policy changes.

This paper makes an original contribution to the body of research on welfare reform and housing outcomes by investigating Universal Credit's effects on claimants' ability to meet housing costs in England using Understanding Society data (Waves 1 to 10, 2009-2020) (University of Essex, 2020). While existing studies have primarily considered the effects of Universal Credit from an overall rollout-wide perspective, this study reflects the complex and varied rollout of Universal Credit in its research design and results by employing multiple comparison groups and a wave-by-wave analysis. The following research questions are explored:

- What is the effect of Universal Credit on housing insecurity for claimants living in rented housing in England?
- How does housing insecurity compare or differ for Universal Credit claimants and Housing Benefit or Jobseeker's Allowance claimants?

The research questions are addressed using Understanding Society data (Waves 1 to 10, 2009-2020) (University of Essex, 2020) and supplementary administrative data. The study uses a difference-in-differences methodology, comparing housing insecurity among Universal Credit and legacy benefit claimants before and after the introduction of Universal Credit. The conceptualisations of housing insecurity employed across the existing literature are diverse, from narrow quantifiable measures such as rough sleeper counts to more abstract or multifaceted housing outcome measures that comprise different dimensions (Rhodes and Rugg, 2018, p46; Foye, 2020, p5; Clair, Reeves, McKee & Stuckler, 2019; Routhier, 2019, p236). The conceptualisation of housing insecurity employed in the present study is situated within this wider discourse, focusing particularly on housing insecurity in relation to affordability and economic hardship due to the intersection with Universal Credit. Similar affordability-based approaches have measured housing insecurity using missed housing payments (Burgard, Seefeldt & Zelner, 2012) and difficulties meeting housing payments (Pollack, Griffin & Lynch, 2010). Housing insecurity is here measured using a dependent variable of whether respondents have fallen behind with rent payments in the twelve months preceding their Understanding Society interview.

The study finds that claiming Universal Credit has a significant effect on increasing housing insecurity in comparison to claiming Housing Benefit or Jobseeker's Allowance. This effect is slightly reduced when analysis is applied to new claimants on a wave-by-wave basis rather than the whole sample across the rollout period. This indicates that analyses of Universal Credit taking a more general approach to research design elements such as time frame and sample construction are at risk of failing to sufficiently integrate the practical implementation of Universal Credit, potentially exaggerating its overall negative effects due to the influence of selection effects, as explored below. Moreover, this effect is more significant for certain population groups, such as people with self-reported disabilities or claimants moving from Housing Benefit to Universal Credit.

2.2 Literature review

2.2.1 Policy background

Universal Credit (UC) is an integrated benefit for all working age claimants, replacing a variety of legacy benefits to create one centralised system. In November 2010 the DWP recorded 4.8 million Housing Benefit (HB) claimants and 1.4 million Jobseeker's Allowance (JSA) claimants (DWP, 2010). By May 2020, the distribution of claimant numbers had changed significantly due to the introduction of UC, with 3.1 million HB claimants, 170,000 JSA claimants, and 5.4 million UC claimants, 2.4 million of whom included a housing element in their claim (DWP, 2020a). The implementation of UC began with a pilot programme in 2013 in several towns, mainly in the North of England (DWP, 2014, p7). Initial access to UC was limited to single non-homeowners without children who did not have a HB claim and were making a new JSA claim (DWP, 2014, p7; D'Este & Harvey, 2020, p.12). National expansion began in February 2015 (DWP, 2021), with UC gradually rolling out to more areas and claimant types until December 2018, when UC was available to all claimant types across Great Britain making new or changed claims (DWP, 2021). The next stage of the programme is "Managed Migration", through which existing legacy benefit claimants without a change in circumstances will be moved to the legacy benefit system. Other than a pilot programme that began in Harrogate in July 2019 (DWP, 2021), "Managed Migration" is currently not being implemented, but is projected to take place between 2023 and 2029 (DWP, 2023).

Due to the gradual rollout of UC, selection into the UC claimant group is affected by a number of entry effects. At different stages in the rollout, a claimant's allocation into the UC or legacy benefit system is affected by the date of their claim, their location, their household characteristics, and what kind of claim they are making (DWP, 2014, p11). The early inclusion of demographic groups at higher risk of housing insecurity, such as single adult households, and the requirement for claimants to be making a new or adjusted claim to enter the UC system may have a selection effect on the UC claimant group, leading to a disproportionately increased level of housing insecurity. Another key entry effect influencing the rollout was Job Centre deliverability, linked to the size and performance of job centres, the local labour markets they operate in (DWP, 2014, p14), and the ability of staff training and IT practices to support the new system (D'Este & Harvey, 2020, p.12). In order to compare the UC and legacy benefit claimant groups throughout the rollout, it is therefore necessary to allow for these entry effects and utilise similar samples. The DWP evaluation of UC's effect on employment therefore focuses on comparing similar people making new

claims to either the UC or legacy benefit system based on differences in geography or time who are claiming in similar labour markets (DWP, 2014, p14).

2.2.2 Housing insecurity and outcomes

A crucial element of housing research is defining the conceptual perimeters of housing insecurity. The definitions of housing insecurity employed across the existing literature are diverse, from narrow quantifiable measures such as rough sleeper counts to more abstract and multifaceted analyses of people's experiences (Rhodes and Rugg, 2018, p46). This conceptual variety is also entrenched in the data, illustrated by the different ways in which the UK devolved nations define and collect data on housing insecurity (GSS, 2019, p6). A particularly problematic dimension of the varied understandings of housing insecurity is the frequent isolation of area or individual characteristics, causing effects to be overstated (Johnson, Scutella, Tseng & Wood, 2019, p1090) and limited insights into the interactions between the two (Bramley and Fitzpatrick, 2018, p114). Universal Credit incorporates area characteristics due to its phased roll-out and individual characteristics due to the role of conditionality in its assignment, making both individual and area variables important to an effective conceptualisation of housing insecurity.

Evaluating housing outcomes poses a similar conceptual problem. While housing insecurity is frequently defined in the literature, less attention is paid to the parameters of housing security and what it means to exit housing insecurity. Key approaches to defining a wider spectrum of housing outcomes have been set forward by Cobb-Clark, Herault, Scutella and Tseng (2016) and Foye (2020). Cobb-Clark and colleagues conceptualise housing outcomes as a series of categories ranging from "literal homelessness", encapsulating rough sleeping or emergency accommodation, through to being "housed" (Cobb-Clark et al., 2016, p60). In order to apply this concept empirically, the authors consider people to have exited homelessness or housing insecurity if they have been out of these categories for ten days. This approach is likely to miss less extreme housing insecurity, as people often move in and out of insecure housing situations rather than exiting them completely (Cobb-Clark et al., 2016, p60), and experience housing insecurity even when housed, such as when struggling to afford housing payments or living in unsuitable housing. Foye's approach attempts to capture a broader dimensionality of housing outcomes by incorporating more granular measures of people's housing situations, including variables such as overcrowding and compliance with the UK Government's Decent Homes Standard (Foye, 2020, p5). As well as these objective measures, Foye considers "capability measures" evaluating people's life satisfaction and opportunities (Foye, 2020, p13). While Foye's approach provides a more

expansive understanding of housing outcomes than Cobb-Clark and colleagues, it is more difficult to effectively measure and operationalise in research. The present study measures housing insecurity using a dependent variable of whether survey respondents have fallen behind with housing payments in the twelve months preceding their interview.

Individual- and area-level factors influencing the likelihood of housing insecurity are a predominant focus of much housing-related literature. Bramley and Fitzpatrick's (2018) recent analysis of which UK population groups are most at risk of housing insecurity provides a particularly thorough insight into what characteristics are likely to be influential. Demographic associations highlighted by the study were in line with the preceding body of evidence, including older adults and multi-adult households linked with lower risk of housing insecurity, and lone parents and people with disabilities linked with higher risk (Bramley & Fitzpatrick, 2018, p103). Area-level contexts such as local employment rates, housing markets, and tenure distribution were found to have a lesser but still significant effect on housing insecurity in comparison to individual characteristics (Bramley & Fitzpatrick, 2018, p104, p113). However, the area-level effects may be understated due to the use of micro-level data analysis employed in the study (Bramley & Fitzpatrick, 2018, p113) and the absence of interaction effects in the model (p114) investigating the correspondence between individual and area-level factors. O'Flaherty (2004) emphasises the significance of this individual-area interaction, asserting that individual demographic characteristics make people vulnerable to particular area conditions rather than acting individually to increase the risk of housing insecurity.

2.2.3 Welfare reform and its effects

The relationship between changes in welfare policy and housing insecurity is well established in the literature. Mulheirn's analysis of the relationship between housing insecurity and supply (2019) attributes the unequal distribution of housing insecurity to cuts in Housing Benefit (HB) provision, decreased access to social housing, and a consequent increase in overall housing costs (p37). Mulheirn finds that these affordability and access issues have a particularly significant impact on 20-to-34 year olds (p29). Similarly, Fitzpatrick, Mackie and Wood's 2019 policy briefing on homelessness prevention associates reductions in housing allowances with a failed approach to universal homelessness prevention, linking housing welfare changes directly to adverse housing outcomes in the UK including increases in private rental evictions and experiences of homelessness (p3).

Empirical work on this relationship includes Fetzer, Sen and Souza's investigation (2019) into the impact of the 2011 Housing Benefit reforms, which changed the local reference rent rates used to calculate HB from the median level to up the 30th percentile, resulting in lower awards. This study employed several conceptualisations of housing insecure outcomes, including evictions, temporary accommodation, and rough sleeping. It uses a difference in differences methodology to evaluate the spatial distribution of the policy change's impact, incorporating broader local effects such as reduced funding for other services to cover an increased cost in housing support services (p29). The results of the study indicated significant associations between the policy change and a 22.1% increase in evictions (p21), a 17.8% increase in demand on temporary accommodation (p23), and a 36.7% increase in rough sleeping (p24), all diverging from pre-reform trajectories. The established evidence base demonstrating the effects of policy changes on housing outcomes provides a foundation for further investigations into more recent welfare reforms.

2.3.3 Universal Credit and its effects

UC differs from previous UK welfare policy in several ways. It is an integrated benefit, replacing a variety of previously separate legacy benefits and requiring system migration on a massive scale. It incorporates several practical changes in how benefits are implemented, delivered, and accessed by claimants. Crucially, UC can be seen as an ideological shift in the UK welfare system, centred around intended behaviour change in claimants (Hickman, Kemp, Reeve & Wilson, 2017, p1110). Koch and Reeves (2021) assert that the UC welfare reform realligns the purpose of the welfare system from social security to active citizenship, focused around activating claimants to enter employment (p7). They argue that this ideological shift results in the state taking part in creating risk and insecurity, with inbuilt insecurity acting to encourage claimants towards active citizenship (Koch & Reeves, 2021, p3). In particular, an increase in conditionality and sanctioning may be intended to compel claimants to better their financial situation through work (Reeves and Loopstra, 2020, p3). This ideological motivation conflicts with the reality of high rates of in-work poverty and benefit claims in the UK, creating a misalignment between the aims and values of current welfare policy and the needs and circumstances of the people it affects.

The introduction of UC is situated within a wider global context of changes in housing affordability, with a current strong association between poverty and housing cost overburden across European nations (Hick, Pomati & Stephens, 2022, p26), and welfare policies. Gingrich and King (2019) position UC as part of "a blurring of differences across the American and European welfare states" (p89), through which European states have adopted

increasingly narrow and conditional benefit systems. This shift is particularly associated with the response to the 2008/2009 Global Financial Crisis, which focused on the reduction of spending and government debt in many European countries (Koch & Reeves, 2021, p4). UC can be viewed as a significant manifestation or "accelerat[ion]" (Gringrich & King, 2019, p90) of this wider change in policy and ideology taking place on the international stage.

Existing research into the UC welfare reform and its effects frequently finds associations between UC and increased financial insecurity. Cheetham, Moffatt and Addison's interview-based study into the experiences of UC claimants (2018) found that financially vulnerable households who moved onto the UC system were often pushed into financial "hardship and crisis", particularly for more at-risk claimants such as disabled people or lone parents (p37). Foster and colleagues' survey of UC claimants on behalf of the DWP found that 36% of respondents were in housing arrears, and 65% of those in arrears had gone into debt after claiming UC (DWP, 2018, p16). Reeves and Loopstra's analysis of food bank usage and UC identified a significant and persistent association between the rollout of UC and a rising food bank use (2020, p17). Although Reeves and Loopstra note that it is not possible to distinguish how each feature of UC affects hardship in their study (p17), they strongly emphasise the role of conditionality (p18).

While conditionality is not a new characteristic of welfare policy in the UK, it has become increasingly prominent in recent welfare reform (Preece, Hickman & Pattison, 2020, p1216), with the introduction of UC notably applying new conditionality measures to in-work claimants. The change in conditionality is most apparent in the changes in sanctioning, a measure by which benefit payments are reduced for a set period of time in response to a claimant failing to meet required claimant responsibilities. Sanctioning is a feature of both the legacy and UC systems, with studies showing links between experiences of sanctioning in the legacy system and increased financial hardship. A UK-wide quantitative study on JSA claimants by Loopstra, Fledderjohann, Reeves and Stuckler (2018) found a significant association between increases in sanctioning rates and increases in food bank usage. Adler (2018) asserts that the UC system has a higher sanctioning rate than the legacy system, estimating that in 2019 JSA claimants had a sanctioning rate of 0.5% while UC claimants had a sanctioning rate of around 3%. Furthermore, unlike in the legacy system, these sanctions can now be deducted from the housing element of UC (Reeves & Loopstra, 2020, p3). A qualitative longitudinal study by Dwyer (2018) into the experiences of UC claimants identifies perceived links between receiving sanctions and going into debt and rent arrears (p7). There is therefore potentially an increase in levels of conditionality, particularly through

sanctioning, in the UC system, connected with a higher risk of negative financial and housing outcomes.

Several other mechanical features of UC's implementation can be associated with increased risk of financial hardship. There is a waiting period of at least 5 weeks between the acceptance of a claim and the first payment, intended to replicate monthly payment schedules in the world of work. Claimants' experiences indicate that this payment gap can cause financial hardship, including going into debt (Reeves & Loopstra, 2020, p3; Stacey, 2020, p30). Although advance payments are possible, these payments are then automatically deducted from future UC payments, simply deferring the financial hardship (Reeves & Loopstra, 2020, p4). UC is a fully digitised system, resulting in difficulties for many claimants due to limited access to computers or the internet (DWP, 2018, p13), potentially leading to reduced access and increased sanctioning due to missed information for more vulnerable claimants.

Most crucially for housing outcomes, the UC system by default directly pays its housing element to claimants rather than landlords. Analysis of the DWP 2012-13 trial of direct payment demonstrated a negative impact on rent payments, with rent underpayment increasing by 5.5% upon the introduction of direct payment, settling to a 2% increase as claimants became more used to the new system (Wilson, 2019, p579). This underpayment was found across all demographics and household types, and was primarily caused by financial precarcity (Hickman, Kemp, Reeve & Wilson, 2017, p.1116). Hickman asserts that insights drawn from the direct payment trial are likely to also apply to UC claimants' rent behaviour (Hickman, 2021, p237), increasing the likelihood of UC claimants going into rent arrears. As well as direct payment, UC is paid monthly by default, whereas legacy benefits were often paid on a weekly or fortnightly basis. Hartfree identifies the monthly payment system as increasing the risk of financial hardship, as it is misaligned with low-income households' existing budgeting behaviours (Hartfree, 2014, p17).

2.3.4 Universal Credit and Disabled Claimants

A report by Becca Stacey for homelessness and poverty charity Z2K emphasises the impact of UC on claimants with a limited capability for work due to disability (Stacey, 2020, p23). This qualitative research draws on 15 interviews with Z2K clients about their experiences of claiming UC (Stacey, 2020, p2). The report highlights elements of UC that negatively impact claimants with a limited capability for work, including a minimum wait of three months after the UC claim starts for a Work Capability Assessment (Stacey, 2020, p17) and lengthy

reconsideration and appeals processes during which claimants “receive the same level of financial support and are subject to the same work related requirements as someone who is able to work” (p18). Furthermore, changes in sanctioning under Universal Credit have led to an increase in the sanctioning rate among the disabled population (Reeves & Loopstra, 2017, p7), placing further financial strain on disabled claimants. A study into the experiences of Universal Credit claimants in Gateshead and Newcastle associates the transition to Universal Credit with increased risk of rent arrears (Cheetham, Moffatt & Addison, 2018, p17), finding that it is “particularly challenging for people with health issues and disabilities” (p34).

A disproportionate effect on claimants with a limited capability for work is further demonstrated by the Institute for Fiscal Studies’ quantitative research into the impact of UC on household incomes, which finds that 22% of claimants with disabilities received at least £1,000 p.a. Less when claiming UC rather than legacy benefits, in comparison to 14% of claimants without disabilities (Brewer, Joyce, Waters & Woods, 2019, p.15). In line with Z2K’s observations, the IFS associates this disproportionate impact with the limited capability for work for many disabled claimants (Brewer, Joyce, Waters & Woods, 2019, p.15). While the premise for this reduction is that disability-related costs will instead be “picked up through the social care system” (HC Deb 16 Dec 2015 UIN 20446), research indicates that in practice disabled people often have higher personal living costs to meet disability and care needs (Fallon & Price, 2020, p249). The upcoming Managed Migration stage of UC will require a large number of disabled legacy benefits claimants to transition to the UC system (Stacey, 2020, p6). Further research into the relationship between UC and housing outcomes for disabled claimants is therefore of particular importance, as there is potential for a more significant impact that will affect more households as Managed Migration takes place.

2.3.5 Analysing Universal Credit

In contrast to previous welfare policy changes, Universal Credit’s (UC) staggered rollout introduces an element of selection randomness that provides a foundation for causal inference. Adoption of UC across local authorities was implemented primarily based on “administrative reasons” (D’Este & Harvey, 2020, p10), resulting in a “quasi-experimental variation” in benefit claimants receiving UC or legacy benefits (p16). Several recent studies have exploited the randomised nature of the rollout. Hardie’s (2020) investigation into the effects of UC on private rental repossession rates uses a fixed-effects panel design with explanatory variables of the extent and duration of the UC rollout in a local authority. Hardie’s

findings suggest a higher rate of landlord repossessions in areas where UC was fully rolled out, with this impact increasing the longer UC has been in effect. Similarly, D'Este & Harvey (2020) use constituency-level data on UC rollout and levels of crime for a difference in differences analysis of UC's effect on crime rate, comparing constituencies at different stages of UC rollout. The fully spatial approach employed in both studies is limited, as it does not account for claimant variance within local authorities - legacy benefit claimants are not automatically transferred to UC, meaning an area is likely to have a mix of both claimant types.

In order to incorporate individual as well as area characteristics, other studies have implemented a matching and comparison approach, as in Wickham and colleagues' (2020) difference in differences analysis of UC's effect on mental health. This paper uses Understanding Society data to incorporate location (Local Authority) and individual (employment and psychological status) data. The study notes that when constructing intervention and comparison groups, pre-intervention trends were examined using regression and visualisation in order to identify parallel trends, providing a foundation for causal inference (Wickham et al, 2020, p160). However, the construction of the intervention and comparison groups is limited as it does not fully reflect the practical nature of the UC rollout. Alongside the local UC rollout status, Wickham and colleagues use employment status as a determining factor for UC eligibility and therefore group assignment. As UC has both in-work and out-of-work components, this is a limiting approach, and potentially reflects more on the effect of employment status than UC. A disconnect between the practical characteristics of UC's implementation and how its effects are analysed are evidently a key limitation in the current literature.

2.3.6 Methodological considerations

As a relatively recent policy change, research into the effects of UC has been limited by data availability. While the rollout of UC was initially implemented in pilot areas, subsequent changes in the substance of the policy as well as the wider economic context restricts the usefulness of examining these areas (Hickman, Kemp, Reeve & Wilson, 2017, p1109). Studies such as Reed's (2019) random effects analysis of individual factors affecting housing insecurity among UC claimants have therefore drawn on longitudinal panel data, including Understanding Society, to gain an understanding of UC's effect across the UK. Reed's paper finds an increased probability of UC claimants experiencing housing insecurity in comparison to claimants of legacy benefits or no benefits (Reed, 2019, p45), identifying a relationship worthy of further investigation. Reed (2019) also notes that future investigations into similar

research questions would benefit from incorporating different waves of Understanding Society data and time-varying and time-constant characteristics (p64). The limited insights into UC's effects over time is a weakness of the wider literature, with a current reliance on cross-sectional data (Hardie, 2020, p7) and a potential overstatement of short-term effects (Wilson, 2019, p583).

Although the data foundation of research into UC and its effects can be made more robust, it is crucial to acknowledge that some level of uncertainty is inherent when evaluating housing insecurity. The most extreme forms of housing insecurity such as rough sleeping are impossible to fully accurately measure due to the transience and social exclusion of these populations, and are by definition uncaptured by household surveys. Prentice and Scutella's (2019) study of the effects of living in social housing in Australia highlights the effect of unobservable systematic differences when applying matching and causal inference methods to housing insecurity research (p627). Prentice and Scutella address this using difference in differences methodology, analysing differences in outcome changes rather than the changes themselves in order to reduce the impact of unobservable characteristics "associated with different cohorts" and "different periods of time" spent in social housing (p628). Glynn and Fox (2019) also address the inherent uncertainty in measuring housing insecurity in their analysis of homelessness trends in the USA by incorporating both homelessness counts and estimations of "the true size of the homeless population", using the different bounds to investigate how different levels of count accuracy affect our understanding of changes in homelessness rates (p2). While this is a relatively underexplored element of housing research, incorporating an approach to uncertainty and unmeasurable factors into research design is a significant element of building a robust exploration of housing insecurity.

2.3.7 This study's contribution

The current study responds to ongoing discussions around defining housing insecurity by taking a combined area and individual level conceptual position, driven by the area and individual level elements of UC's conditionality and roll-out. The study's approach to measuring housing insecurity is positioned within a broad quantitative approach, using a dependent variable of whether survey respondents have fallen behind with housing payments in the twelve months preceding their interview to capture a widely-affecting rather than extreme form of housing insecurity. The paper responds to a strong research tradition of linking welfare policy change and housing effects, making an original contribution to this evidence base by incorporating the complex staggered rollout of UC in its methodology. In doing so, the study contributes to a key research gap currently under investigation by the

housing and policy research community: what is the effect of Universal Credit on its claimants' housing insecurity, and how does this differ to the experiences of legacy benefit claimants?

2.3 Data and methods

2.3.1 Data

Understanding Society is a longitudinal household panel study, collecting annual survey data on the experiences of UK residents on a wide range of social and political topics (University of Essex, 2020). The survey data includes participants' experiences of both housing and welfare, enabling the relationship between the two to be analysed on an individual level. The data currently covers observations from 2009 to 2020. Understanding Society provides a sample that is both large, with 50110 respondents in Wave 10, and representative due to the inclusion of Ethnic Minority and Immigrant Boost samples. It is therefore a robust and generalisable foundation for research into the UK population. As the data can be accessed at regional, Local Authority and LSOA level, Understanding Society also enables both individual and area-level analysis. This is especially important for research into housing outcomes and their causes due to the significance of the interaction between individual and local variables.

The current analyses focus on respondents in England who are living in rented housing and are eligible for or claiming UC. Included respondents (n=7787 individuals) were those living in social or private rental housing, between the ages of 18 and 65 (as UC is a working age benefit), and who claimed UC, HB or JSA at some point during the data collection period. The data is analysed at a person-year unit level, with each individual measured up to 10 times in the sample.

The analysis was performed using three sample groups of Understanding Society data. The treatment group (claimants who entered the new UC system through a new claim or migration from legacy benefits) consists of all private or social renters of working age claiming UC (n=706 individuals). The control groups (claimants who remained on the legacy system) consist of all private or social renters of working age claiming HB (n=6783 individuals) or JSA (n=1031 individuals). Two benefit groups were selected as UC is intended to replace a wide range of legacy benefits, with different benefits being incorporated into the UC rollout at different times. Despite merging into one system under UC, HB and JSA claimants in the legacy system frequently have different demographic distributions, such as the JSA claimant group skewing younger than the HB group. In comparison to other legacy benefits, JSA is especially widely applicable to the working age population, who are also the target group of UC. By stratifying the analysis across these two comparison groups, the study therefore better reflects the practical implementation of UC

and how it affects different population groups. While complete like-for-like comparison is not feasible, this enables us to compare UC claimants to a broad and diverse sample of legacy benefit claimants. HB and JSA are not mutually exclusive under the legacy benefit system, meaning there may be some overlap between these groups. As respondents' personal identifier codes remain the same across waves, claimants' experiences of housing insecurity prior to claiming UC or HB/JSA can also be included in the analysis. This enables comparison between claimants' pre- and post-claim housing insecurity, enabling us to identify whether change occurs. For year-by-year analysis, these sample groups are further categorised by the year in which the respondent's claim began.

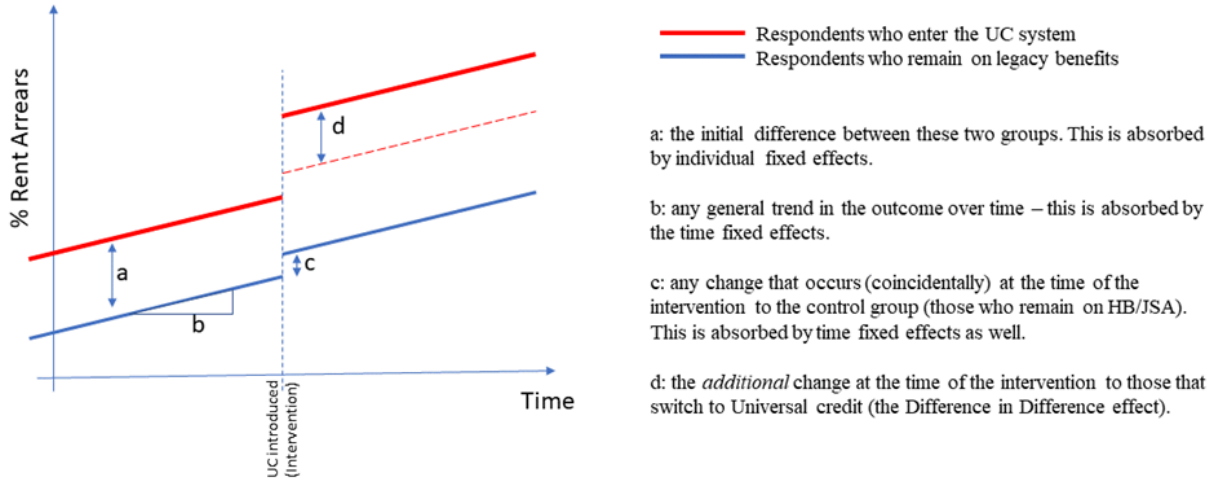
2.3.2 Methods

The complex policy rollout and longitudinal data under investigation in this study provide a robust rationale for a difference-in-differences (DID) research design. Angrist and Pischke (2009) observe that DID is effective when researching policies that feature a range of possibilities that differ across areas or time periods (p234). This corresponds with the varied welfare options in the UK, including an array of legacy benefits as well as UC, and the gradual rollout of UC across different geographical areas over time. DID is also particularly effective when applied to a multi-year sample such as Understanding Society in identifying "whether causes happen before consequences" (Angrist & Pischke, 2009, p237). This is valuable in avoiding misinterpretations of reverse causality, contributing to a more robust and reliable causal research design.

A DID research design is therefore implemented in this study, with a treatment variable of claiming UC or legacy benefits and a dependent variable of problems meeting rental payments. As the UC treatment applies only to post-rollout data, this introduces a before-after element to the treatment, making it equivalent to a difference-in-differences effect. The research design diagram (Figure 2.1) further illustrates the composition of this DID effect, consisting of the additional change in housing insecurity at the time of the intervention for respondents who enter the UC system. This is a panel model in which initial differences between groups and general trends in the housing insecurity trajectory, including coincidental change in the control group at the time of intervention, are absorbed by the time and individual fixed effects. The analysis focuses on the difference between changes in claimants' ability to meet housing payments across Understanding Society waves. This is indicated by a binary measure of whether respondents have fallen behind with housing payments in the twelve months preceding their Understanding Society interview. The analysis is stratified across two samples: a JSA/UC group, and an HB/UC group. Due to the binary dependent variable, a logistic regression fixed effects model has been employed,

using the conditional logistic regression function from the 'Survival' package in R (Therneau, 2022). The model includes individual respondents and data collection waves as fixed effects to control for unobserved heterogeneity, isolating UC's effects by accounting for differences between groups. The resulting regression table demonstrates the effect of each included variable on the likelihood of a claimant experiencing problems meeting housing payments.

Figure 2.1 - Diagram of difference in differences research design, comparing housing insecurity trajectories of counterfactual and treatment groups (does not depict real data)



Explanatory variables were selected based on existing research into factors influencing housing insecurity, with individual variables derived from Bramley and Fitzpatrick (2018). The independent variables included in the model are: UC treatment status, benefit claimed, benefit income amount, tenure type, employment status, age bracket, sex, health status, whether the respondent is responsible for a child under 16, how many children live in the household, whether the respondent is single or living with a partner in household, and the Access to Housing and Services IMD decile (by local authority). Wave and individual fixed effects were also included.

2.4 Results

2.4.1 Trajectory visualisation: comparing housing insecurity between different claimant groups

In order for a difference-in-differences analysis to be effective, the treatment and control groups require a parallel trajectory prior to intervention, ensuring that the analysis compares like for like. This would indicate that claimants had similar experiences of housing insecurity before breaking into the UC and legacy benefit system groups, meaning that any change in housing insecurity following that divergence could be associated with differing benefit claims. By comparing the proportion of UC and legacy benefit claimants experiencing difficulties meeting rent payments before and throughout the rollout of UC, we can identify whether a parallel trajectory is present.

Figure 2.2 - Proportion of UC, HB, and JSA claimants experiencing housing payment difficulties between Wave 1 and Wave 10

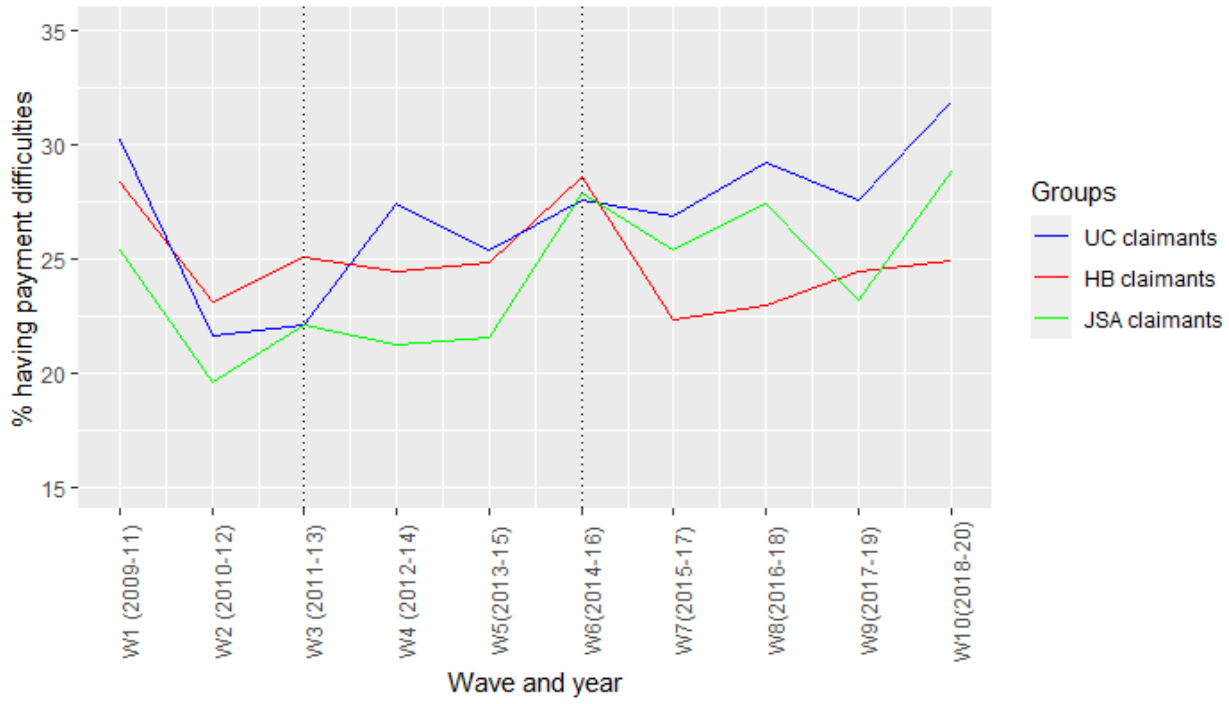


Figure 2.2 demonstrates the presence of parallel trajectories between the UC and HB groups prior to the first introduction of UC in Wave 3 (2013). During this period the groups have a relatively consistent difference of around 5 percentage points. As a difference-in-differences approach focuses on the differences between the changes in the trajectories rather than the differences between the trajectories themselves, this initial gap does not significantly impact the results.

Between Waves 3 and 6 UC was gradually rolled out in different areas of the UK before a full UK-wide rollout in Wave 6 (2014-16). A sharp difference between the trajectories of the treatment and control groups can be seen at the time of the wider UC rollout, with a higher proportion of the UC claimant group experiencing difficulties meeting rent payments than the HB claimant group. In conjunction with the initial parallel trajectories, this notable diversion provides a strong foundation for a difference-in-differences approach.

The housing insecurity trajectory for JSA claimants is more volatile than that of HB claimants, with a less distinct correspondence with the UC claimant group trajectory. The different levels of volatility reflect the different claimant population make-ups, with the HB population including more long-term and older claimants compared to more short-term and younger JSA claimants. Both the UC and JSA groups follow an overall upward trajectory, with the UC group more consistently surpassing the JSA group in Waves 6-10 following the wider rollout of UC. This visualisation indicates a similarly volatile and worsening housing insecurity experience among UC and JSA claimants, with a less defined divergence than the HB group at an overall level.

A distinct spike in housing insecurity for both the JSA and HB groups occurs in Wave 6. This spike is consistent across all samples employed in this study, and follows the introduction in 2013 of several welfare reforms including the Benefit Cap, an upper limit on the total amount a household can claim in benefits administered through HB or UC. This anomaly can therefore likely be attributed to the financial shock experienced by many claimants following these changes, particularly in association with a subsequent spike in the sanctioning rate in 2014 (Webster, 2014). All claimant groups experience a significant drop in housing insecurity between Waves 1 and 2. This is likely to reflect wider economic recovery in the UK following the 2007- 2008 Global Financial Crisis.

2.4.2 Fixed effects logistic regression modelling

Fixed effects logistic regression modelling was employed to investigate variable effects on housing insecurity, including a treatment variable of whether the claimant is claiming UC. This approach improves on the trajectory visualisation by moving from examining average aggregate effects to individual effects. The model was stratified across the JSA and HB claimant groups. The resulting regression tables demonstrate the effect of each variable on the probability of a claimant experiencing problems meeting housing payments.

In both models, the treatment effect is positive and significant, indicating that claiming UC in comparison to HB or JSA is associated with an increased likelihood of experiencing housing

insecurity over time. The HB model found that claiming UC was associated with a 1.9 log odds of experiencing housing insecurity across the data collection period in comparison to the control group, and the JSA model found that claiming UC was associated with a 1.55 log odds (Table 2.1). In both cases, claiming UC was linked to higher odds of experiencing housing insecurity when compared to the legacy benefit system. The treatment effect is larger in the HB model, in line with the trajectory visualisation (Figure 2.2).

Table 2.1. Regression table for whole sample fixed effects logistic regression models.

	UC/HB group comparison model					UC/JSA group comparison model				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.64	0.09	0.0001	1.89	***	0.44	0.12	0.0002	1.55	***
Benefit: JSA	-0.11	0.15	0.48	0.90		0.23	0.11	0.04	1.26	*
Benefit: HB	0.05	0.04	0.19	1.06		0.01	0.10	0.89	1.01	
Benefit income	-0.0001	0.00003	0.0001	1.00	***	-0.0002	0.0001	0.004	1.00	*
Age: 21-34	0.05	0.15	0.75	1.05		0.05	0.16	0.73	1.05	
Age: 25-34	0.26	0.17	0.14	1.29		0.22	0.21	0.30	1.24	
Age: 35-44	0.40	0.20	0.05	1.49	*	0.30	0.30	0.33	1.35	
Age: 45-54	0.50	0.23	0.03	1.65	*	0.29	0.39	0.45	1.34	
Age: 55-64	0.59	0.26	0.03	1.80	*	0.50	0.48	0.29	1.65	
Employed	0.21	0.05	0.00001	1.24	***	0.10	0.09	0.26	1.11	
Disability	0.19	0.05	0.0001	1.20	***	0.10	0.09	0.25	1.11	
Children in HH	-0.06	0.08	0.43	0.94		0.01	0.16	0.95	1.01	
No. of children	0.03	0.03	0.26	1.04		0.10	0.06	0.09	1.11	
Single in HH	-0.08	0.07	0.21	0.92		-0.23	0.13	0.07	0.79	
Private tenure	-0.11	0.07	0.10	0.90		-0.04	0.12	0.72	0.96	
Housing decile	0.004	0.09	0.96	1.00		-0.05	0.17	0.79	0.95	
Wave 2	-0.28	0.06	0.0001	0.76	***	-0.38	0.13	0.004	0.69	*
Wave 3	-0.19	0.06	0.002	0.83	**	-0.37	0.13	0.01	0.69	*
Wave 4	-0.18	0.07	0.01	0.84	**	-0.10	0.14	0.50	0.91	

Wave 5	-0.20	0.07	0.002	0.82	**	-0.26	0.14	0.07	0.77	
Wave 6	-0.03	0.07	0.65	0.97		-0.06	0.14	0.68	0.94	
Wave 7	-0.41	0.07	0.0001	0.66	***	-0.02	0.15	0.91	0.98	
Wave 8	-0.42	0.08	0.0001	0.66	***	-0.02	0.16	0.90	0.98	
Wave 9	-0.40	0.08	0.0001	0.67	***	-0.24	0.17	0.17	0.79	
Wave 10	-0.34	0.09	0.0002	0.71	***	-0.01	0.19	0.96	0.99	

***: <0.001, **: <0.01, *: <0.05

Several individual-level characteristics were found to be significant when comparing housing insecurity among HB and UC claimants. In the HB model (Table 2.1), being in employment is associated with a significant 6.2% reduction in the likelihood of experiencing housing insecurity. Having a disability or long-term health condition is associated with a significant 2.7% increase in the likelihood of experiencing housing insecurity. Individual-level characteristics were found to be less significant when comparing JSA and UC claimants. Additional models were generated including regions and regional characteristics of employment rates and housing affordability (Appendices 7-8). The regional HB model did not identify any of the regions or regional characteristics as significant. The regional JSA model produced similar findings, with the exception of a significant association between the North East of England and higher likelihood of experiencing housing insecurity. Both regional models produced a similar DID effect to the initial models.

2.4.3 New claimants

Compared to continuous claimants, respondents making new benefit claims are inherently more likely to have experienced new recent problems regarding their financial or housing situation, leading them to make a claim. Due to the current need for a new or changed claim in order to claim UC, there is therefore a potential for a selection effect causing higher financial or housing instability in the UC sample compared to continuous legacy benefit claimants. In order to address this, the analyses were repeated on new claimants only, enabling a more like-for-like comparison between UC and legacy benefit claimants.

The same logistic fixed effects model as employed in Section 2.4.2 was applied to the subsample of new claimants across the entire data collection period. In both models, the treatment effect of claiming UC on housing insecurity is similar but slightly reduced when considering only new claimants. In the HB new claimant model claiming UC is associated with 1.81 log odds of experiencing housing insecurity across the data collection period in

comparison to the control group, with log odds of 1.41 in the JSA new claimant model (Appendix 1).

2.4.4 Wave-by-wave analysis

In order to further ensure like-for-like comparison and isolate the treatment effect, the logistic regression model was stratified across groups of new claimants by wave. By directly comparing respondents who newly claimed each benefit in the same data collection year as one another, this version of the model aims to reduce the influence of effects associated with particular years that would impact all claimants. While not sufficiently robust individually due to small sample sizes, the wave-by-wave analyses are valuable when considered in relation to one another and the overall models (Sections 2.4.2 and 2.4.3).

The HB wave-by-wave models (Appendices 2-5) demonstrate similar results to the overall models, with significant treatment effects of claiming UC on housing insecurity across almost all waves. The relationships between being in employment, having a disability or long-term health condition, or receiving a lower benefit award and higher likelihood of housing insecurity are also mostly consistent. However, in the JSA wave-by-wave models (Appendices 2-6), a significant treatment effect is apparent in only the Wave 7 and 9 iterations. A consistent association between a larger number of children living in the household and increased housing insecurity risk is found across all waves in the JSA model.

In both the HB and JSA models, a heightened treatment effect is apparent in the Wave 7 iteration, with log odds of 3.8 in the HB model and 2.9 in the JSA model (Appendix 3). This follows the wider national rollout of UC in Wave 6 (2014-16) and the Wave 6 spike in housing insecurity (Figure 2.2), which may be associated with the introduction of several welfare reforms in 2013 and the associated financial shock experienced by many claimants. This spike potentially slightly inflates the overall treatment effect when considered across the data collection period rather than on a wave-by-wave perspective.

2.4.5 Claimants with disabilities and long term health conditions

The fixed effects logistic regression models frequently indicate a significant association between higher likelihood of housing insecurity and having a disability or long term health condition, particularly in models comparing UC and HB claimants. The connection between housing difficulties and disability is established in existing studies, as set out in Section 2.4. In order to further analyse this association, the sample of new claimants was divided into sub-samples of claimants with or without a self-reported disability or long term health

condition. The trajectories of the proportion of disabled and non-disabled claimants in all three benefit groups experiencing housing instability were visualised.

Both the UC (Figure 2.3) and JSA (Figure 2.5) visualisations indicate similar levels of housing insecurity for disabled and non-disabled claimants pre-nationwide UC rollout, with a notable increase in housing insecurity among disabled claimants compared to non-disabled claimants post-rollout. By contrast, housing insecurity is consistently lower for disabled HB claimants (Figure 2.4) compared to disabled UC and JSA claimants, with more similarity between the housing insecurity trajectories of disabled and non-disabled HB claimants.

Figure 2.3 - Housing instability trajectories of new UC claimants by disability status

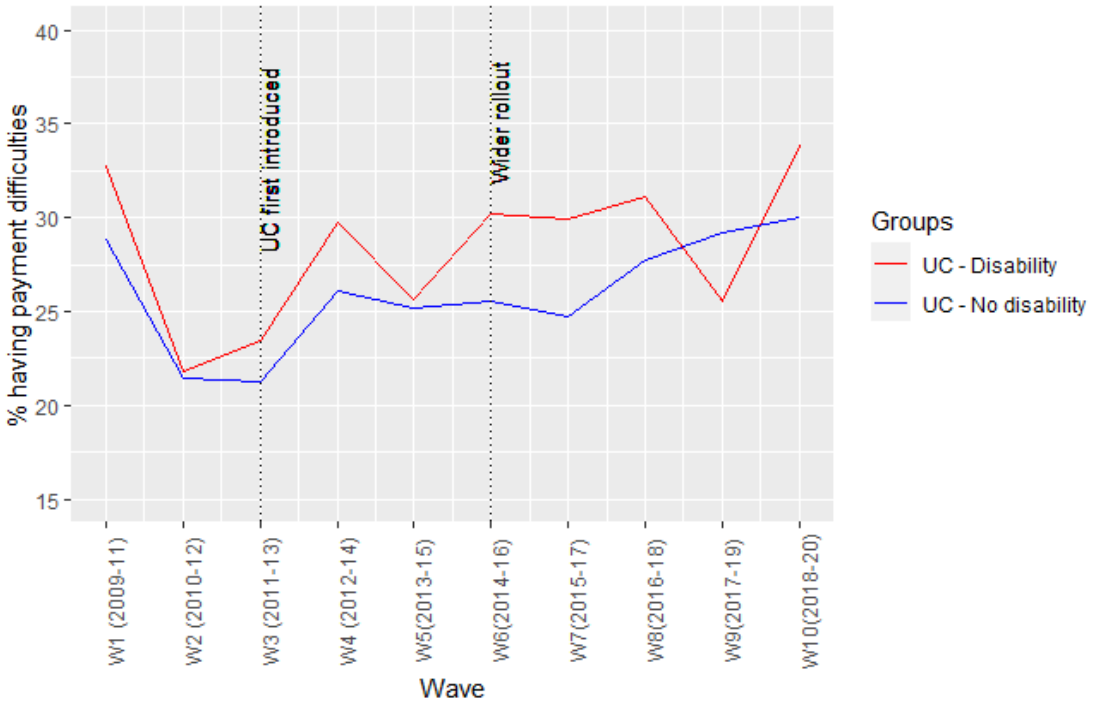


Figure 2.4 Housing instability trajectories of new HB claimants by disability status

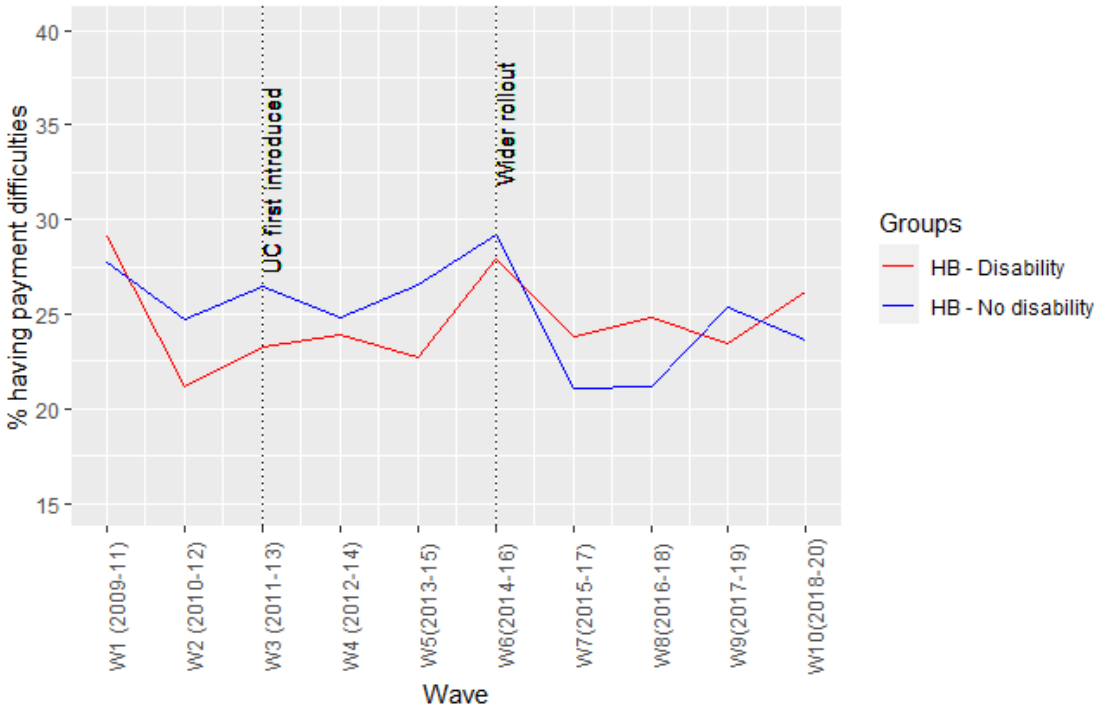


Figure 2.5 Housing instability trajectories of new JSA claimants by disability status

2.4.6 Matched samples

The analysis was repeated on matched samples of the original treatment and comparison groups as a model sensitivity check. The data was matched using the R 'Matching' package (Ho, Imai, King & Stuart, 2011) based on similar individual characteristics. Individual characteristics identified as significant in the unmatched models were used for matching. These were tenure type, employment status, and health condition, as well as the data collection wave and treatment status. The fixed effects logistic regression model (Section 2.5.2) was then run on the matched data. This data transformation enables further like-for-like comparison between the different benefit groups**.**

The overall regression results indicate a significant difference in differences effect for both models (Appendices 9-10). The matched HB model DID effect had an odds ratio of 7.8 (compared to 10.1 in the unmatched model), and the matched JSA model DID effect had an odds ratio of 8.61 (compared to 7.17 in the unmatched model). This supports the findings of the unmatched models.

2.5 Discussion

Overall analysis of housing payment difficulties among UC and legacy benefit claimants suggests that claiming UC has a significant negative effect on housing security, increasing the proportion of UC claimants experiencing housing payment difficulties in comparison to those claiming HB or JSA, with large treatment effects and distinct divergences in the post-UC rollout trajectories of claimants' housing insecurity. In the overall analysis, claiming Universal Credit was associated with a log odds of 1.9, or a 90% likelihood increase, when compared to the HB control group, and a log odds of 1.55, or a 55% likelihood increase, when compared to the JSA control group. However, studying the full sample can produce a variety of selection effects introduced by UC's gradual and selective rollout. In order to obtain insights that better reflect the practical reality of UC's implementation, this paper has therefore stratified its analysis over several sub-samples and by wave.

The treatment effect is reduced when the analysis is focused on only new claimants. It reduces further for usual years (i.e. excluding the financial insecurity spike in Wave 6) when analysis is conducted on a wave-by-wave basis. This version of the model provides a more like-by-like comparison of similar claimants and identifies wave-specific effects, generating a treatment effect that further isolates the specific influence of UC at a particular point in time. Even when year-specific effects and selection effects are further reduced, a large and significant treatment effect remains. These results demonstrate an association between claiming UC and increased experiences of housing insecurity over time in comparison to the legacy benefit system. This association corresponds with existing analysis of UC and its effects, with the increasing effect over time aligning with Hardie's findings on the increasing impact on landlord repossessions when UC had been in effect for a longer time (Hardie, 2020, p238).

The analysis indicates that the association between UC and housing outcomes varies for different groups of claimants. UC is an integrated benefit system, replacing several legacy benefits which previously served populations with differing needs and demographic make-ups. The housing insecurity trajectories of UC and JSA claimants are fairly similar, with smaller treatment effects than the HB models. By contrast, the housing insecurity trajectories of UC and HB claimants noticeably diverge and several waves experience large and significant treatment effects, associating claiming UC with an increased risk of housing insecurity over time. As recipients of different benefit types migrate to the Universal Credit system, particular subgroups such as HB recipients may therefore experience more change and insecurity in their housing situations than other groups.

As in previous studies, the analysis found individual characteristics explained a significant amount of the variance in housing insecurity, and that the risk of housing payment difficulties was distributed unequally across those individual characteristics. Individual characteristics were especially significant in the HB model, indicating that an interaction between having a vulnerable individual characteristic and being part of the HB comparison group might have a particularly strong effect on a respondents' risk of housing insecurity. In the HB model, being in employment or having a disability or health condition were associated with higher risk of housing insecurity, while the wave-by-wave JSA models identified a larger number of children living in the household as associated with higher risk. This places vulnerable claimants and claimants moving from HB to UC at disproportionate risk of negative housing outcomes, increasing their potential future need for financial or housing-related support. The higher risk of rent payment problems in people in employment in the HB model does not have an obvious explanation and requires replication and further detailed study, though it may be related to factors such as irregular incomes and working hours. The employment effect findings may also be affected by the use of an all-benefit claimant sample, as this entails a comparison between unemployed claimants and employed claimants with an additional non-employment reason to claim benefits – these unknown additional reasons may be influencing the increased effect.

Existing literature on the association between Universal Credit and financial hardship emphasises the increased risk to disabled claimants (Stacey, 2020, p23; Reeves & Loopstra, 2017, p7; Cheetham, Moffatt & Addison, 2018, p34). The logistic regression results for the HB comparison group reflects this concern, with significant worsening effects on housing payment difficulties frequently associated with having a disability or health condition. Visualising the housing insecurity trajectories for disabled and non-disabled claimants in different benefit groups indicated that while housing insecurity was consistently lower for disabled HB claimants, it increased post-welfare reform for UC and JSA claimants. This increase cannot be exclusively linked to the introduction of UC, as the welfare reforms included other changes, such as the benefit cap, that may have disproportionately affected disabled people. Moreover, work capability reassessments for disability-related benefit claims during the study period could trigger a changed claim (if the claimant is found fit for work) and consequent move to the UC system, contributing to a selection effect. However, these findings do demonstrate a potential increased risk of housing insecurity for disabled claimants moving onto the UC system, particularly for those moving from a more stable legacy benefit such as HB.

A significant relationship was also identified between receiving a lower benefit income and increased likelihood of housing insecurity. As well as highlighting people on low benefit incomes as a vulnerable group, the inclusion of benefit income in the model also sheds light on the potential driver of the association between UC and housing insecurity in these results. The treatment effect of claiming UC remains significant when controlling for benefit income, indicating that the association between UC and housing insecurity is not exclusively driven by changes in the amount of benefit income received by claimants. This finding is strengthened by a sensitivity analysis in which benefit income was not included in the model (Appendix 6). The treatment effect of UC is approximately the same in this model (both in magnitude and significance), demonstrating that income level is a significant predictor of housing arrears but not the key driver behind UC's effects on housing insecurity. There is a strong body of evidence, particularly stemming from qualitative research, that demonstrates the negative impact of UC mechanisms such as claimant waiting periods, direct payment of housing elements to claimants, and increased sanctioning (Cheetham, Moffatt & Addison, 2018; Dwyer, 2018; Hartfree, 2014; Reeves & Loopstra, 2020; Stacey, 2020). The results of this study corroborate these findings, indicating that particular characteristics of UC beyond monetary benefit value impact its relationship with housing insecurity.

This paper also provides insights into how we can effectively analyse UC and its complex rollout. The study has aimed to reflect how UC has been implemented in practice by employing a fixed effects approach and wave-by-wave analysis of new UC and legacy benefit claimants. This is intended to reduce the impact of individual selection effects that vary by place and time in the rollout, producing a more accurate comparison of similar claimants in similar circumstances. When taking into account UC's varied rollout in this way, the treatment effects of UC are frequently less significant than when taking a more general approach. Studies that do not sufficiently integrate the way in which UC's rollout has changed over time may therefore generate exaggerated accounts of UC's effects. As a result, they miss the more specific effects UC has at certain times or for certain population groups, making it harder to focus support or reform where it will be most effective. These findings therefore show the importance of incorporating the varied practical implementation of UC into comparison group construction and research design.

2.5.1 Limitations and recommendations

Despite providing a representative perspective on the population in England, the use of Understanding Society data for this analysis has several limitations. The conceptualisation of housing insecurity is restricted by the use of longitudinal survey data, as more extreme but less prevalent housing outcomes such as street homelessness are unlikely to be

represented in the sample, and are therefore excluded from analysis. The use of a self-reported housing outcome measure introduces more complexity, as respondents may have different perceptions on what constitutes difficulties paying for housing, or may not accurately report their experiences due to stigma. The study also concentrates on HB and JSA claimants as a comparison group, which could be extended in future research to include a wider range of legacy benefits. As the study has been stratified across two legacy benefits with differing demographic distributions rather than reflecting only one legacy benefit group, we would expect to find similar results for other comparison groups. However, the findings of this study may not fully capture the experiences of particularly vulnerable respondents who might be claiming benefits such as Income Support (for claimants with low or no income) or Employment and Support Allowance (for claimants who cannot work due to disability), for whom the transition onto Universal Credit might introduce particular financial pressures.

Finally, the study focuses on the time period surrounding the UC rollout. Future work could extend the current comparison of UC and JSA/HB using British Household Panel Survey data to offer insights into other changes such as the 2008 Global Financial Crisis and the 2012 Welfare Reforms (see Chapter 4). Data availability also means that the current analyses do not cover the COVID-19 pandemic, which would be a valuable topic for future research (see Chapter 4). The Understanding Society COVID-19 studies (Understanding Society, *COVID-19*) provide a strong foundation for this analysis, as they include data on evictions, difficulties meeting housing payments, and detailed questions on UC claims.

The study also does not include potential influencing characteristics preceding the analysed timeframe. Pathway analysis has demonstrated the effect of childhood conditions (Fitzpatrick, Bramley & Johnsen, 2013, p155; Chamberlain & Johnson, 2013, p66) and adverse events in adulthood (Fitzpatrick, Bramley & Johnsen, 2013, p153; Chamberlain & Johnson, 2013, p64-66) on housing outcomes. Earlier life variables are outside the scope of Understanding Society and the focus of the present research questions. However, they may have some influence on the benefit-housing outcomes relationship and may be relevant to future research on the topic.

The findings of this study demonstrate the unequal distribution of housing insecurity across different populations, and the potential for UC to negatively impact particular population groups more than others. In particular, the results highlight claimants with disabilities and claimants migrating from HB as at higher risk of experiencing increased financial and housing insecurity. Further research is recommended into how UC is likely to impact these groups, both for those currently in the UC system and those who will be affected as “Managed Migration” is enacted. The DWP has previously failed to sufficiently apply its own

data in evaluating UC (NAO, 2016, p9) or engage with external research on its outcomes (p40), making the execution and application of this research all the more crucial. Policy change is also recommended to ensure members of more vulnerable groups are not disproportionately affected by the UC system, supporting similar recommendations put forward by previous UC studies (Cheetham, Moffatt & Addison, 2018, p38; Stacey, 2020, p8). Potential protective measures include reinstating removed or reduced disability-related premiums, making the payment of housing costs more flexible and aligned with claimants' budgeting behaviours, removing the required 5 week wait for payment, and ring-fencing the housing element of UC so that sanctioning cannot be applied to essential housing costs. It is noteworthy that in Scotland the Universal Credit Scottish Choices give claimants the options of having their Universal Credit paid twice per month or directly to landlords (Scottish Government). An evaluation by the Scottish Government into Scottish Choices (Scottish Government, 2021) found that as of August 2020 38% of eligible claimants had opted into one or more of the Scottish choices (p9), with a higher likelihood of opting in among claimants with limited capabilities for work (p11). Reasons given for taking Scottish Choices included helping with money management and particularly avoiding rent arrears (p12).

2.6 Conclusion

The reshaping of the UK welfare system into the new Universal Credit system is a monumental change, affecting the lives of several million benefit claimants across different places, populations, and circumstances. The key aim of this study was to identify how this major change is affecting claimants' ability to meet housing costs in England. While the overall version of the analysis suggests a strong difference-in-differences effect of claiming Universal Credit on housing insecurity, the more nuanced perspectives provided by the different legacy benefit comparison groups and wave-by-wave samples demonstrate that this effect is not the same for all claimants. Instead, specific population groups are at a higher risk of experiencing increased housing insecurity when moving onto the Universal Credit system. In particular, Universal Credit claimants with disabilities and claimants migrating from Housing Benefit to Universal Credit are especially vulnerable to financial and housing hardship. This study also highlights the importance of reflecting the complex and varied implementation of Universal Credit in research design when analysing its effects. By doing so, we are able to better develop an understanding of Universal Credit that does not exaggerate its overall effects, but instead reveals the ways in which it impacts claimants unequally.

In its current form, the Universal Credit system negatively impacts particular population groups more than others, placing these claimants at disproportionate risk of experiencing financial hardship and housing insecurity. As the Universal Credit system's reach widens and its outcomes become increasingly entrenched in the lives of claimants, these vulnerable claimants in the Universal Credit system or waiting to be transferred as part of "Managed Migration" will potentially encounter increased and compounding housing difficulties. In order to effectively target policy and practice change, it is therefore crucial that future research into the effects of Universal Credit recognise and investigate its unequal impacts, building a stronger understanding of the populations and places most at risk of detrimental effects. As Universal Credit's ideological foundations have been associated with a wider shift in welfare policy and thought within broader European and international contexts (Gringrich & King, 2019; Koch & Reeves, 2021), these results are likely to be relevant to similar systematic change taking place in other countries.

Chapter 3 Exploring spatial variation in Universal Credit's effects on housing insecurity

Abstract: This study investigates the area-level variation in Universal Credit's effects on housing security, exploring at what geographical scales variation occurs. I applied a five-level multilevel logistic regression model to Understanding Society data. Findings showed that there is significant variation in the association between Universal Credit and housing insecurity across low-level geographies of MSOAs and LSOAs. This effect inequality reaches beyond area levels, with different individual characteristics and areas intersecting with particular population groups to form especially vulnerable sub-populations, such as Income Support claimants living in the North East of England and Housing Benefit claimants living in London. The varied vulnerability to Universal Credit-related housing insecurity demonstrates a misalignment between the centralised one-size-fits-all Universal Credit system and heterogeneity of the populations and places it serves, resulting in unequal and harmful effects for many claimants.

3.1 Introduction

Since the first implementation of the Universal Credit system in the UK in 2013, a wide body of research has identified relationships between claiming Universal Credit and increased financial hardship. This includes studies into the effects of Universal Credit on housing outcomes, such as increases in rent arrears (DWP, 2018, p16) and landlord repossessions (Hardie, 2020). In Chapter 2, I found that Universal Credit does indeed have a significant effect on housing insecurity in comparison to claiming Housing Benefit or Jobseeker's Allowance. Crucially this effect varied across different population groups, with a larger effect for people with disabilities and claimants moving from Housing Benefit to Universal Credit. These findings demonstrated that the Universal Credit system negatively impacts particular population groups more than others, placing these claimants at disproportionate risk of experiencing housing insecurity. The models employed in Chapter 2 also identified variation in housing insecurity associated with different regions and with different levels of Local Authority unemployment, housing deprivation, and housing affordability. Chapter 3 builds on this finding by exploring the area-level variation in Universal Credit's effects on housing security and investigating at which geographical levels significant variation occurs.

While much current Universal Credit research focuses on how it impacts different demographic populations, its area-level variation is relatively underexplored. As with much UK policy, Universal Credit is a centralised system implemented in the same way across England and Wales, with more flexibility in payment frequency in Northern Ireland (Northern Ireland Government, 2020) and further administrative differences in Scotland through the Scottish Choices programme (Scottish Government, 2021). A standardised social policy approach like this may be effective in a spatially socially and economically homogeneous society, but its effects could be unequal and potentially harmful in a spatially heterogeneous or unequal society. The UK has some of the highest levels of regional inequality among similarly wealthy countries, exhibiting higher spatial inequality than 28 other advanced OECD countries across a range of 28 indicators of inequality (McCann, 2020). The UK's high level of regional inequality has been linked by several studies to a disconnect between the highly centralised governmental system and the wide variation in social and economic conditions in the places it governs (McCann, 2020; Gray & Barford, 2018). UK spatial inequalities have been identified at a range of area levels, including between regions (Joseph Rowntree Foundation, 2020), individual towns and neighbourhoods (Beatty, Cole, Foden & Powell, 2014), and different area types such as rural or urban (Hastings, Bailey, Bramley & Gannon, 2017) or post-industrial areas (Rice & Venables, 2021).

There is a long history of area-based initiatives employed in the UK in response to this spatial inequality (Muscat, 2010). In 2021 the UK Government re-emphasised the policy goal of decreasing spatial inequality through the Levelling Up programme, which focuses on unequal economic performance and therefore economic solutions (DLUHC, 2021). However, Universal Credit remains spatially homogeneous, and there are no currently announced plans to change this as part of the Levelling Up agenda. By exploring whether there is spatial variation in Universal Credit's impact, this study considers whether it is likely to have differing and potentially harmful effects in particular areas. In particular, the presence of spatial variation in welfare reform impacts associated with policy changes (e.g. the unequal spatial impacts of the 2010 changes in Local Housing Allowance (Beatty, Cole, Foden & Powell, 2014) and the varying regional impacts of the National Minimum Wage (Dolton, Rosazza-Bondibene & Wadsworth, 2010), explored further in Section 3.2.3) demonstrates the need to incorporate spatial differences into the evaluation and implementation of Universal Credit.

This paper builds on the preceding investigation into the varying impact of Universal Credit on housing insecurity by further exploring the area-level variation in Universal Credit's relationship with housing insecurity among private and social renters in England. The current study explores at what geographical scale variation in housing insecurity, and the effect of Universal Credit on it, occurs, providing insights into whether experiences of Universal Credit differ between larger spatial areas, such as between regions, or at a more local level, such as between Lower Layer Super Output Areas. Area-level variation at both local and larger levels may indicate that Universal Credit's effects are linked to spatially unequal area-level policy implementation and effects, as well as area characteristics such as neighbourhood housing markets, employment markets, and the availability of housing and monetary support from local charities and local government. The research will also examine which area-level characteristics are associated with increased post-Universal Credit rollout housing insecurity, and how significant these are in explaining variation when compared to individual-level characteristics. To achieve this, a multilevel modelling research design will be employed using spatial scales of Job Centre Districts, local authorities, MSOAs and LSOAs. Using this approach, the study addresses a current research gap in the place-based impact of Universal Credit and how it relates to the more established population-based impact.

The research questions addressed by this study are:

- At what geographical level does variation in the relationship between Universal Credit housing insecurity among private and social renters in England occur?

- What area-level characteristics are associated with larger changes in housing insecurity among private and social renters in England following the introduction of Universal Credit?

The study finds significant variation in the association between Universal Credit and housing insecurity across low-level geographies of MSOAs and LSOAs. As the methods are stratified across multiple previous legacy benefit populations affected by the transition to Universal Credit, the study also demonstrates that this variation applies to all claimant populations, and is therefore a widespread feature of the shift to the Universal Credit system. This inequality reaches beyond area levels, with different individual characteristics and areas intersecting with particular population groups to form especially vulnerable sub-populations. Furthermore, particularly high variation in the effect of Universal Credit on housing insecurity among families who would previously have claimed Child Tax Credit was identified at an MSOA-level. The varied vulnerability to Universal Credit-related housing insecurity demonstrates a misalignment between the centralised one-size-fits-all Universal Credit system and heterogeneity of the populations and places it serves, resulting in unequal and harmful effects for many claimants. In response, this study recommends targeted economic support for especially vulnerable populations, increased flexibility and recognition of different populations and places into how Universal Credit is structured and implemented, and further research into the mechanisms causing geographical variance in Universal Credit's effects on housing insecurity, particularly at low-level geographies.

3.2 Literature Review

3.2.1 Spatial inequality in the UK

Interregional economic inequality in the UK is well established. McCann's research into inequality in 30 OECD industrialized countries identified the UK as having some of the highest levels of interregional inequality across several indicators relating to GDP, GVA and RDI (McCann, 2020, p256). The Joseph Rowntree Foundation's 2019/2020 report into poverty in the UK found that the highest poverty rates and increases in poverty were situated in London, the North of England, the Midlands, and Wales, with lower levels of poverty in the South of England, Scotland and Northern Ireland (p21). Several researchers have associated this interregional inequality with the UK's highly centralised government system, causing "space-blind" national governmental decisions (McCann, 2020, p257) that significantly impact local government and area conditions (Gray & Barford, 2018, p545). Centralisation has been specifically linked with unequal distribution of affordable housing, as demonstrated by Blaseio and Jones' (2019, p731) comparison of the higher levels of regional house price inequality in the UK to the more equal distribution in Germany's less centralised polycentric system. Housing affordability is a crucial element in spatial inequality, driving residential immobility and concentrating more vulnerable or deprived populations in less advantaged areas (Baker, Bentley, Lester & Beer, 2016, p73).

Alongside regional inequality, the UK's spatial inequalities extend into other geographic levels such as variance between rural and urban spaces (Hastings, Bailey, Bramley & Gannon, 2017, p2009), and lower-level variance between and within cities, towns, and neighbourhoods (Beatty, Cole, Foden & Powell, 2014, p2). Inequalities driven by the differing impact of policy take form through mechanisms such as higher cuts in universal public spending (Hastings, Bailey, Bramley & Gannon, 2017, p2018) and higher financial losses in benefit incomes for local households (Beatty & Fothergill, 2013) in highly impacted areas. These mechanisms take place at varying spatial scales, as demonstrated by the varied changes in benefit incomes following the welfare reforms. Research into this impact identified significant differences in benefit income change following the reforms at medium-level geographies such as towns and cities (Beatty & Fothergill, 2013) (e.g.specific towns like Blackpool experienced particularly high income loss), and at smaller level geographies such as within cities (e.g. different areas of Sheffield experienced different levels of benefit income change) (Beatty, Cole, Foden & Powell, 2014). Identifying these spatial inequalities at different spatial scales and their relationship to centralised policy

enables us to better investigate spatially variable social and economic effects and their potential to cause harm in particular places.

Spatial inequality in the UK is strongly influenced by historical patterns, including those rooted in the 1970s collapse of the British manufacturing and industrial sectors. This shift caused huge unemployment increases and economic shocks in previously heavily industrial regions, shaping a persistent spatial distribution of deprivation that persists today (Rice & Venables, 2021, p133). This is reflected in the distribution of income, unemployment, long term health conditions or disabilities, and the receipt of associated benefits, which are most prominent in previously industrial or mining areas (Hamnett, 2011, p149; Rice & Venables, 2021, p146). Higher levels of deprivation are frequently co-located with heavier reliance on benefits and weakened local capacity to respond to economic shocks, making these areas particularly vulnerable to changes to the benefit system. Deindustrialised areas have higher levels of reliance on central government grants (e.g. Liverpool, Manchester, Nottingham, Hull and Birmingham) (Gray & Barford, 2018, p550), and stronger detrimental impacts of welfare reforms in older industrial regions (e.g. North West and North East England, the South Wales Valleys, and Glasgow (Beatty & Fothergill, 2013, p12). The unequal spatial repercussions of industrial decline are therefore significant to how financial instability and hardship is distributed across the UK, and is likely to continue to interact with present day changes in British welfare and economic systems.

3.2.2 Changing spatial inequality

Despite the persistence of historical patterns of deprivation, the spatial economic distribution of the UK is undergoing continual change, particularly as a result of the introduction of austerity and welfare reform following the 2007 Global Financial Crisis. Baker, Bentley, Lester & Beer's study into the causes of Australian locational inequality associates the non-static "geography of disadvantage" with residential mobility driving changes in the social and economic profiles of areas, particularly when propelled by increasing disadvantage (2016, p66-7). This process can also be seen in the UK's changing spatial profile, and is exemplified by recent patterns of the decentralisation of poverty from urban centres. Zhang and Pryce's research on the changing distribution of poverty in England and Wales found evidence of the decentralisation of lower-income households and benefit claimants from large urban centres towards suburban areas, negatively impacting access to employment and services, alongside increased centralisation of poverty in small cities and towns (2020, p2026-7). These processes of reshaping contribute to changes in how social and economic

disadvantage and the ability to respond to economic shocks are distributed across specific areas and the UK overall.

The current body of evidence particularly associates shifts in UK spatial inequality with changes to housing policy and affordability, such as the deregulation of the private rental sector (Zhang & Pryce, 2020, p2019), the depletion of social housing provision (Zhang & Pryce, 2020, p2019; McKee, Muir & Moore, 2017, p9), and the focus on subsidising home-ownership over rental (McKee, Muir & Moore, 2017, p9). The push factor of increasing policy-driven housing unaffordability is situated within a wider transformation of the relationship between national and local government in the UK, through which the implementation of national austerity measures has been pushed to a local level, reducing local governments' abilities to respond to area-specific inequalities (Gray & Barford, 2018, p543). This is prominent in elements of welfare reform such as the 2013 Benefit Cap, an upper limit on the total amount a household can claim in benefits which reduced the effectiveness of social security in more expensive areas, and Universal Credit, which implements social security using a centralised one-size-fits-all approach. In combination, changes in national housing policy and local level implementation of austerity policy impact different areas unequally, exacerbating existing spatial inequalities and driving the creation or displacement of new inequalities.

Shifts in the distribution of economic disadvantage are also influenced by individual area characteristics, causing further spatial inequality. In Donald, Glasmeier, Gray & Lobao's (2014) study on the effects of austerity on North American and European cities, the authors assert that cities interact differently with policy changes in comparison to other area types due to their concentration of both economic power and disadvantaged populations (p4). The close proximity of inequalities in cities might therefore intensify the unequal impact of austerity policies, causing disproportionate impacts on disadvantaged urban populations (p12). Similarly, Hastings, Bailey, Bramley & Gannon (2017) identify the heightened effects of austerity on disadvantaged residents of English cities, with urban metropolitan councils such as Coventry and Newcastle experiencing greater funding loss, fiscal stress, and service reduction than rural councils (p2010, p2014, p2018). Zhang & Pryce's findings support the assertion that spatial changes occur differently in large urban centres, with pronounced decentralisation of poverty taking place in large TTWAs (Travel to Work Areas), but little change taking place in small or medium TTWAs (2020, p2026). These variations highlight the importance of integrating spatial elements and reflecting the local characteristics of areas when researching the impact of national policy change.

Within a UK context, London has an especially unique profile of economic inequalities, which must be taken into consideration for policy impact research. The Centre for Local Economic Strategies' (CLES) study of austerity impacts in London highlights several area-specific patterns of inequality and spatial change. London experiences especially extreme inequalities due to the adjacency of affluence and disadvantaged areas (CLES, 2014, p6). This inequality is linked with patterns of spatial change including the suburbanisation of poverty (CLES, 2014, p4) and council provision of financial support for families to move within or outside of London due to affordability (p10), driving unique churning and migratory residential patterns. As in other UK cities, these changes can be associated with area-level population and housing characteristics. The proportion of London's population claiming housing-related benefits is especially high, with around a quarter of London households receiving Housing Benefit in 2014 (CLES, 2014, p9) compared to a national average of 20% (DWP, 2022a). In combination with high rental costs, the heavy dependence on housing-related benefits increases London's disproportionate vulnerability to welfare and housing policy changes (Hamnett, 2014, p500; Beatty & Fothergill, 2013, p16). This vulnerability was particularly intensified by the Benefit Cap. On its introduction in 2013, just under half of the households directly impacted by the Benefit Cap lived in London (CLES, 2014, P10), limiting the extent to which benefits for London residents can reflect higher local housing costs.

3.2.3 Unequal impact of welfare changes

The impact of the UK welfare system is also subject to considerable spatial inequality. Beatty and Fothergill's investigation of the 2012 welfare reforms found different effects for different places (2013, p13). In particular, the study identified a strong positive relationship between the financial impact of the welfare reforms and the existing level of deprivation, with more deprived areas experiencing greater financial hits (2013, p18). This disparity is associated with the varied distribution of benefit claimants, which is in turn linked to area-level characteristics such as local labour and housing markets (Beatty, Cole, Foden & Powell, 2014, p13). The spatial distribution of people experiencing poor health or claiming disability-related benefits is also closely linked with the distribution of unemployment and higher levels of deprivation, with particularly high concentrations in Wales and the North East of England (Roberts & Taylor, 2019, p2). This unequal distribution of people reliant on benefits or unable to seek work due to disability may make certain areas more vulnerable to welfare spending cutbacks or policy change.

The unequal effects of previous welfare policy changes have been studied through a spatial

lens. Beatty, Cole, Foden & Powell's analysis of the 2010 changes to Local Housing Allowance (including capping rates and reducing the basis of LHA rates from the median of local market rents to the 30th percentile) found different regional patterns of impact, with more significant decrease in financial housing support in post-industrial areas and London (2014, p33). Dolton, Rosazza-Bondibene and Wadsworth's (2010) analysis of the varying regional impact of the National Minimum Wage (NMW) identified a stronger effect on post-industrial and rural periphery areas due to higher concentrations of low-income residents (p8), associating the NMW with decreased wage inequality in these areas (p21). Policy changes aimed at housing quality improvement have also had varying impact due to area-level differences in housing stock and markets, such as energy efficiency improvement policies having fewer benefits for rural households with predominantly older housing stock, and equity-release or remortgaging focused policies having little impact in lower-value housing markets (Preece, Robinson, Gibb & Young, 2021, p62). The findings of spatial variation in welfare reform impacts associated with earlier policy changes demonstrates the need to incorporate spatial differences when analysing new policies and their effects.

Despite this, relatively little research has been undertaken into the potential spatial variation in the impacts of the recent major overhaul in UK welfare provision implemented through Universal Credit. Universal Credit (UC) is an integrated benefit for all working age claimants, first implemented in 2013 and gradually rolled out to more people and places over the following years. The rollout is still in progress, with the final stage of Managed Migration, which will migrate all remaining legacy benefit claimants to the UC system, planned for the future. It replaces a variety of legacy benefits to create one centralised system[1], requiring system migration on a massive scale and affecting huge numbers of claimants, with 5.6 million UC claimants in January 2022 (DWP 2022b) and 2.6 million remaining legacy benefit claimants who will enter the UC system through Managed Migration (DWP 2022c). UC differs from the legacy benefit system in several key ideological and mechanical ways. Researchers have associated UC with an ideological shift in welfare provision, refocusing from social security to employment activation (Koch & Reeves, 2021, p7) by incorporating more elements of instability (Koch & Reeves, 2021, p3) and conditionality (Reeves & Loopstra, 2020, p3). This shift is implemented through mechanical changes including increased sanctioning rates (Adler, 2018), a waiting period of at least 5 weeks for a first payment intended to replicate monthly payment patterns in employment, and the monthly payment of housing support directly to claimants rather than landlords.

[1] Housing Benefit, income-related Employment and Support Allowance (ESA), income-based Jobseeker's Allowance (JSA), Child Tax Credit, Working Tax Credit, and Income Support

These changes have been linked with increased risk of financial hardship for UC claimants, with many claimants experiencing new debt or rent arrears during the waiting period (Reeves & Loopstra, 2020, p3; Stacey, 2020, p30) or due to a misalignment between the UC payment system and low-income households' existing budgeting behaviours (Hartfree, 2014, p17; Hickman, 2021, p237). A strong body of evidence therefore associates UC with a detrimental economic impact for many claimants, such as increases in housing payment arrears (DWP, 2018, p16) and food bank use (Reeves & Loopstra, 2020, p17). Existing research demonstrates significant variations in this economic impact for different populations, with disproportionately detrimental effects for lone parents (Cheetham, Moffatt & Addison, 2018, p37) and claimants with disabilities (Reeves & Loopstra, 2017, p7; Brewer, Joyce, Waters & Woods, 2019, p.15). Findings demonstrating the spatial variation of previous welfare reform's impacts, as outlined earlier in this section (Beatty & Fothergill, 2013; Beatty, Cole, Foden & Powell, 2014; Dolton, Rosazza-Bondibene & Wadsworth, 2010), indicate that the effects of Universal Credit are likely to vary across places as well as people.

3.2.4 Unequal access to support

The unequal spatial distribution of economic deprivation and welfare impact across the UK is also influenced by disproportionate access to investment and improvement on area and individual levels. CLES criticises the current UK approach to local government funding as failing to recognise different social and economic needs in different areas, contributing to unequal outcomes for advantaged and disadvantaged areas (CLES, 2014, p21). Coyle and Sensier (2020) links this unequal approach to the infrastructure investment appraisal process set out in the UK HM Treasury's *The Green Book*, which prioritises funding for areas with high current productivity (p291). This strategy concentrates public investment in already economically advantaged areas of the UK, particularly prosperous areas of London (Coyle & Sensier, 2020, p283), further compounding spatial inequalities. Gray and Barford's (2018) analysis of the varying impact of austerity across the UK identifies local spending cuts as a crucial element of unequal access to investment. The study found significant variation in austerity policy spending cuts in different areas (p550), with larger cuts frequently correlated with more deprived areas (p553). The authors also highlighted spatial inequality in local governments' capacity to cope with spending cuts and draw on other financial resources such as council property assets, council tax, and increasingly devolved business tax (p553). In particular, local authorities have an unequal dependency on central government grants, with areas in Northern England and London relying more heavily on grants (p553). As grants are affected by welfare reform, these areas are consequently more vulnerable to spending

cuts and the effects of austerity (p546). In combination, the mechanisms of distribution of investment and austerity in the UK fail to address area-level differences in economic need and capacity to reduce spending on public services and infrastructure, often perpetuating and deepening spatial inequalities.

As well as differences in area-level resource provision, there is evidence of spatial inequality in individual-level access to opportunities, services, and support. Changing patterns of where disadvantaged households live, driven largely by changes in housing policy and affordability, mean corresponding shifts in proximity to employment opportunities and services (Zhang & Pryce, 2020, p2017), with worsening access for low-income households (p2025) and benefit claimants (p2027) in particular. These population groups were found to be especially vulnerable to the access effects of spatial changes due to several individual and area-level characteristics, including budget restrictions, low rates of car ownership, poor local public transport, and higher perceived risk of neighbourhood crime (p2020). Hastings, Bailey, Bramley & Gannon (2017) also note that low-income areas are more affected by cuts in universal services such as parks and libraries (p2018), reducing access to the benefits provided by these services. Alongside differing access to opportunities and services that might improve individual social and economic conditions, areas have varying capacities to support individuals experiencing financial hardship. Reeves and Loopstra (2020) highlight the unequal provision of food banks in different areas, resulting not only in reduced access to support, but also in hidden levels of hardship, further preventing the identification and addressing of economic need (p17). The unequal spatial distribution of funding, resources, and services across the UK therefore significantly affects individuals' ability to avoid and escape financial hardship according to which area they live in.

The UK Government has recognised the need for a policy-based intervention in addressing spatial inequality and its impacts through the Levelling Up programme, introduced in the 2019 Conservative Party manifesto. Levelling Up is a broad programme that aims to increase economic growth and productivity (DLUHC, 2021, pxii) in areas experiencing economic underperformance and consequent lower living standards (Liddle, Shutt & Addidle, 2022, p4). The programme recognises the effect of unequal experiences of housing quality and security as a key part of delivering spatially equal social and economic outcomes (DLUHC, 2021, p434). However, the programme has been criticised for a strong focus on strictly economic solutions (Connolly, Pyper & van der Zwet, 2021, p529), such as its emphasis on increasing access to homeownership in response to unequal housing experiences (DLUHC, 2021, p434), as well as for its lack of sufficient funding, policy clarity, and spatial coordination (Liddle, Shutt & Addidle, 2022, p6). The context of the Levelling Up

programme is significant when investigating the recent trajectories of housing insecurity across different areas of the UK, as it highlights a current policy goal of improving housing opportunities in particular areas and decreasing the impact of spatial inequality in housing and wider economic spheres. Despite its crucial role in the economic survival and progression of claimants, mentions of UC in the Levelling Up programme are infrequent and do not mention any potential spatial elements (DLUHC, 2021), potentially placing it at odds with policy aims focused on increasing spatial equality.

3.2.5 Considerations for researching spatially

Existing studies into the spatial inequalities of deprivation, housing conditions, and welfare impact in the UK provide insights not only into social topics, but also into spatial methodological challenges. Dean, Dong, Piekut and Pryce's (2019) research into neighbourhood boundaries in the UK emphasises the need to incorporate real-life area characteristics and "asymmetries" into spatial research (p273). The challenges involved in this approach can be seen in Rice & Venables' (2021) analysis of the historical causes of UK regional inequality. While the research was carried out at an LAD (Local Authority District) level due to consistent data availability, the authors note that the purpose of this spatial unit, intended to facilitate local government, does not necessarily align effectively with the study's focus on local labour markets (Rice & Venables, 2021, p135). By contrast, Zhang and Pryce's poverty decentralisation research is able to draw on multiple geographical units with different purposes or functions, such as LSOA level geography, TTWA units to facilitate insights into work and travel (Zhang & Pryce, 2020, p2021), and Built Up Area (BUA) units to identify urban centres (p2025). By integrating these different area levels into the analysis, the study is able to capture a more comprehensive and true-to-life perspective.

The use of multiple geographical units also enables insights into how spatial patterns vary or persist across different levels. This is illustrated by Beatty, Cole, Foden and Powell's (2014) study into the effects of welfare reform in Sheffield. At Local Authority level, the study identified a financial loss in welfare spending in line with the national average (p8). However, at ward level the study identified a more complex and uneven effect, with above-average impacts in more disadvantaged areas of Sheffield (p9). Dolton, Rosazza-Bondibene and Wadsworth (2010) similarly applied their analysis of the National Minimum Wage using several different geographical units. In this instance, the findings remained consistent across all analysed units, demonstrating a persistent effect distinct from the area unit type (p21). Research by Buscha, Gorman and Sturgis (2021) on spatial social mobility in England and Wales was also carried out at regional and Local Authority District levels, resulting in findings

of spatial inequality in social mobility both between and within regions (p1390), enabling insights into how social mobility took shape differently at different geographical levels. The use of multiple geographical units or levels is therefore important, facilitating a more robust integration of real-life area characteristics, and enabling the identification of differences and similarities across different levels.

3.2.6 Summary of research context

This paper focuses on the introduction of the Universal Credit system, a hugely significant change to the UK's social security system. This change takes place against a backdrop of high levels of spatial inequality and well-evidenced geographical patterns of economic deprivation in the UK. Spatial inequality has been identified across a range of spatial scales, from large scale regional inequalities, through medium-level inequalities between towns and cities, to small-scale inequalities within areas at the level of MSOAs or LSOAs. The economically unequal geography of the UK is exacerbated by an increasingly centralised approach to government policy and social security, through which national policy is frequently implemented without flexibility for different areas and their needs. Areas interact differently with policy due to variations in local characteristics, existing levels of deprivation, access to funding and resources, dependence on the welfare system, and capability to absorb shocks and adapt to economic changes. This results in different impacts of policy, demonstrated by previous policy changes such as changes to the National Minimum Wage which decreased wage inequality more in lower-income areas (Dolton, Rosazza-Bondibene & Wadswort, 2010), and changes in Local Housing Allowance which caused more significant decrease in financial housing support in areas with higher levels of deprivation (Beatty, Cole, Foden & Powell, 2014). UC's associations with increased financial hardship and differing impacts on different populations (Chapter 2) indicate that it is similarly likely to have different impacts in different places, contributing to further spatial inequality. This paper therefore explores the area-level variation in Universal Credit's effects on housing security, investigating the geographical scales at which variation occurs and which area-level characteristics are associated with increased post-Universal Credit rollout housing insecurity.

3.3 Data and methods

The paper uses data from Understanding Society, a longitudinal household panel study that collects annual survey data on the experiences of UK residents on a wide range of social and political topics (University of Essex, 2020). The data currently covers annual observations from 2009 to 2020. As the data can be accessed at regional, Local Authority and LSOA level, Understanding Society also enables both individual and area-level analysis. This is especially important for research into housing outcomes and their causes due to the potential significance of the interaction between individual and local variables.

This study employs a dependent variable of problems meeting housing payments and an independent variable of claiming UC or legacy benefits in order to compare housing insecurity among UC and legacy benefit claimants before and after the introduction of UC. The analyses focus on respondents in England who are living in rented housing and are claiming UC or an equivalent legacy benefit. Due to variability in the administrative geographical levels used in different devolved nations, the scope of this study has been limited to England in order to ensure like-for-like comparison of areas. Included respondents were those living in social or private rental housing, between the ages of 18 and 65 (as UC is a working-age benefit), and who claimed UC or one of the legacy benefits it replaces (HB, JSA, WTC, CTC, ESA or IS) at some point during the data collection period. The data is analysed at a person-year unit level, with each individual measured up to 11 times in the sample. The analysis was performed using multiple sample groups of Understanding Society data. The UC group (claimants who entered the new UC system through a new claim or migration from legacy benefits) consists of all private or social renters of working age claiming UC. The comparison groups (claimants who remained on the legacy system) consist of all private or social renters of working age claiming one of the replaced legacy benefits.

Table 3.1 Sample composition *

	Benefit description	Sample size (observations)	Sample size (individual respondents)
Full sample		48075	10385
UC group	Universal Credit is a centralised benefit replacing six legacy benefits.	4820	759

HB comparison group	Housing Benefit helps low-income claimants pay for rent.	34562	6962
JSA comparison group	Jobseeker's Allowance is a benefit for claimants who are working fewer than 16 hours per week, and able to work and seeking employment.	13525	2686
WTC comparison group	Working Tax Credit provides financial support for claimants who are in work and on a low income.	22514	4224
CTC comparison group	Child Tax Credit provides financial support for claimants who are on a low income and have dependent children.	6419	1100
IS comparison group	Income Support provides financial support for claimants on low or no income who are not able to work.	17016	3386
ESA comparison group	Employment and Support Allowance provides financial support for claimants with disabilities that affect their capacity to work.	10255	1679

** There may be overlap between samples due to participants claiming multiple benefits.*

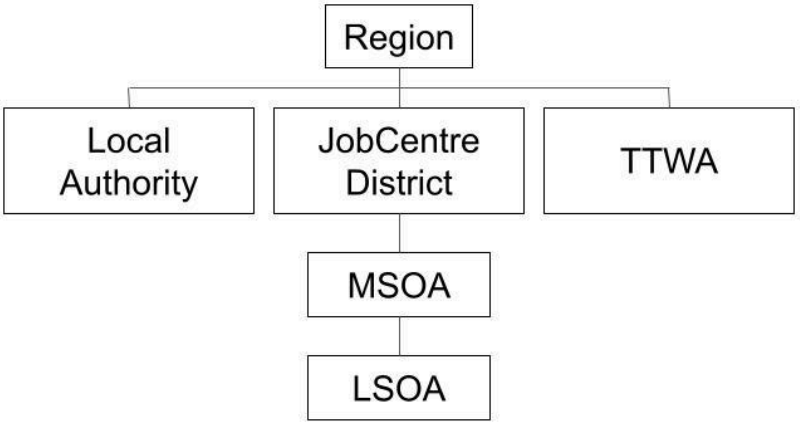
The geographic levels included in the Understanding Society data are regions, Local Authorities and Lower Layer Super Output Areas (LSOA). By linking geographic codes using additional data from the UK Government's Geoportal, I have added three additional levels: Middle Layer Super Output Areas (MSOA), Travel to Work Areas (TTWA), and the DWP's JobCentre Plus Districts. The additional levels enabled the identification of variation at a wider range of spatial scales, and included spatial scales associated with potential drivers of affordability such as access to employment (TTWAs) and support services (JobCentre Plus Districts). While less consistent or as commonly used in research as other geographies, JobCentre Plus Districts are the unit at which UC is administered and rolled out, and are therefore important in this analysis. Details of these spatial levels can be found in Table 3.2, and their nesting structure is illustrated in Figure 3.1.

Table 3.2 Geographical units

Unit	Description	Spatial nesting	Sample size per unit: range (USoc*)	Sample size per unit: mean (USoc*)	Population per unit (Average in UK)	No. of units (USoc*)
Region	9 regions of England	N/A	1700-5700 households	28164	2.7-9.2 million	10
JobCentre District	DWP administrative areas made up of several JobCentre offices	Nests in regions	500-2200 households	9053	Data not available	29
LA	Local government administrative area	Nests in regions	1-300 households	12070	Varied (2000 - 1.6 million people)	325
TTWA	Statistical area in which people often commute to an urban centre	Nests in regions	1-150 households	1646	Varied (6800 - 8.4 million)	153
MSOA	Census-based statistical area to enable local-level analysis	Nests in LA/JCD/ TTWA	1-120 households	42	4000 households	3444
LSOA	Census- based statistical area to enable smaller local-level analysis	Nests in MSOA	1-39 households	15	650 households	6052

** Understanding Society dataset*

Figure 3.1 Nesting structure of geographical units



These area levels were then used to develop several multilevel logistic regression models, in which the dependent variable is whether or not the respondent has experienced difficulties meeting housing payment in the past 12 months. A conditional logit model was employed, which is equivalent to a fixed-effects model and does not require clustered standard errors. As this method controls out between-subjects effects, the results produced by the models in this study are within-subjects effects.

Explanatory variables were selected based on existing research into factors influencing housing insecurity, with individual variables derived from Bramley and Fitzpatrick (2018). The independent variables included in the model are: UC effect, benefit income amount, tenure type, employment status, age bracket, health status, number of dependent children, whether the respondent is single or living with a partner in household, region, local authority unemployment rate, local authority and housing affordability ratio, and the Access to Housing and Services IMD decile (by local authority). Wave fixed effects were also included. The models were tested with ethnicity, migrant status and local authority rural/urban classification included, but these were found to be not significant and were therefore removed.

Levels were added to the models iteratively, using AIC comparisons to identify which levels improved model fit. Using the most suitable version of the logistic regression model, alternative versions were then run and compared to determine whether including random slopes at each level improved the model. By testing random slopes, allowing effects to vary across different spatial units, I aimed to identify whether significant variation in the effect of UC on housing insecurity could be found at any of the included levels.

3.4 Results

3.4.1 Level selection

3.4.1.1 Three level model

Levels were added to the models iteratively from larger to smaller levels, using AIC comparisons to identify which levels improved model fit. As two of the levels are non-spatial (individual respondent and data collection year), these were considered essential to the analysis and included by default.

A three-level version of the multilevel logistic regression model was run, including data collection year, individual respondent and JobCentre District as levels, and including the selected independent variables. This model produced similar patterns of significance to the models employed in Chapter 2 (which highlighted variables such as Universal Credit claim, benefit income, employment, and disability status as significantly associated with housing insecurity), with a similar difference between the HB and JSA results (i.e. generally larger effects in the HB model). However, the UC effect was smaller (but still significant) for the multilevel versions. Area-level characteristics and regions were not significant in either model, other than Housing and Services Decile in the HB model.

3.4.1.2 Four level model

A four-level version of the multilevel logistic regression model was run, including individual respondent, JobCentre District and MSOA as levels, producing similar results to the three-level model. AIC comparisons demonstrated that the four-level models had significantly better fit than the three-level models for both the HB and JSA groups.

3.4.1.3 Five level model

A five-level version of the multilevel logistic regression model was run, including individual respondent, JobCentre District, Local Authority, and MSOA as levels. AIC comparisons demonstrated that this version was not significantly better than the four-level model for either sample. A version of this model was run substituting Local Authority for TTWA, due to the potential relationship with affordability through access to employment. The TTWA model was also not significantly better than the four-level model.

Another five-level version of the multilevel logistic regression model was run, including individual respondent, JobCentre District, MSOA, and LSOA as levels (Figure 3.2). JobCentre District was included due to its use in the administration of Universal Credit, making its inclusion valuable in identifying a potential relationship between the spatial administration and housing insecurity effects of Universal Credit. LSOA was included alongside MSOA as, while both units measure a form of neighbourhood geography, they capture different scales (LSOA = 650 households, MSOA = 4000 households). Existing studies have asserted the value of including multiple levels of neighbourhood geography when there is a potential for clustering of the dependent variable at different spatial scales (Manley et al, 2015; Jones et al, 2015). In terms of housing outcomes, it is possible for relevant factors such as tenure and housing costs, and in turn housing disadvantage, to cluster at both a broad neighbourhood level, and a micro-neighbourhood level (e.g. a housing estate or collection of apartment blocks). Due to the potentially different significance of the spatial scales, both LSOA and MSOA were therefore included in the model.

AIC comparisons demonstrated that this five-level model was significantly better than the three-level models and four-level models for both the HB and JSA groups. The level variance at each stage of this iterative process can be found in Table 3.3.

Figure 3.2 Multilevel structure of final 5-level model

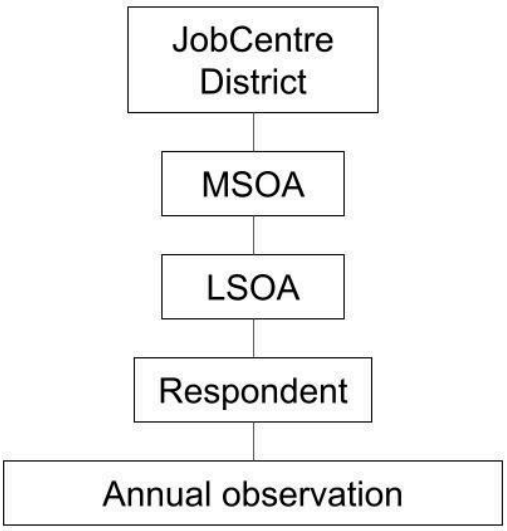


Table 3.3: Level variance across iterative multilevel model building process

	2-level model	3-level model	4-level model	5-level model
Individual	1.7	0.43	0.42	0.42
LSOA		1.99	1.92	1.93
MSOA			0.07	0.07
JC District				0.000008

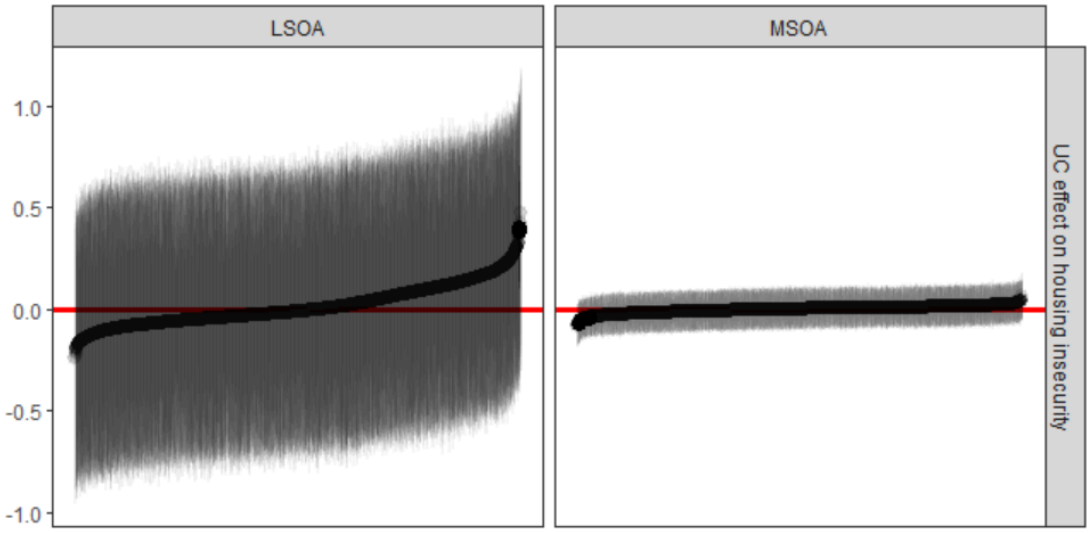
At this stage the model variables were refined. Through this process, the respondent's ethnicity and whether the respondent was born in the UK were removed from the model, as they were not significant for any of the sample groups, to ensure the already complex model is not overparameterised (i.e. including excessive parameters to detriment of model fit). The final version of the model was run including ethnicity and whether the respondent was born in the UK as a sensitivity analysis for each benefit group. Neither variable was significantly associated with housing insecurity in the sensitivity analysis models. The model results with the final included variables for the full sample (prior to the addition of random slopes) can be found in Appendix 11.

3.4.2 Testing random slopes

Using the five-level version of the multilevel logistic regression model with levels of individual respondent, JobCentre District, MSOA, and LSOA, alternative versions of the model were run to identify whether the addition of random slopes on the UC variable improved the model fit. These models were run for the overall sample group and all comparison group samples (HB, JSA, WTC, CTC, ESA and IS). Random slopes were added individually for region, JobCentre District, MSOA, and LSOA, allowing us to measure the effect for each individual level rather than collectively, and compared to the non-random slopes model using ANOVA testing.

The overall sample model was also run excluding the area-based explanatory variables of local authority unemployment rate, local authority housing affordability ratio, and the Access to Housing and Services IMD decile (Appendix 13). This model produced very similar results to the full model, indicating that these area-based variables are not strongly associated with the spatial variation effect of Universal Credit on housing insecurity.

Figure 3.3 Effect variation across LSOAs and MSOAs for full sample



When applied to the Housing Benefit comparison group, the inclusion of random slopes at the LSOA level significantly improved model fit. For all other comparison groups, the inclusion of random slopes at both MSOA and LSOA levels significantly improved model fit. This indicates significant variance in the effect of UC on housing insecurity at LSOA and MSOA levels (as demonstrated in Figure 3.3), but not at larger area types such as JobCentre District or region. The effect of Universal Credit on housing insecurity varies across LSOAs from -0.27 to 0.48, with a narrower effect range for MSOA of -0.07 to 0.04.

3.4.3 Significant variables

Table 3.4: Regression table for whole sample multilevel logistic regression model

Random effects				
Level		**Variance**	**Std. Dev.**	**Corr.**
Individual	Intercept	0.41	0.64	
LSOA	Intercept	1.9	1.38	
	Universal Credit	0.15	0.39	0.37
MSOA	Intercept	0.06	0.25	
	Universal Credit	0.15	0.12	-0.9
JC District	Intercept	0.00002	0.004	

Fixed effects				
Variable	**Effect**	**Std. Deviation**	**P value**	**Sig.**
Universal Credit	0.18	0.09	0.04	*
Data collection wave (Ref: Wave 1)				
Wave 2	-0.22	0.05	0.00001	***
Wave 3	-0.15	0.05	0.004	**
Wave 4	-0.15	0.05	0.005	**
Wave 5	-0.16	0.06	0.006	**
Wave 6	0.1	0.07	0.12	
Wave 7	-0.28	0.07	0.0001	***
Wave 8	-0.28	0.08	0.0003	***
Wave 9	-0.24	0.09	0.005	**
Wave 10	-0.13	0.09	0.15	
Private rental (Ref: Social rental)	-0.51	0.04	0.000001	***
Employed (Ref: Unemployed)	0.16	0.04	0.000003	***
Age bracket (Ref: 18-20)				
21 to 24	0.23	0.1	0.02	*
25 to 34	0.18	0.09	0.05	
35 to 44	0.04	0.09	0.67	
45 to 54	-0.05	0.09	0.59	
55 to 64	-0.3	0.1	0.003	**
Single in household	0.06	0.04	0.12	
Disability	0.18	0.03	0.000001	***
Benefit income (£)	-0.00006	0.00002	0.005	**
Number of dependent children	0.008	0.006	0.2	
Area-level variables				
Housing and services decile (LSOA)	-0.002	0.06	0.97	
Unemployment rate (LA)	0.05	0.11	0.61	
Median housing affordability ratio (LA)	0.03	0.15	0.84	

Regions (Ref: East Midlands)				
East of England	-0.04	0.13	0.78	
London	0.42	0.15	0.004	**
North East	0.17	0.15	0.26	
North West	-0.07	0.12	0.54	
South East	-0.08	0.13	0.53	
South West	-0.27	0.14	0.05	
West Midlands	-0.11	0.12	0.38	
Yorkshire and the Humber	-0.17	0.12	0.16	

Across the overall sample, claiming UC is on average significantly associated with an increased likelihood of experiencing housing payment problems (Table 3.4). However, this effect is not consistent for all legacy benefit sample groups. For most sample groups (HB, JSA, IS, ESA and WTC) there is no significant UC effect (Appendix 12), indicating that there is no effect in the average area unit, but instead a variability in that effect across areas, with associated increases or decreases in housing insecurity in particular places. Child Tax Credit differs notably from this pattern, with the average effect of UC remaining significant when the multilevel structure and area-level random slopes are applied. This is further investigated in Section 3.4.5.

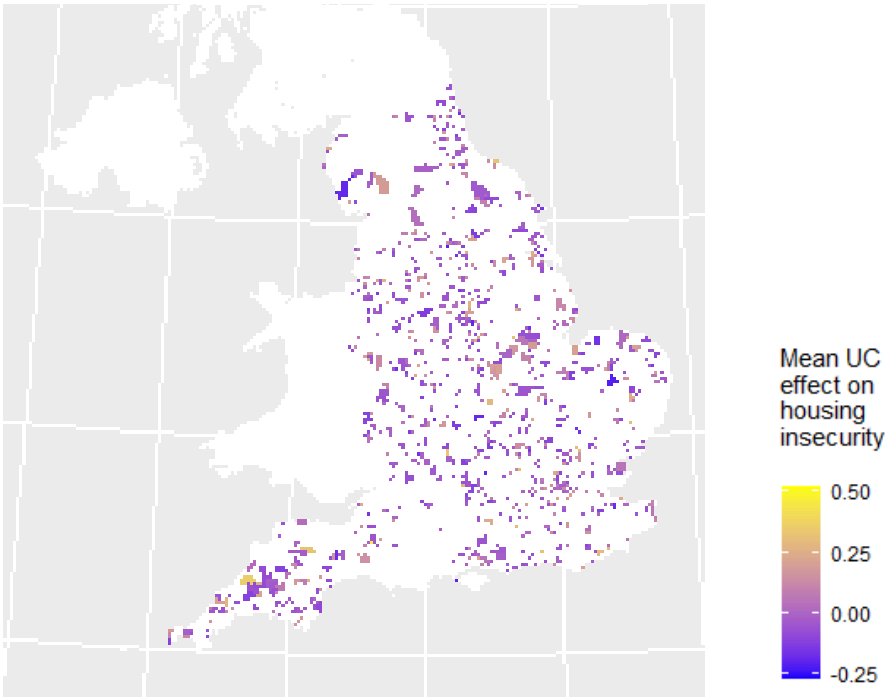
The results highlight several individual-level characteristics that are associated with a higher likelihood of experiencing housing insecurity among the sample groups. Living in social housing (rather than private rental) and having a disability were associated with higher housing insecurity across all groups except for the ESA group. Being in employment was significantly associated with higher housing insecurity for the WTC, HB, and IS comparison groups. Receiving a lower benefit reward was significantly associated with higher housing insecurity for the HB, JSA, ESA, and IS comparison groups. A higher number of dependent children was significantly associated with higher housing insecurity for the HB comparison group. Claimants with particular combinations of individual characteristics and previous assignment to these legacy benefit groups may therefore be particularly vulnerable to housing insecurity.

Area-level characteristics were less significant than individual-level characteristics, with few significant regional relationships. Among the WTC comparison group, living in the South

West of England was significantly associated with a decreased risk of housing insecurity. Among the IS comparison group, living in the North East of England was significantly associated with an increased risk of housing insecurity. Among the HB comparison group, living in London was significantly associated with an increased risk of housing insecurity.

3.4.4 Significant locations and spatial distribution

Figure 3.4 Map of the mean effect of the introduction of Universal Credit on housing insecurity in LSOAs in England



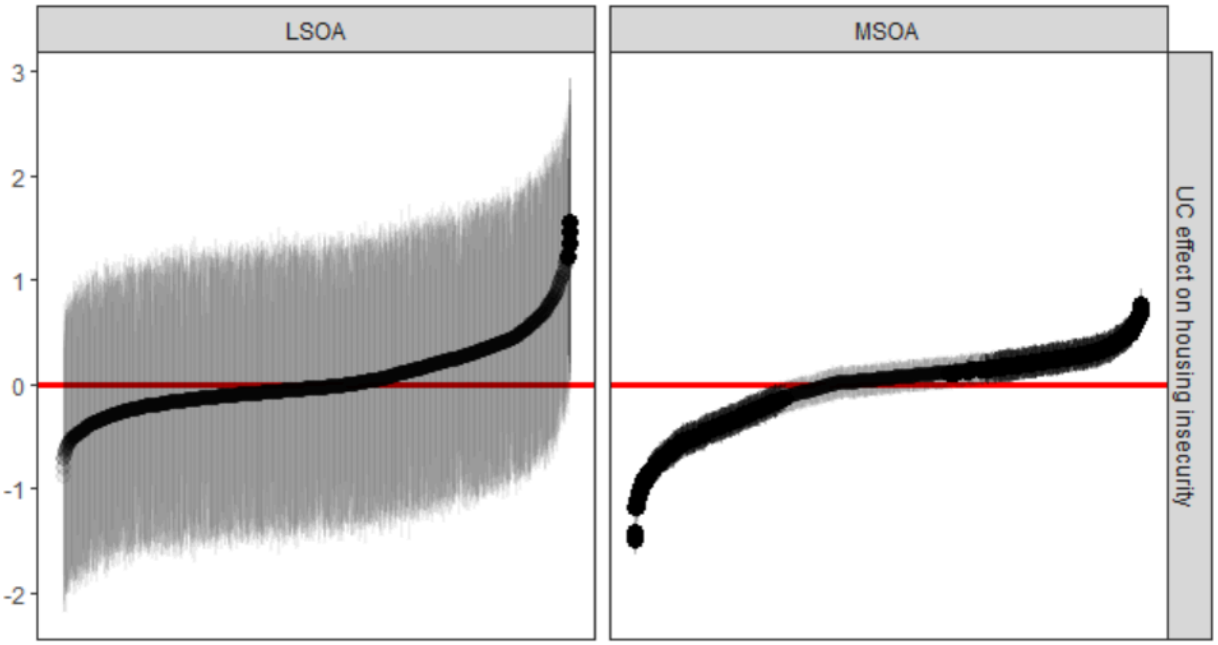
Visualising the effect of UC on housing insecurity in different LSOAs in map form (Figure 3.4) provides insights into how the variation in this effect is distributed spatially. The effects shown here are net of any MSOA differences and include fixed effects. Due to the use of Understanding Society data which samples the UK population, which has here been further sampled to only include benefit claimants living in rented accommodation, only a portion of LSOAs are represented. From this sample, we can see that LSOAs with positive or negative UC effects on housing insecurity can be found in all parts of England. Furthermore, areas with very different UC effects can be found in close proximity to one another, with several instances of LSOAs with negative effects neighbouring LSOA with positive effects. This indicates variation in the effect of UC's introduction on housing insecurity across different LSOAs, including LSOAs within the same larger area, e.g. in the same region.

When area-based explanatory variables are included, the only significant effect for an LSOA is in Wall End Newham 023E, in which there is a positive effect indicating a harmful effect of UC on housing insecurity. This LSOA is part of East Ham in Newham, an area of London with high unemployment and poverty rates (IES, 2010). Only three respondents reside in this LSOA, which somewhat limits the robustness and generalisability of this result, although this will to some extent have been accounted for by shrinkage in the model. When area-based explanatory variables are excluded, there are no significant LSOAs.

When area-based explanatory variables are included, two MSOAs produce a negative significant effect, indicating a beneficial effect of UC associated with housing insecurity (Great Chell & Packmoor, 5 respondents, and Bassetlaw 016, 2 respondents). When area-based explanatory variables are excluded, there are four significant MSOAs, all of which have a negative effect indicating that UC is associated with fewer people in housing arrears in these areas. These MSOAs are Egerton Park (4 respondents), Langney West (10 respondents), Corby Kingswood (10 respondents), Durrington North (5 people). These areas cover a range of economic characteristics, including areas with both low (Bassetlaw (ONS, 2023a)) and high levels of unemployment (Langley in Eastbourne (East Sussex County Council, 2022) and Egerton Park in Birkenhead ((Centre for Cities, 2023)), and areas that have undergone post-2000 economic redevelopment (Durrington in Worthing (Worthing Evolution, 2006) and Corby (Davies, 2016)).

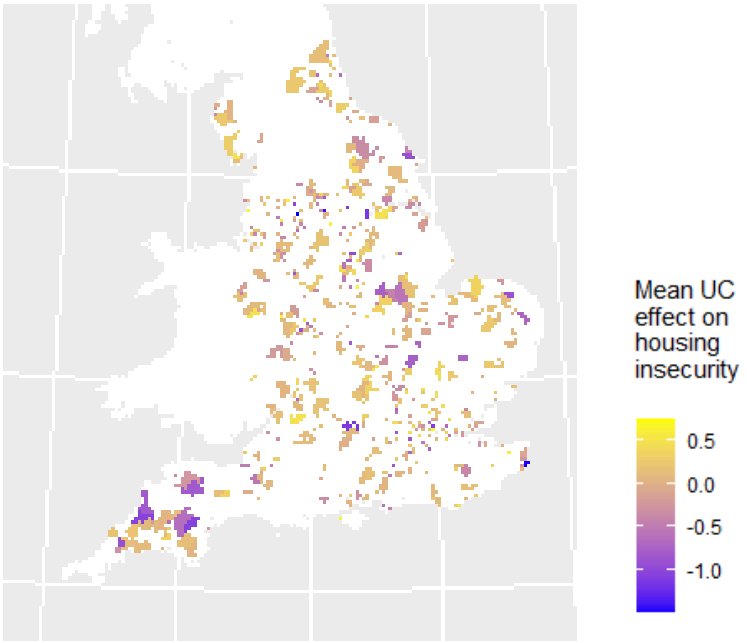
3.4.5 Child Tax Credit results

Figure 3.5 Effect variation across LSOAs and MSOAs for CTC comparison group



For most sample groups (HB, JSA, IS, ESA and WTC) there is no significant UC effect (Appendix 12), indicating that there is no effect in the average area unit, but instead a variability in that effect across areas, with high positive or negative effects in particular places. Child Tax Credit differs notably from this pattern, with the effect of UC remaining significant when the multilevel structure and area-level random slopes are applied. The shift to Universal Credit among this group of claimants is associated with an overall strong and significant increase of 55% in the odds (0.44 log odds) of experiencing housing payment problems. The effect of Universal Credit on housing insecurity varies across LSOAs in the CTC comparison sample from -0.9 to 1.64 (including MSOA-level random slopes) or -1.73 to 1.94 (excluding MSOA-level random slopes). In contrast to the overall sample, significant variation is present in the CTC model results at the MSOA level (Figure 3.5), with the UC effect varying from -1.48 to 0.73. This indicates that variation in the effect of Universal Credit on housing insecurity for the CTC group varies at both a micro-neighbourhood scale (LSOA = 650 households) and a wider neighbourhood scale (MSOA = 4000 households), with clustering of Universal Credit-related housing insecurity potentially taking place across larger geographical areas than in other benefit groups.

Figure 3.6 Map of the mean effect of the introduction of Universal Credit on housing insecurity in MSOAs in England among the CTC comparison group



Visualising the spatial distribution of the effect of UC on housing insecurity in different MSOAs among the CTC comparison group (Figure 3.6) reveals a similar spatial distribution to that of LSOAs in Figure 3.4. MSOAs with overall positive or negative UC effects on housing insecurity can be found in all parts of England, and areas with very different UC effects can be found in close proximity to one another.

When area-based explanatory variables are included, three LSOAs are significant with a positive effect indicating harmful UC effect (Bracknell Forest 006C, Barrow-in-Furness 001B, and Erewash 003D). Bracknell Forest is notable for being a generally affluent area with pockets of high deprivation (MHCLG, 2019). Barrow-in-Furness has levels of unemployment and benefit claims above the national average (ONS, 2023b). Both Barrow-in-Furness and Erewash include post-industrial areas, where previously prominent industrial and manufacturing sectors have diminished. When area-based explanatory variables are excluded, only Erewash 003D remains significant. As before, the significant LSOAs have small samples with only two respondents living in each LSOA, limiting the robustness of these results.

Unlike the overall sample, the majority of MSOAs generate a statistically significant result (Appendix 14), further indicating an important variation at the MSOA level in the effect of UC on housing insecurity among the CTC comparison group. MSOAs with the highest positive

UC effects indicating harmful UC effect (Appendix 15) include several London boroughs and areas with high levels of deprivation (e.g. Blacon, a large council estate area (Cheshire West and Chester Council, 2022)). MSOAs with the highest negative UC effects (Appendix 15) indicate that UC is associated with fewer people in housing arrears include several post-industrial areas (e.g. Rochdale, Dalton in Huddersfield, and Stainforth) and several areas with high levels of affluence or employment (e.g. Amblecote and Canterbury (ONS, 2023c)).

3.5 Discussion

This study tested the relationship between the introduction of Universal Credit and claimants' ability to meet their rental costs in comparison to legacy benefit claimants at several geographical levels, in order to identify at which spatial scales significant variation in the effect of Universal Credit on housing insecurity occurs. The results indicate that the highest variation occurs at the lower-level geographies of MSOA (4000 households) and LSOA (650 households), within larger area units such as Job Centre districts and regions (2.7 to 9.2 million people). This variation is widely distributed, with large positive and negative impacts found in all parts of England, and different impacts often occurring within close proximity of one another (Figure 3.4). Significant variation in the impact of Universal Credit on the likelihood of housing insecurity was found when compared to all legacy benefit comparison groups (HB, JSA, WTC, CTC, ESA and IS), although the extent of this impact and the individual characteristics increasing vulnerability differed for different samples. This corroborates recent findings of spatial inequality occurring between UK cities, towns, and neighbourhoods, particularly in the varied impact of changes in social and housing policy (Beatty, Cole, Foden & Powell, 2014, p2). The presence of spatial inequality in the impact of Universal Credit demonstrates further dissonance with the UK's highly centralised government system, contributing to ongoing criticism of the disparity between this centralisation and the heterogeneous nature of local governments and area conditions in the UK (McCann, 2020; Gray & Barford, 2018; Blaseio and Jones, 2019). This is perhaps expected given the way in which current policy requires national-level welfare and austerity measures to be implemented at a local level without adjustment for local inequalities such as high local levels of unemployment or welfare dependence (Gray & Barford, 2018) or capacity to cope with economic changes. The impact of this national-local mismatch is a perpetuation of spatial inequality, with an individual's vulnerability to Universal Credit-related housing insecurity varying based on the MSOA or LSOA in which they live.

The stratification of the analysis across multiple legacy benefit comparison groups and the inclusion of individual and area-level control variables enables insight into the intersection of vulnerability to Universal Credit-related housing insecurity. The effect of Universal Credit on housing insecurity varies across LSOAs in the overall sample from -0.27 to 0.48, with slightly wider ranges of variance across the legacy benefit comparison groups. While insights into particular LSOAs and MSOAs are limited due to the small sample size available at these spatial scales, some potential trends were identified regarding the characteristics of areas that fared particularly well or badly in the move to Universal Credit. An association was found between the move to Universal Credit and increased likelihood of housing payment

problems in some areas with high unemployment and poverty rates (e.g. Wall End Newham in East Ham). The move to Universal Credit was associated with fewer people in housing arrears in some areas that have undergone significant post-2000 economic redevelopment (e.g. Corby and Worthington), suggesting a potential link between the success of Universal Credit and the provision of regeneration resources. While the model does not provide substantial evidence of what drives the geographical variances across most of the sample, existing literature suggests that potential drivers include the geographical distribution of benefit claimants and economic deprivation (Hamnett, 2014; Beatty & Fothergill, 2013; Roberts & Taylor, 2019), the varying impact of austerity measures and resultant differences in local capability to adapt to economic shocks and changes (Gray & Barford, 2018; Hastings, Bailey, Bramley & Gannon, 2017), and changes in low-level geographical economic patterns such as the centralisation and decentralisation of poverty in different place types (Zhang & Pryce, 2020; CLES, 2014).

Respondents' vulnerability to housing insecurity is also related to personal characteristics. The most frequently highlighted characteristics associated with an increased risk of housing insecurity were living in social housing, as opposed to a private rental, and having a long term health condition or disability. The higher vulnerability among social renters may reflect a compositional effect, as allocation policies mean that social housing is provided to more vulnerable people with higher rates of financial precarity (Hickman, 2021). However, another potential driver of the association between social renting and increased likelihood of experiencing housing payment problems is the presence of higher flexibility and understanding of precarity in some social rental arrangements, particularly in comparison to the private rental sector. A 2012-2014 DWP survey of social renters (Kemp, 2014) highlighted a perceived lack of landlord pressure, belief that severe consequences such as eviction were unlikely, and landlords' understanding of the benefit system as drivers behind some tenants' late payment or underpayment of rent. In particular, survey respondents experiencing financial hardship linked this perceived flexibility to an increased capacity to afford essentials such as food and avoid severe material deprivation. While higher vulnerability and financial precarity are certainly disproportionately experienced by social renters, the relationship between social renting and higher housing payment problems also potentially reflects a strength of the social housing system in terms of increased flexibility for tenants.

Having a long term health condition or disability was a significant factor related to housing payment problems in all models other than the Employment and Support Allowance model - as ESA is a benefit for people unable to work due to illness or disability, the disability

variable is likely to apply to the whole sample and therefore not appear as significant in the findings. There is a strong body of existing literature demonstrating an association between Universal Credit's impact on financial hardship and disability (Stacey, 2020, p23; Reeves & Loopstra, 2017, p7; Cheetham, Moffatt & Addison, 2018, p34), with disabled claimants experiencing increased risk of financial hardship in the Universal Credit system. This result therefore corroborates these previous findings and further demonstrates its wide-ranging effect, as increased vulnerability to housing insecurity linked to long term health conditions or disability applies across all previously distinct legacy benefit populations. This varied vulnerability is misaligned with the centralised and homogenous nature of the Universal Credit system, potentially leading to further unequal housing outcomes.

Several region-comparison group intersections of vulnerability were identified. Income Support claimants living in the North East of England were identified as at a significantly higher risk of housing insecurity (Appendix 12.3). Previous studies have highlighted the North East as particularly dependent on the welfare system and susceptible to its changes as a result of post-industrial decline and high levels of unemployment and disability (Beatty & Fothergill, 2013; Roberts & Taylor, 2019). As Income Support is a benefit for people on low or no income, individual and area-level precacity intersect significantly here, increasing the risk of financial hardship and shock caused by changes in the welfare system, such as the transition to Universal Credit. Housing Benefit claimants living in London were also found to be at higher risk of experiencing housing insecurity (Appendix 12.1). We can associate this with the high cost of housing and particularly large proportion of London's population claiming housing-related benefits (CLES, 2014, p9), making it disproportionately dependent on housing-related welfare and changes in housing policy (Hamnett, 2014, p500; Beatty & Fothergill, 2013, p16). The population previously served by Housing Benefit in London are therefore at particular risk at experiencing rental payment problems and housing insecurity shocks as the housing support system shifts to Universal Credit.

While the overall sample and most legacy benefit comparison groups indicated much more variation at LSOA level (within MSOAs) than between MSOA, the Child Tax Credit comparison group had a different pattern, with particularly significant levels of variation occurring at MSOA level. This indicates an especially high risk of spatially unequal impacts on housing insecurity for people who would have previously claimed Child Tax Credit under the new Universal Credit system, with housing insecurity clustering at both a broad and micro neighbourhood level. While the drivers behind this difference are not investigated in this study, it may be linked to differing characteristics among the Child Tax Credit population compared to other benefit types, in particular the intrinsic prevalence of families with children

among this population, and the additional burden of the two child limit for Child Tax Credit claimants (Hobson, 2022). Areas with a particularly significant association between the move to Universal Credit and increased likelihood of housing payment problems included several post-industrial areas, areas with high unemployment or deprivation levels, and London boroughs. Areas in which the move to Universal Credit was associated with fewer people reporting housing affordability problems also included some post-industrial areas, but also included several areas with high levels of affluence and low levels of unemployment.

3.5.1 Recommendations and limitations

The findings of this study demonstrate the range of vulnerability to housing insecurity among benefit claimants based on their personal characteristics and where they live. There is a dissonance between this variety and the centralised homogeneous nature of the Universal Credit system, which replaces previously distinct legacy benefits aimed at different populations presenting different needs with a one-size-fits-all welfare system. This dissonance results in unequal effects, with the transition to Universal Credit resulting in different financial and housing outcomes for claimants in different population groups or places. The recommendations of this paper therefore focus on reducing the inequality in Universal Credit's impact on housing insecurity through benefit administration, support and research that take differences in population and place into consideration.

Previous studies have recommended policy change to make Universal Credit more flexible, such as reinstating previously removed or reduced disability-related premiums, providing more flexible options for the payment of housing costs, removing the required 5 week wait for payment, and protecting the housing element of UC from sanctioning (Cheetham, Moffatt & Addison, 2018, p38; Stacey, 2020, p8). These measures would not only support claimants whose personal characteristics make them more vulnerable to Universal Credit-related housing insecurity (such as people with disabilities), but would potentially mitigate further vulnerability associated with an intersection between personal characteristics and place. More targeted support in the form of increased flexibility or higher financial awards may also benefit people in these intersections, such as previous Income Support claimants in the North East and previous Housing Benefit claimants in London. At the core of this recommendation is the need to integrate the heterogeneity of the people and places it serves into the Universal Credit system and its implementation, enabling it to respond more flexibly and appropriately to the different needs of different populations and geographies.

The key finding of this study is the significant level of variance in the effects of Universal Credit on housing insecurity between different MSOAs and LSOAs. As with personal characteristics and their intersections with places, the presence of varied effects at lower-level geographies evidences inequality in the Universal Credit system and a misalignment with Universal Credit's centralised nature, resulting in unequal housing outcomes for its claimants. Areas identified in the findings as associated with significantly positive or negative effects of Universal Credit suggest that some areas with higher levels of deprivation or unemployment may be at higher risk of increased housing insecurity associated with the move to Universal Credit. However, while the current paper highlights

the variance, it does not fully investigate the drivers behind this spatial inequality or what characteristics make an MSOA or LSOA more vulnerable to Universal Credit-related housing insecurity. Potential drivers include the different demographic make-ups of MSOAs and LSOAs, such as employment and benefit reliance, the different associated needs of populations, and the varied capacity for areas to absorb and adapt to economic shock and policy change. Further research is therefore required into the mechanisms behind the spatial inequality in Universal Credit's effect on housing insecurity between different MSOAs and LSOAs.

In particular, it would be valuable to further investigate whether associations exist between vulnerability to Universal Credit-related housing insecurity and the distribution of benefit claimants and economic deprivation, the local effects of austerity and ability to absorb economic shocks, or patterns of the centralisation or decentralisation of poverty. Questions remain around the drivers of high spatial inequality in the impacts of Universal Credit on housing insecurity for families who would previously have claimed Child Tax Credit. As variance has been identified at lower rather than large area levels, this research should focus on local characteristics rather than broader characteristics like regional markets. By identifying the potential causes of area-level variance, it would then be possible to target more effective area-based policy change or support, potentially reducing the disproportionate levels of housing insecurity experienced by claimants in particular places.

The use of Understanding Society data provides a broad and representative sample for analysis, but also necessitates several limitations to this study. While using self-reported difficulties in meeting housing payments as a dependent variable provides insights into a conceptualisation of housing insecurity in relation to affordability and economic hardship, the use of a household survey requires the exclusion of more extreme but less prevalent housing outcomes such as street homelessness and some forms of temporary accommodation. The conceptualisation of housing insecurity employed in the paper is therefore appropriate for the current research focus, but may not be applicable to people experiencing more extreme and vulnerable housing situations. Although Understanding Society provides a large and representative sample of the UK population, when further moderated by benefit comparison group and location, some subgroups at LSOA level contain small numbers of participants. Repeating a similar study on larger or alternative data sources would therefore be beneficial in verifying the results, particularly at low-level geographies.

Finally, the study does not make use of any variables relating to the COVID-19 pandemic

despite including data from 2020, and may therefore omit ways in which the pandemic affected benefit claimants' housing situations, particularly in terms of how these effects may have varied by population or area characteristics. The Understanding Society COVID-19 studies (Understanding Society, *COVID-19*) provide a strong foundation for this analysis, as they include data on evictions, difficulties meeting housing payments, and detailed questions on Universal Credit claims. A future study is therefore recommended into how Universal Credit-related housing insecurity and its relationship to population and place may have changed within the COVID-19 UK setting, including the effects of policy changes in response to the pandemic.

3.6 Conclusions

A wealth of research exists demonstrating the deeply entrenched presence of spatial inequalities in the UK across several geographical levels. These inequalities both interact with and are enacted through welfare and housing policy, which is frequently highly centralised. The current transition in the UK welfare system to Universal Credit is similarly centralised, applying largely inflexible welfare structures to claimants across a variety of populations, places, and support needs. This key aim of this study was to investigate how this homogenous policy interacts with the spatially heterogeneous country it serves by identifying geographical variation in the effect of Universal Credit on housing insecurity. The findings indicate significant variation at the lower-level areas of MSOAs (average 4000 households per unit) and LSOAs (average 650 households per unit). By stratifying the study across the multiple benefit populations affected by the transition to Universal Credit, I further demonstrated that this variation applies to most claimant populations, and is therefore a widespread feature of the shift to the Universal Credit system.

The findings also provide insights into which individual and area-level characteristics are associated with an increased vulnerability to housing insecurity, highlighting significantly vulnerable intersections between specific population groups and characteristics. While individual characteristics were generally found to be more significant in affecting claimants' risk of housing insecurity than area-level characteristics, notable intersections were identified for previous Housing Benefit claimants living in London and previous Income Support claimants living in the North East, who were at increased risk of experiencing rental payment difficulties. Furthermore, particularly high variation in the effect of Universal Credit on housing insecurity among families who would previously have claimed Child Tax Credit was identified at an MSOA-level.

The misalignment between the current centralised nature of the Universal Credit system and the heterogeneity of the populations and places to which it is applied leads to harmful and unequal economic outcomes for many of its claimants. A crucial way in which this harm manifests is through the risk of housing insecurity, which is heightened for certain populations, places, and intersections between the two. As of January 2022 there were 5.6 million Universal Credit claimants (DWP, 2022b), with a further 2.6 million legacy benefit claimants set to transition to the Universal Credit system in the coming years as part of the 'Managed Migration' programme (DWP, 2022c). The unequal effects on housing insecurity associated with Universal Credit therefore have far-reaching consequences, affecting an increasing proportion of the UK population. In order to better understand and reduce these

effects, it is essential to target economic support for especially vulnerable populations, introduce more flexibility and recognition of different populations and places into how Universal Credit is structured and implemented, and further develop our understanding into the mechanisms causing geographical variance in Universal Credit's effects on housing insecurity, particularly at low-level geographies.

Chapter 4 Resilience and Inequality in the UK Housing System: The Scarring Effects of Post-2000 Economic Shocks on Housing Insecurity

Abstract: This study investigates the persistence of the effects of the Global Financial Crisis on housing insecurity among social renters, private renters, and mortgaged homeowners in England, and compares this persistence to the effects of the 2012 welfare reforms. I applied a fixed effects logistic regression research design to two Understanding Society data samples, subset to include several years before and after each economic event. This enabled the comparison of housing insecurity trajectories and the effects on housing insecurity associated with each event to identify potential differences and similarities in their impacts. Findings demonstrated a significant persistent rise in housing payment problems around the time of the Global Financial Crisis, followed by a gradual decline until a small peak around the time of introduction of the UK welfare reforms. Housing insecurity among renters, particularly social renters, has recovered the least since the GFC and was most vulnerable to spikes connected to the welfare reforms.

4.1 Introduction

In the previous two chapters I focused on the causal impacts of welfare reforms in the UK on housing insecurity. In this chapter, I broaden the investigation to consider how another major economic shock, the 2008 Global Financial Crisis, impacted housing insecurity. In particular, I explore how an economic shock can lead to "scarring" effects in the form of heightened housing insecurity for households that persist long after the shock has ended, and how these impacts vary by demographic and spatial characteristics.

The 2008 Global Financial Crisis (GFC) had wide-ranging impacts on the global economy, with long-lasting impacts in terms of reduced growth in economic outputs and productivity. These included immense and long-lasting effects on UK housing markets and insecurity, such as a short-term increase in extreme housing insecurity in the form of repossessions (Scanlon & Elsinga, 2013) and more long-term damage to housing opportunities such as access to affordable homeownership (Kennett, Forrest & Marsh, 2012). These impacts were not experienced equally, with certain places and populations such as private renters exhibiting disproportionately high vulnerability to post-GFC harm (Whitehead & Williams, 2011). Since the GFC, the UK has experienced further economic shocks (such as the 2012 welfare reforms) with the potential to entrench the GFC's harmful economic impacts or generate similar additional impacts (Martin Fuentes & Moder, 2020; Bhattarai, Schwartzman and Yang, 2021).

In this study I explore the idea that recovery from the GFC was inhibited by the 2012 welfare reforms. While discussions around the similarities between the general economic impacts of post-GFC economic shocks and those of the GFC are prominent, there is currently little focus on how the post-event trajectory of housing insecurity might compare across these time periods. This study investigates the position of housing insecurity within this wider discussion, exploring how post-economic shock housing insecurity trajectories have materialised and how they interact with other aspects of the changing economic landscape such as employment and housing tenure. To do this, the study applies logistic regression analysis to Understanding Society and British Household Panel Survey data from 2003 to 2022, focusing on the dependent variable of whether the respondent has experienced housing payment problems in the 12 months prior to interview.

The research questions addressed by this study are:

- How persistent were the effects of the Global Financial Crisis on housing payment problems in England?
- How do the 2012 welfare reforms interact with the post-Global Financial Crisis housing trajectory in England?
- How does the likelihood of post-economic shock housing insecurity vary by tenure?

These questions relate two crucially important concepts associated with the UK housing system and strategic reform of housing policy: resilience (how quickly and comprehensively the housing system bounces back from major shocks), and inequality (the extent to which resilience is evenly distributed in the housing system).

The findings of the study indicate that the 2008 Global Financial Crisis was indeed associated with a large and persistent increase in levels of housing insecurity in the UK. The 2012 welfare reforms are not associated with such an extreme and long-lasting change, but interrupt the post-GFC recovery trajectory through temporary increases in housing insecurity. This demonstrates the potential for economic shocks to further entrench the harmful post-GFC effects on the UK's housing landscape, disrupting or slowing recovery. Additionally, the effects of both economic shocks are not experienced equally across the population. The results demonstrate spatial and demographic inequalities in post-economic shock housing insecurity impacts, with renters (particularly social renters) experiencing higher vulnerability to changes in the economic and housing landscape. Some population groups are particularly vulnerable to certain economic shocks, such as people with disabilities experiencing disproportionate levels of housing insecurity risk at the times of the welfare reforms. This indicates that as well as affecting the overall trajectory of housing insecurity, individual economic shocks interact with particular populations differently and may have heterogeneous effects on their likelihood of experiencing housing insecurity.

This study provides a significant and original contribution to the literature by considering the longitudinal trajectories of housing insecurity, and the comparative effects of different potential economic shocks, using quantitative data. The inclusion of emerging effects on housing insecurity associated with ongoing welfare reforms makes this analysis particularly relevant. The use of longitudinal data covering a broad timeline enables a rigorous and robust investigation of housing insecurity before, during, and after significant economic shocks. The key insights generated by the research are the heterogeneity in the vulnerability of places and populations in different economic contexts, the identification of current and emerging vulnerable groups at particular risk of housing insecurity following economic shocks, and the need for flexibility in how we research and support different people during

times of economic change or crisis. The international nature of the Global Financial Crisis means these findings are relevant internationally: these findings may be valuable for other countries with similar economic or housing markets, or where similar economic shock response policies were employed.

4.2 Literature review

4.2.1 Economic scarring and the Global Financial Crisis

The 2007-2008 Global Financial Crisis was a period of worldwide economic crisis triggered by the collapse of subprime mortgage and housing markets in the USA. The crisis generated severe short-term damage to UK housing markets, including significantly reduced property values, transactions, and construction (Whitehead & Williams, 2011, p1161), higher lending requirements for house buyers (Jones & Richardson, 2014, p139), and a peak in the number of repossessions of mortgaged properties (Scanlon & Elsinga, 2013, p340). Risk of negative housing outcomes such as repossession and the reduction of choice and stability surrounding housing decisions made this a period of instability not only for the overall UK housing market, but for many individual households during this time. The relationship between the Global Financial Crisis and housing insecurity also extends beyond its short-term impacts. Large-scale crises and significant economic downturns frequently lead to 'economic scarring', generating long-term economic damage to individuals and wider economies (Irons, 2009, P3). Economic scarring is a well-established consequence of the Global Financial Crisis across many nations, among which the UK experienced a relatively lengthy recovery period (Whitehead & Williams, 2011, p1157), with housing prices and transaction volumes recovering slowly from the shock (Whitehead & Williams, 2011, p1161).

The post-GFC downturn in UK housing markets is linked with several current trends in housing insecurity. The crisis and subsequent housing market responses were characterised by a growth in the private rental sector and an increase in households dependent on private rental for long-term accommodation (Kemp, 2015). The increased prominence of the private rental sector is problematic in a UK context because of high levels of insecure tenancies and unaffordable housing (Rhodes & Rugg, 2018; O'Leary, O'Shea & Albertson, 2018). Following the crisis, many UK households, particularly homeowners with mortgages, experienced an increased risk of household debt (Whitehead & Williams, 2011, p1166). Kennett, Forrest and Marsh (2012) link the financial crisis with long-term decreased housing opportunities (particularly in the form of affordable home ownership and rental costs) in the UK, privileging home ownership and limiting choice and mobility for much of the population. Whitehead & Williams (2011) argue that these features of housing insecurity did not originate from the Global Financial Crisis, but were pre-existing elements of the UK housing landscape that were exacerbated and further entrenched by the crisis (p1159). By further cementing the presence of housing problems such as reliance on the Private Rental Sector, debt, and

restricted housing opportunities, the Global Financial Crisis may therefore have both heightened their impact and increased their persistence.

4.2.2 Welfare Reform

The UK's more long-term response to the effects of the Global Financial Crisis took the form of the 2012 welfare reforms, introduced by the Conservative–Liberal Democrat coalition. The reforms aimed to reduce perceived welfare dependency and spending by centralising the welfare system and incentivising work (UK Govt., 2015). The reform package included significant changes such as the Benefit Cap, an upper limit on the total amount a household can claim in benefits, and the introduction of Universal Credit, an integrated benefit for all working age claimants, replacing a variety of legacy benefits to create one centralised system. The reforms have been linked to an increase in financial and housing precarity for some claimants, with particular associations found between moving to the Universal Credit and financial hardship and debt (Cheetham, Moffatt & Addison, 2018; Stacey, 2020). Research demonstrates that the effects of the reforms are spatially unequal (Chapter 2) and impact different populations in different ways (Chapter 3), with more vulnerable claimant groups such as people with disabilities experiencing disproportionate increased risk of financial and housing insecurity (Cheetham, Moffatt & Addison, 2018; Stacey, 2020).

Several studies have linked the introduction of the welfare reforms with intensifying the persistence of the Global Financial Crisis' long-term effects on financial and housing precarity in the UK. Scanlon and Elsinga (2013) characterise the welfare reforms as stagnating rather than reviving the post-GFC housing market in the UK. Kennett, Forrest and Marsh (2012) associate this dampening effect with the welfare reforms' reinforcement of pre-GFC trends in housing. In particular, they characterise the welfare reforms as part of an increasingly financialised model of housing in the UK, implemented though an increased burden on low-income renters (p23) and "personal and family resources" (p25). This aligns with a wider discourse linking the UK welfare reforms with ideological realignment, consisting of a shift from social security to active citizenship (Koch & Reeves, 2021, p3) and increased conditionality for social citizenship (Dwyer & Wright, 2014, p33). Through this lens, the welfare reforms can be positioned as continuing an earlier ideological realignment that preceded and perhaps contributed to the Global Financial Crisis (Whitehead & Williams (2011). This continuity further places the reforms as a key element in the persistence of the effects of the Global Financial Crisis.

4.2.3 More recent and future economic shocks

Insights into previous instances of economic scarring may shed light on the potential long-term consequences of current and future crises. Studies suggest that the global shock of the COVID-19 pandemic in particular may have similarities with the Global Financial Crisis in terms of its long-term general economic effects (Bhattarai, Schwartzman & Yang, 2021; Martin Fuentes & Moder, 2020). Khan, Khan and Shafiq's review (2021) of the pandemic's economic impacts on a global scale demonstrates widespread financial hardship due to job and income loss, contributing to a wider and persistent economic lag. This lag can be seen across numerous national economies, including in the UK (Hossain, 2021, P10; IMF, 2022, P4), and is expected to have a disproportionate effect on vulnerable populations (IMF, 2022, P3) such as low-income workers (P4) and new labour force entrants (P5). Other large-scale economic crises, such as the 2022 Russian invasion of Ukraine and the current UK cost of living crisis, will similarly have scarring impacts and interactions with other economic shocks. While currently available data does not allow for robust analyses of the scarring effects of these shocks, investigating the relationship between the economic shocks that precede them provides insights into what their impacts might be and who might be particularly vulnerable to them.

4.3 Methods and data

The study uses a combination of Understanding Society and British Household Panel Survey data from 2003 to 2022. This is a large, nationally representative panel study of households in Great Britain. This period covers the Global Financial Crisis (2008) and the UK welfare reforms (2012), as well as the years preceding and following these events. This enables us to investigate changes in housing insecurity before, during, and after significant economic crises and changes. The sample includes all working age (18-65) social or private renters or mortgaged homeowners, excluding outright homeowners. The scope of this study has been limited to working age respondents living in England to ensure like-for-like comparison, due to the particular focus of the UK welfare reforms on working-age people and differences in how housing and welfare policies are enacted in the other devolved nations.

The dependent variable of interest is a binary variable of whether the respondent has experienced housing payment problems in the last 12 months or not. Since it is binary, a logistic regression model was employed, using the conditional logistic regression function from the 'Survival' package in R (Therneau, 2022). This is equivalent to a fixed effects model, controlling for individual-level time-invariant differences between individuals, and only looking at within-individual variation - this is appropriate, given we are interested in how economic shocks may have affected individuals, and not changes in population over time which might be a result of other unmeasured factors. Two separate models were run using two subsamples of the data, made up of the years surrounding each of the two economic shocks. The resulting regression models demonstrate the relationship between each included variable and the likelihood of a respondent experiencing problems meeting housing payments. The independent variables included in the model are outlined in Table 4.1. Explanatory variables were selected based on existing research into factors influencing housing insecurity, with individual variables derived from Bramley and Fitzpatrick (2018). The model also includes individual respondents as fixed effects to control for unobserved heterogeneity.

Table 4.1 Table of variables and descriptive statistics for overall sample pooled over all data collection waves

Variable	Measurement	Mean	SD	Proportion	
				Response	*Proportion*
Housing payment problems (dependent)	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months			1/Yes	10%
				0/No	90%
Years Before/Since economic shock	Dummy variable of years before/since the economic shock being investigated in the model				
Housing tenure	Social rental, private rental, or owned with mortgage			Social	21%
				Private	19%
				Mortgage	60%
Employment status	Employed or not employed			Employed	74%
				Not employed	26%
Age bracket				18 to 20	6%
				21 to 24	8%
				25 to 34	21%
				35 to 44	27%
				45 to 54	24%
				55 to 64	14%
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition			Disability	24%
				No disability	76%
Housing Benefit	Whether the respondent claimed Housing Benefit at any time during data collection			Claims HB	9%
				Does not claim HB	91%
Income	Equivalised net monthly household income (unit: £1000)	1.59	1.72		
Number of dependent children in household		0.85	1.08		

4.3.1 Further analysis on tenure

Existing studies have emphasised the damaging effect of the Global Financial Crisis on private renters, characterised by an increased dependence on the private rental sector (Kemp, 2015; Kennett, Forrest & Marsh, 2012) and exposure to related issues of high levels of insecure tenancies and unaffordable housing (Rhodes & Rugg, 2018; O'Leary, O'Shea & Albertson, 2018). Similarly, Kennett, Forrest and Marsh associate the 2012 Welfare Reforms with an increased burden on low-income renters (2012). These studies indicate a potential variation in the experience of post-economic shock housing insecurity for people with different tenure types. The overall analyses in this chapter support this hypothesis, as illustrated by the different housing insecurity trajectories for private renters, social renters, and mortgaged homeowners (Figure 4.2). I therefore carried out further analysis on the variation in housing insecurity experiences by tenure, with a particular focus on the experiences of private and social renters. In order to determine how post-economic shock effects on housing insecurity differ by tenure in more detail, additional versions of the model were run with interactions between the number of years before/since an economic shock and tenure or rental costs (Section 4.4.4).

4.4 Results

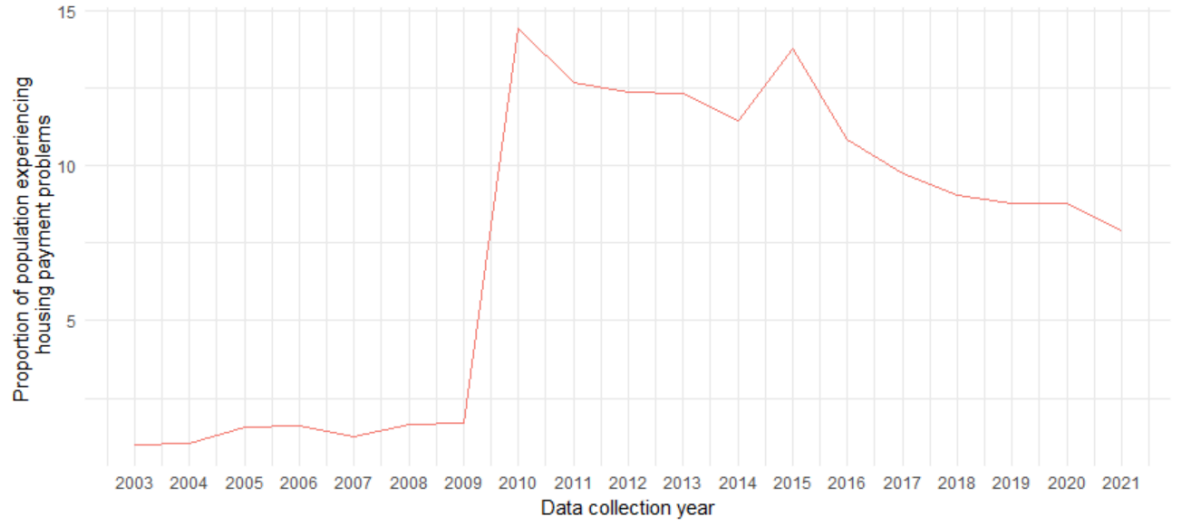
4.4.1 Visualisations of descriptive statistics

These visualisations show the proportion of Understanding Society respondents experiencing problems meeting their housing costs between 2003 and 2022. The notable economic shocks in this time period affecting the trajectory of housing insecurity were the Global Financial Crisis (from 2008) and the UK welfare reforms (from 2012).

4.4.1.1 Full sample

The full sample includes all working-age private renters, social renters, and homeowners with a mortgage. Between 1 and 1.7% of the pre-GFC sample experienced housing payment problems. Visualising the trajectory of housing insecurity for the full sample (Figure 4.1) demonstrates a large and statistically significant rise in housing payment problems at the time of the GFC to 14.4% of the sample, with very persistent effects. The impact of the GFC is followed by a gradual decline in housing insecurity until a small peak at the time of the 2015 national expansion of Universal Credit (DWP, 2021), the central policy change of UK welfare reforms. At this peak, 13.8% of the sample experienced housing payment problems, a 2.2% increase from the previous data collection wave. At the end of this period, the prevalence of housing insecurity remains at approximately twice the level reported before the GFC.

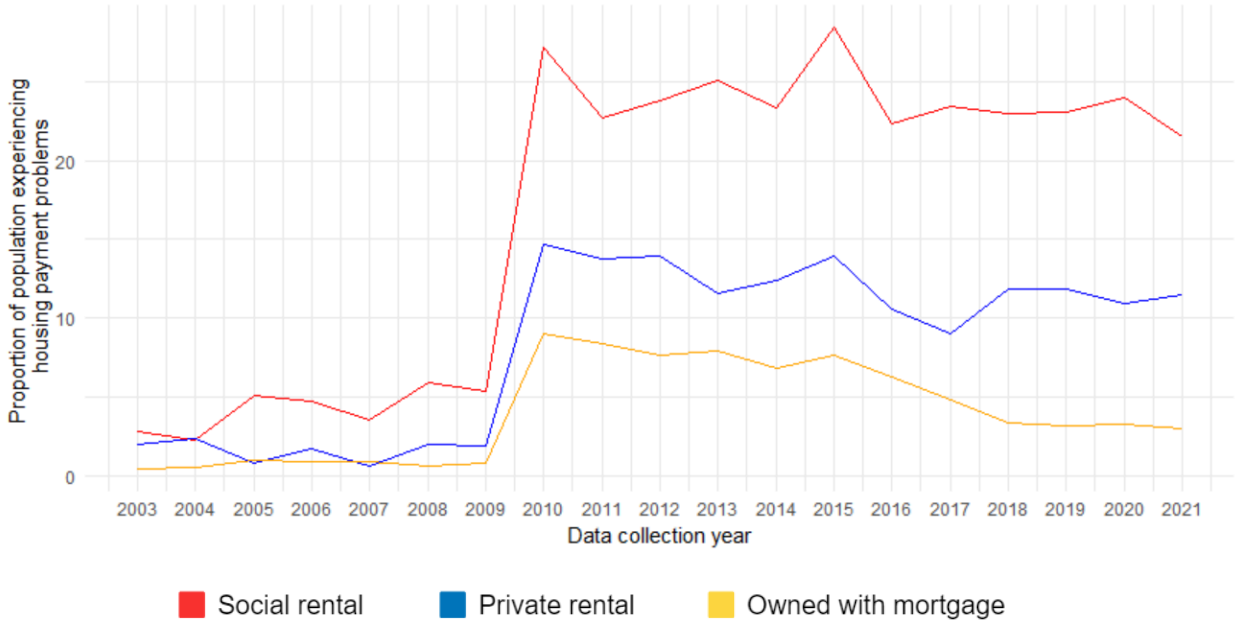
Figure 4.1 Housing insecurity trajectory for full sample (2003-2022)



4.4.1.2 Respondents by tenure

When the sample is broken down by tenure, differing experiences of housing insecurity emerge for private renters, social renters, and mortgaged homeowners (Figure 4.2). While all tenures experience a significant persistent rise in housing payment problems at the time of the GFC, this spike is more extreme for renters, particularly social renters. At the time of the GFC peak in housing insecurity, 9% of mortgaged homeowners in the sample experienced housing payment problems compared to 14.7% of private renters in the sample and 27.1% of social renters in the sample. Both private and social renters have also recovered less since the GFC and are more vulnerable to spikes connected to economic changes in comparison to mortgaged homeowners - this pattern is particularly severe for social renters.

Figure 4.2 Housing insecurity trajectories for full sample by tenure (2003-2022)



4.4.2 Logistic regression models

The GFC conditional logistic regression results (Table 4.2, full results in Appendix 16) indicate a stark difference between the periods before and after the beginning of the GFC. The likelihood of housing payment problems among the overall population rises sharply following the GFC, and remains significantly higher than pre-GFC in the following years despite an overall downwards trajectory. The likelihood of experiencing housing payment problems during this period is higher for respondents on lower incomes or with higher numbers of dependent children. A reduced likelihood of housing payment problems is associated with receiving Housing Benefit, indicating that Housing Benefit functioned effectively in mitigating respondents' housing problems during the GFC and its immediate recovery period, as well as before the crisis.

The welfare reform logistic regression results (Table 4.2, full results in Appendix 17) indicate a brief disruption in the overall downward trend of housing insecurity, with a brief spike in housing payment problems followed by a continued decline in line with the visualisation (Figure 4.1). As in the GFC model, a lower income is associated with an increased likelihood of experiencing housing payment problems, while claiming Housing Benefit is associated with a lower likelihood. During this period having a disability or living in socially rented accommodation are also linked with a significantly increased likelihood of housing payment

problems. Being in employment is also associated with an increased likelihood of housing payment problems, which may be linked to the welfare reforms' expansion of conditionality and sanctioning to in-work recipients, particularly through Universal Credit (Dwyer & Wright, 2014; Adler, 2018; Reeves & Loopstra, 2020), or to other features of employment such as precarious work or low wages.

Table 4.2 Logistic regression results for all samples

	GFC		Welfare reforms	
Variable	**Estimate**	**Std. error**	**Estimate**	**Std. error**
Data collection years				
2003	-0.62	0.23 **		
2004	-0.55	0.22 *		
2005	-0.11	0.2		
2006	-0.07	0.19		
2007	-0.34	0.2		
2008	-0.05	0.19		
2009-11	Reference			
2010-12	2.33	0.15 ***	0.26	0.04 ***
2011-13	2.24	0.15 ***	0.17	0.04 ***
2012-14	2.2	0.15 ***	0.13	0.04 ***
2013-15	2.19	0.15 ***	0.12	0.04 **
2014-16	2.06	0.15 ***	Reference	
2015-17			0.18	0.04 ***
2016-18			-0.17	0.04 ***
2017-19			-0.3	0.04 ***
2018-20			-0.39	0.05 ***
2019-21			-0.42	0.05 ***
Age bracket (reference category: 18-20)				
21 to 24	0.15	0.09	0.16	0.06 **
25 to 34	0.04	0.13	0.19	0.08 *
35 to 44	0.07	0.16	0.22	0.11 *
45 to 54	0.12	0.19	0.28	0.13 *
55 to 64	0.22	0.22	0.27	0.15
Employed	0.08	0.05	0.07	0.03 *
Income (unit: £1000)	-0.09	0.03 ***	-0.09	0.02 ***
Claims Housing Benefit	-0.14	0.05 **	-0.12	0.04 **
Disability	-0.01	0.04	0.07	0.03 *
Number of children	0.07	0.03 *	0.03	0.02
Private rental	-0.05	0.09	0.11	0.06
Social rental	0.12	0.1	0.3	0.07 ***

4.4.3 Relationship with employment

Being in employment was associated with an increased likelihood of housing payment problems in the welfare reforms model. To further explore the role of employment in housing insecurity, versions of the models were run with a variable of employment interacted with Years Before/Since event (Appendix 18). This interaction variable did not have a significant effect in the GFC model, indicating that the change in the likelihood of experiencing housing insecurity did not differ significantly between employed and unemployed people. In the welfare reform model, the interaction variable was associated with increased housing insecurity before the event and associated with decreased housing insecurity after the event. This indicates that in the period following the introduction of the welfare reforms, the likelihood of experiencing housing insecurity among employed people decreased compared to unemployed people.

4.4.4 Experiences of private and social renters

4.4.4.1 Tenure

Mortgaged homeowners, private renters, and social renters experience similar housing insecurity trajectories before and after the Global Financial Crisis (Figure 4.3). Tenure has a significant relationship with housing insecurity in the welfare reforms models, with social renters experiencing higher likelihood of housing payment problems (Table 4.2). When interacted with Years Before/Since event, the size and significance of this effect increases for both social and private renters in the years following the welfare reforms. The divergence of the mortgaged homeowners trajectory from the rental trajectories is particularly noticeable from 3-4 years after the beginning of the reforms, at which point Universal Credit was more widely rolled out and affecting a larger proportion of the population. While the overall sample shows a decline in housing insecurity following the initial post-reform spike (Figure 4.1), tenure interactions demonstrate a smaller decrease for both private and social renters in the years after the reform (Figure 4.4, Appendix 19). This indicates that both private and social renters experienced a less favourable recovery pattern than mortgaged homeowners following the Welfare Reform and were more vulnerable to persistent harmful effects.

Figure 4.3 Prediction plot for Tenure-Year interaction (Global Financial Crisis)

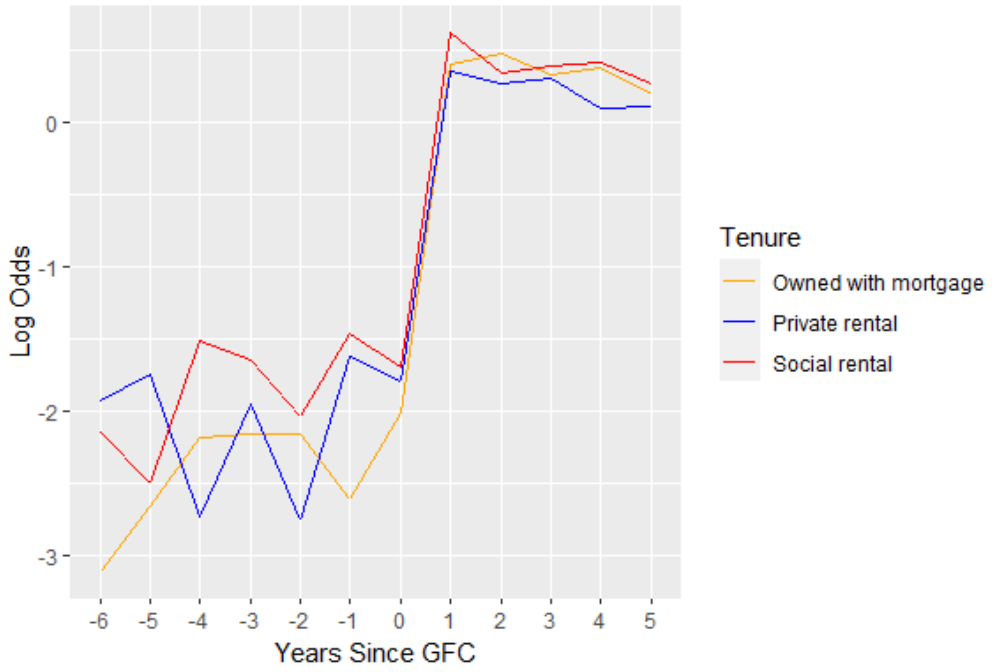


Figure 4.4 Prediction plot for Tenure-Year interaction (Welfare Reform)

4.4.4.2 Rental costs

Private and social renters were highlighted as experiencing particularly high likelihoods of housing insecurity (Section 4.4.4.1). While there are many potential drivers for this increased likelihood, affordability is particularly relevant to the scope of this thesis due to the use of an affordability-related dependent variable and wider evidence of unaffordability in the UK rental market (Rhodes & Rugg, 2018; O'Leary, O'Shea & Albertson, 2018). To further investigate the role of affordability in the housing insecurity experiences of private and social renters, versions of the models were run on just the private and social renters in the sample including rental costs interacted with Years Before/Since event (Appendix 20). In the years following the welfare reforms, lower rental costs were significantly linked with increased risk of housing payment problems. This could reflect a compositional effect, with higher vulnerability and precarity among renters living in cheaper housing or renters with limited access to welfare support (e.g. younger people who are only eligible for the room rate of Housing Benefit). It may also be linked with policy change causing reduced support from the benefit system, leaving some benefit claimants living in low-cost accommodation with lower benefit income and diminished ability to meet their housing costs.

4.5 Discussion

This study set out to explore how the effects and persistence of the 2008 Global Financial Crisis in relation to housing insecurity in England compare with the effects of the 2012 welfare reforms. The findings demonstrate a huge peak in housing insecurity associated with the GFC, with the likelihood of experiencing housing payment problems increasing by ten times immediately after the crisis, leaving 14.4% of the overall sample experiencing housing payment problems at this time. Following this spike, the post-GFC housing insecurity trajectory has been characterised by an overall gradual decline. However, the effects have been persistent, with levels of housing insecurity remaining significantly higher than pre-GFC levels. This finding is situated within a wider context of persistent long-term damage to the UK economic landscape (Whitehead & Williams, 2011) and housing markets (Jones & Richardson, 2014; Kennett, Forrest & Marsh, 2012). The findings indicate that the GFC's effects on housing have not been experienced equally across populations, with demographic variations in the size and persistence of its impacts.

The presence of long-term economic damage is not something exclusive to the 2008 Global Financial Crisis, but is widely characteristic of other significant economic shocks (Irons, 2009). By viewing post-GFC economic shocks through this same lens, this study aimed to investigate the housing insecurity trajectories following the 2012 welfare reforms in comparison to the GFC's large and persistent effects on housing insecurity. Our findings indicate that the overall effects of the welfare reforms are smaller than those of the GFC. The welfare reforms are associated with a brief disruption in the overall post-GFC downward trend of housing insecurity, with a spike in housing payment problems followed by a continued decline. This suggests that while the welfare reforms did have damaging effects on housing security in England, these effects were less extreme and distinct than those of the GFC, and are instead characterised by their temporary disruption of the long-term recovery from the GFC.

Through the inclusion of explanatory variables, the study has explored what economic household characteristics are associated with housing insecurity. Claiming Housing Benefit is consistently associated with a lower likelihood of housing payment problems, indicating that it has generally functioned effectively as a safety net against housing insecurity. As Housing Benefit is currently being phased out and replaced by Universal Credit (which contains a housing support element), this safety net is potentially at risk. While rental costs were not generally significantly associated with likelihood of housing payment problems, lower rental costs were significantly associated with a small increased risk of housing

insecurity in the years following the welfare reforms. This may be linked with reduced support from the benefit system, leaving some benefit claimants living in relatively low-cost accommodation with lower benefit income and diminished ability to meet their housing costs. In combination, the findings around Housing Benefit and post-welfare reform demonstrate a particular vulnerability among benefit claimants to changes in the welfare system, with the introduction of the welfare reforms and ongoing movement away from legacy benefits to the Universal Credit system leaving claimants at potential risk of increased housing insecurity. This finding supports wider recent research demonstrating the relationship between Universal Credit and financial hardship (Cheetham, Moffatt & Addison, 2018; Stacey, 2020; Reeves & Loopstra, 2020; Adler, 2018; Webster, 2022).

As well as economic factors, individual characteristics at times affected respondents' likelihood of experiencing housing payment problems. The demographic characteristics associated with higher risk of housing insecurity varied across the economic shocks. Having a larger number of dependent children was associated with an increased likelihood of experiencing housing payment problems in the wake of the GFC. Having a disability or long term health condition was associated with increased risk in the welfare reform model. This indicates an increased vulnerability for people with disabilities during this period, with the welfare reform impacting the income of some claimants of disability-related benefits (Stacey, 2020; Reeves & Loopstra, 2017; Cheetham, Moffatt & Addison, 2018). In the welfare reforms model, employment interacted with Years Before/Since event was associated with a greater likelihood of housing insecurity pre-shock and associated with a smaller likelihood of housing insecurity post-shock. In the period following the introduction of the welfare reform, the likelihood of experiencing housing payment problems therefore increased more drastically for unemployed people than employed people, meaning that being unemployed was linked to a higher vulnerability to a *change* in this risk.

Differences in experiences of housing insecurity across both economic shocks are particularly vivid for differently tenured households. While all tenures experienced a significant persistent rise in housing payment problems at the time of the GFC, renters (particularly social renters) experienced an especially high spike in housing insecurity and slow recovery from the shock. Social renters experienced higher likelihood of housing payment problems at the time of the welfare reforms. When interacted with Years Before/Since event, the effect of tenure also increases for private renters immediately following the welfare reforms, demonstrating an increased vulnerability to housing insecurity for both private and social renters in the wake of this economic shock. As well as showing that renters are more vulnerable to changes in housing security following an economic

shock, this finding indicates that both private and social renters are likely to experience slower housing recovery from economic hits than mortgaged homeowners. As in Chapter 3 (Section 3.5), the association between social rental and higher housing payment problems may also be influenced by a compositional effect, whereby more vulnerable and financially precarious households are allocated social housing (Hickman, 2021), and a perceived flexibility among some social renters in terms of the pressure to and consequences of late or incomplete rent payments, enabling them to prioritise essential costs such as food (Kemp, 2014).

4.5.1 Recommendations and limitations

The findings of this study indicate that the interaction between economic shocks and housing insecurity vary in the size and persistence of their impact. Not only does this impact further vary by households' economic, demographic and spatial characteristics, but certain characteristics are more significantly associated with housing payment problems during some economic shocks than during others. These results provide us with insights into which populations may be most vulnerable to housing insecurity throughout the recovery from past economic shocks, and how vulnerability might be distributed in current and future economic shocks. The recommendations therefore focus on identifying this vulnerability, targeting support during and after economic shocks, and conducting research that takes the variation in vulnerability to housing insecurity during different economic shocks into account.

In order to facilitate economic recovery and ease housing insecurity in the wake of recent economic shocks, particularly through the sustained impacts of the Global Financial Crisis, I recommend that housing practitioners and policymakers provide particular support for renters, unemployed people, and people with disabilities, as they are especially vulnerable to post-economic shock housing insecurity. The increased vulnerability of these groups is potentially linked to the 2012 Welfare Reforms, during which welfare support for these populations became more conditional and more highly sanctioned. By contrast, claimants of the pre-reform legacy Housing Benefit consistently experienced less housing payment problems in this study. I therefore recommend that the current welfare support for these vulnerable groups is strengthened, perhaps drawing on features of the more robust Housing Benefit system. Potential strengthening measures may include higher financial awards, increased policy flexibility, and decreased sanctioning. A more flexible and robust welfare system that is able to more effectively accommodate the heterogeneous population it serves would increase the capacity of vulnerable groups to absorb and recover from economic shocks.

Robust insights into the housing insecurity effects of the COVID-19 pandemic are not possible at the time of this study due to the existence of only three years of post-event data. The short timeframe of this data means that effects have not fully materialised and cannot yet be identified. This is particularly the case for the pandemic, as harmful outcomes may have been deferred by policy interventions, such as evictions being prevented by policy during the pandemic then taking place when the policy lifted (Vilenica et al, 2020). A similar study to this chapter is therefore recommended into the post-pandemic trajectory of housing insecurity in the UK as more data becomes available. It may be valuable to focus this research on populations identified as vulnerable to economic shocks in this study, particularly renters, people on low incomes, and people with disabilities. Similarly, these populations may provide useful starting points for research into current and future economic shocks (e.g. the UK cost of living crisis) and how to effectively reduce their housing insecurity impacts. However, as this study identified heterogeneity in how economic and demographic characteristics interacted with different economic shocks, we might expect similar variation in future events. I therefore recommend case-by-case research into how current and future economic shocks interact with and affect housing insecurity, and how these effects may vary for different population groups.

When considered in a wider research context, Chapter 4 generates several potential paths for future research. While spatial variation was not included in the research scope of Chapter 4, considering its findings in light of Chapter 3's illustration of spatial variation in policy effect raises interesting questions about how much the effects of economic shocks on housing insecurity vary by place, at what levels variation occurs, and what this might mean in terms of unequal impact and vulnerable populations. Chapter 4 also potentially opens up an avenue of international and comparative research into the scarring effects of major shocks on housing insecurity, as large economic shocks such as the Global Financial Crisis frequently have an international effect. Our striking results in the UK context highlight the imperative to deepen and broaden research around the resilience of housing systems to major economic and policy shocks. A potentially important avenue for future research will be to compare the scarring effects in the UK with other countries with a view to understand what features of housing systems help improve resilience and reduce inequalities in scarring prevalence.

4.6 Conclusions

This study explored the trajectory of housing insecurity in England between 2003 and 2022, investigating its interactions with economic shocks and demographic characteristics. By providing a comparative analysis of post-2000 economic shocks in England, the study makes an original contribution to our wider understanding of the effect of economic shocks on housing. The inclusion of emerging effects on housing insecurity associated with the ongoing welfare reforms makes this analysis particularly relevant. The use of longitudinal data covering a broad timeline enables a rigorous and robust investigation of housing insecurity before, during, and after significant economic shocks. The international nature of the Global Financial Crisis provides opportunities for international comparison and means these findings may be valuable for other countries with similar economic or housing markets, or where similar economic shock response policies were employed.

The findings evidence the strong and persistent damaging effect of the Global Financial Crisis on experiences of housing payment problems. The slow recovery from this economic hit has been interrupted and slowed by further economic shocks in the form of the 2012 welfare reforms, though their effects have been less severe and persistent than those of the Global Financial Crisis. In both cases, post-economic shock impacts on housing insecurity have been experienced disproportionately by vulnerable populations. While some characteristics are consistently associated with increased risk of post-economic shock housing insecurity, others vary in how they interact with particular economic shocks. In particular, people with disabilities have experienced disproportionate levels of housing insecurity risk following more recent economic shocks. Renters, particularly those in the social rental sector, have similarly experienced increased likelihood of housing payment problems during the welfare reforms. These findings indicate the potential for economic shocks to further entrench the harmful post-GFC effects on the UK's housing landscape, and to interact with particular populations differently, aggregating existing housing inequalities or generating new ones.

The variation in how economic shocks interact with and make vulnerable particular populations or places highlights the need for flexibility in how we research and support different people during times of economic change or crisis. While the populations identified as vulnerable in this study may provide useful starting points for research into the effects of current and future economic shocks on housing insecurity, we should continue to expect heterogeneity in the vulnerability of places and populations in different economic contexts. We therefore recommend case-by-case research into how current and future economic

shocks interact with and affect housing insecurity. Moreover, the variation in how populations are impacted by economic shocks must be reflected in a flexible welfare system. The rigid nature of the current welfare system in England means that this need for flexibility is unmet, enabling unequal spatial and demographic impacts on housing insecurity and decreasing the capacity of vulnerable groups to absorb and recover from economic shocks.

Chapter 5 Conclusion

5.1 Review of aims

In this thesis I set out to investigate the unequal effects of policy changes and wider economic shifts on housing insecurity in England in the 21st century, examining the resilience and equality of the current housing and welfare systems. Within this research scope, I aimed to identify demographic and spatial characteristics that make people and places more vulnerable to increased housing insecurity risk in times of policy or economic change. In doing so, the thesis aimed to contribute to the wider body of research on welfare reform and housing outcomes by shedding light on current and developing populations and places that are at disproportionate risk of experiencing housing payment problems, and how policy and economic shocks can contribute to this risk. I also aimed to make methodological contributions to the research of housing insecurity and policy change by employing a research design that effectively reflects the practicalities of current housing policy and its wider economic context, particularly by integrating the complex rollout of Universal Credit.

Each chapter of the thesis contributed to the overall research goal by focusing on specific aims. Chapter 2 investigated the effect of the new Universal Credit system on housing insecurity for claimants living in rented housing in England, and the extent to which this effect differed to the experiences of claimants of the legacy Housing Benefit or Jobseeker's Allowance. Chapter 3 explored at what geographical level the variation in the effect of Universal Credit on housing insecurity takes place, and what area-level characteristics were associated with larger changes in housing insecurity following the introduction of Universal Credit. Finally Chapter 4 situated the changes in housing insecurity within a wider timeline, investigating how persistent the effects of the Global Financial Crisis were on housing payment problems in England, comparing the post-economic shock housing insecurity trajectory of the 2012 welfare reforms to that of the Global Financial Crisis in England, and explored whether post-economic shock housing effects differ by individual characteristics.

5.2 Findings

The research results revealed several overall trends in housing insecurity in England from the beginning of the 21st century to the present day. The overarching timeline for working-age social and private renters and mortgaged homeowners was characterised by a large and persistent increase in the risk of housing insecurity following the 2008 Global Financial Crisis. The gradual recovery from this crisis has been inhibited by the 2012 welfare reforms, causing a spike in the trajectory of housing insecurity in England. Chapters 2 and 3 focused particularly on the spike in housing insecurity associated with the 2012 Conservative–Liberal Democrat coalition government welfare reforms, and found that the introduction of Universal Credit had a significant effect on increasing the likelihood of housing insecurity for the overall sample of social and private renters in comparison to the legacy benefits of Housing Benefit or Jobseeker's Allowance.

Within these overall trends, the research found significant variation in housing insecurity and its relationship with policy, place, demographic characteristics, and economic shocks. Not only did these relationships exert influence individually, but also frequently overlapped to create interactions of heightened housing insecurity. The effect of Universal Credit on housing insecurity was found to vary significantly across low-level geographies of MSOAs and LSOAs in comparison to the legacy benefit system. Vulnerability to this effect also varied according to demographic group. Previous groups that would have claimed specific legacy variables were associated with particularly size or variation of effect on housing insecurity when moving to the Universal Credit system, with previous Housing Benefit claimants at an especially high risk of Universal Credit-related housing insecurity and previous Child Tax Credit claimants living in different areas experiencing large low-level geographical variation in the effect of Universal Credit on housing insecurity. Place and population further interacted to form pockets of housing insecurity risk for specific populations living in certain regions. Previous Housing Benefit claimants living in London and previous Income Support claimants living in the North East of England were found to be at particular risk of experiencing housing insecurity following the move to Universal Credit. Individual and household characteristics were also disproportionately associated with the likelihood of experiencing Universal Credit-related housing payment problems, most prominently being on a low income or having a disability. Furthermore, these characteristics were found to weaken respondents' capacity to absorb economic shocks such as the 2012 welfare reforms, placing them at a heightened risk of housing insecurity during times of economic crisis or change.

When viewed together, these findings paint a broad picture of housing inequality taking place across multiple facets of respondents' lives. This inequality takes the form of different levels of capability to meet housing payments, putting households at risk of adverse housing outcomes and increased financial hardship, and varying levels of capacity to absorb economic shocks without associated hits to their housing security. The range of places and demographic groups with different exposure and vulnerability to changes in the housing landscape mean that England's population were found to be highly heterogeneous in their housing experiences and support needs. The highly centralised UK welfare system is at odds with this heterogeneity, applying a largely inflexible welfare structure to claimants across the spectrum. The misalignment between the current centralised nature of this system (particularly in the form of Universal Credit) and the spatial and demographic heterogeneity of the populations and places to which it is applied negatively impacts particular population groups more than others, placing these claimants at disproportionate risk of experiencing financial hardship and housing insecurity. There is also potential for economic shocks to further entrench this inequality, interacting with particular populations differently to aggregate existing housing inequalities or generate new ones.

These findings shed light on the effects of Universal Credit and related recent policy changes and economic shocks. The systematic changes explored in this thesis are substantial and extensive, affecting a significant proportion of the population and making their relationship with increased risk of housing insecurity particularly important and urgent. In the case of Universal Credit, this systematic change is ongoing. The next stage of the welfare reform programme is 'Managed Migration', projected to take place between 2023 and 2029 (DWP, 2023), through which existing legacy benefit claimants without a change in circumstances will be moved to the Universal Credit system. As the Universal Credit system's reach widens and its outcomes become increasingly entrenched in the lives of claimants, the effects evidenced in this thesis will likely impact more people, particularly those belonging to populations identified here as vulnerable, including people on low incomes or with disabilities. Furthermore, these vulnerabilities will continue to interact with the after-effects of recent economic shocks and the continued recovery following the Global Financial Crisis. As well as potentially wide-reaching impacts in the UK, the findings have international relevance: as the ideological foundations of the current UK housing and welfare policies have been associated with a wider shift in welfare policy and thought within broader European and international contexts (Koch & Reeves, 2021; Gringrich & King, 2019), these results are likely to be relevant to similar systematic change taking place in other countries.

5.3 Recommendations

5.3.1 Policy recommendations

As the Universal Credit system's reach widens and its outcomes become increasingly entrenched in the lives of claimants, these vulnerable claimants in the Universal Credit system or waiting to be transferred as part of 'Managed Migration' will potentially encounter increased and compounding housing difficulties. 2.5 million households who are currently claiming legacy benefits are forecast to move to the Universal Credit system by 2030 (DWP, 2023). In order to effectively target policy and practice change, it is therefore crucial that future research into the effects of Universal Credit recognise and investigate its unequal impacts, building a stronger understanding of the populations and places most at risk of detrimental effects. Populations and places also vary in how they interact with economic shocks, with some groups potentially experiencing heightened vulnerability to housing insecurity during times of economic crisis or change. This heterogeneity in vulnerability must therefore be reflected in a flexible welfare system, capable of adapting to the differing needs of places and populations in particular economic contexts.

Based on these findings, I recommend several policy changes to increase the flexibility of the current welfare system, better respond to the heterogeneity of support needs, and avoid placing vulnerable populations at disproportionate risk of housing insecurity. In response to Chapters 2 and 3 which demonstrated the unequal housing effects of Universal Credit for different populations and places, policy change is therefore recommended to ensure members of more vulnerable groups or places are not disproportionately affected by the Universal Credit system, supporting similar recommendations put forward by previous Universal Credit studies (Cheetham, Moffatt & Addison, 2018, p38; Stacey, 2020, p8). Potential protective measures include reinstating removed or reduced disability-related premiums (Brewer, Joyce, Waters & Woods, 2019; Stacey, 2020), making the payment of housing costs more flexible and aligned with claimants' budgeting behaviours (Hartfree, 2014; Hickman, 2021), removing the required 5 week wait for payment (Reeves & Loopstra, 2020; Stacey, 2020), and ring-fencing the housing element of Universal Credit so that sanctioning cannot be applied to essential housing costs (Reeves & Loopstra, 2020). In response to Chapter 4, I echo these recommendations and put further recommendations for times of economic shock. In order to facilitate economic recovery and ease housing insecurity in the wake of recent economic shocks, particularly through the sustained impacts of the Global Financial Crisis, I recommend that housing practitioners and policymakers

provide particular support for renters, unemployed people, and people with disabilities, as they are especially vulnerable to post-economic shock housing insecurity.

5.3.2 Methodological recommendations

The research also makes methodological contributions by employing a research design that effectively reflects the practicalities of current housing policy and its wider economic context. Previous studies into the effects of Universal Credit have been limited by a reliance on pilot programmes of older versions of the policy (Hickman, Kemp, Reeve & Wilson, 2017), cross-sectional data (Hardie, 2020), or simplified operationalisations of the rollout based on characteristics such as place (Hardie, 2020; D'Este & Harvey, 2020) or employment status (Wickham et al, 2020). By contrast, this thesis has more closely reflected how Universal Credit has been implemented in practice by employing a fixed effects approach and wave-by-wave analysis of new Universal Credit and legacy benefit claimants (Chapter 2), and by adding a multilevel structure to incorporate spatial differences (Chapter 3). This methodological approach reduces the impact of individual selection effects that vary by place and time in the rollout, producing a more accurate comparison of similar claimants in similar circumstances.

When taking into account Universal Credit's varied rollout in this way, the effects of Universal Credit are frequently smaller than when taking a more general approach. Studies that do not sufficiently integrate the way in which Universal Credit's rollout has changed over time may therefore generate exaggerated accounts of its effects. As a result, they miss the more specific effects Universal Credit has for particular population groups (such as people with disabilities), making it harder to focus support or reform where it will be most effective. These findings therefore show the importance of incorporating the varied practical implementation of Universal Credit into comparison group construction and research design. Similarly, Chapter 3 of this thesis has demonstrated the importance of spatial variation in policy effects, and the need to account for it in modelling approaches (such as the use of a multilevel research design). The recommendation of incorporating spatial and policy elements in research design to increase robustness and accuracy is widely applicable, and would be a valuable consideration across disciplines, policies and methods.

5.3.3 Future research topics

Based on the findings of this thesis, I recommend several potential avenues for future research. The findings identify several populations and places that are particularly vulnerable

to housing insecurity related to Universal Credit and other economic shocks. Further research into these populations and places and the mechanisms behind their vulnerability is recommended. In particular, people with disabilities or long term health conditions were frequently found to be especially vulnerable to housing insecurity across all studies comprising this thesis, making them an urgent focus for future research. Furthermore, emerging vulnerable groups following the COVID-19 pandemic and future economic shocks require context-specific research as data becomes available. There are also opportunities to approach the thesis and its findings from different perspectives. The current research employs a conceptualisation of housing insecurity based on affordability and housing payment problems. However, diverse conceptualisations of housing insecurity are used across housing research (Rhodes and Rugg, 2018, p46; Foye, 2020, p5; Clair, Reeves, McKee & Stuckler, 2019; Routhier, 2019, p236). Carrying out a complementary study using an alternative measure of housing insecurity that is outside the scope of the current study, such as risk of eviction, may provide insights into how the effects explored here materialise for different housing outcomes and relate to my findings on affordability.

Due to the rollout of Universal Credit up to the present time affecting only claimants making new or changed claims, the research in Chapters 2 and 3 focuses on respondents in these circumstances. As the Managed Migration programme is implemented in the coming months and years, current legacy benefit claimants whose claims have not changed will move to the Universal Credit system. Repeating the studies to include this group of claimants would enable researchers to compare the experiences of earlier Universal Credit claimants with those transferred through Managed Migration, who may have different support needs and higher levels of vulnerability, and consequently experience larger increases in their likelihood of housing insecurity. England's housing landscape has similarities to those of some other countries in terms of response to the Global Financial Crisis and the shift to a narrower, more conditional welfare system, providing an opportunity for comparative international research to identify whether the effects and vulnerable groups identified occur in other national contexts.

6 References

Adler, M. (2018). *Cruel, inhuman or degrading treatment? Benefit sanctions in the UK.* London: Palgrave Macmillan.

Angrist, J. & Pischke, J. (2009). *Mostly harmless econometrics: an empiricist's companion.* Princeton: Princeton University Press.

Baker, E., Bentley, R., Lester, L., & Beer, A. (2016). Housing affordability and residential mobility as drivers of locational inequality. *Applied Geography, 72*, 65–75. https://doi.org/10.1016/j.apgeog.2016.05.007

Beatty, C., Cole, I., Foden, M., & Powell, R. (2014). *The impact of recent reforms to Local Housing Allowances: Differences by place.* Research Report No 873, Centre for Regional Economic and Social Research & Department for Work and Pensions.

Beatty, C. & Fothergill, S. (2013). *Hitting the poorest places hardest: The local and regional impact of welfare reform.* Sheffield: Centre for Regional Economic and Social Research.

Bhattarai, S., Schwartzman, F., & Yang, C. (2021). Local scars of the US housing crisis. *Journal of Monetary Economics, 119*, 40–57. https://doi.org/10.1016/j.jmoneco.2021.02.001

Blaseio, B., & Jones, C. (2019). Regional economic divergence and house prices: a comparison of Germany and the UK. *International Journal of Housing Markets and Analysis, 12(4)*, 722–735. https://doi.org/10.1108/IJHMA-08-2018-0055

Bramley, G. & Fitzpatrick, S. (2018). Homelessness in the UK: who is most at risk? *Housing Studies, 33:1,* pp. 96-116.

Brewer, M., Joyce, R., Waters, T., & Woods, J. (2019). *Universal credit and its impact on household incomes: the long and the short of it. IFS Briefing Note BN248.* IFS. Available at https://www.ifs.org.uk/uploads/publications/bns/Universal_credit_and_its_impact_on_household_incomes_the_long_and_the_short_of_it_BN248.pdf, accessed 03/12/2020.

Burgard, S. A., Seefeldt, K. S., & Zelner, S. (2012). Housing instability and health: Findings from the Michigan recession and recovery study. *Social Science and Medicine, 75,* pp. 2215–2224.

Buscha, F., Gorman, E. and Sturgis, P. (2021) ‘Spatial and social mobility in England and Wales: A sub‐national analysis of differences and trends over time’, *The British Journal of Sociology*, 72(5), pp. 1378–1393. doi:10.1111/1468-4446.12885.

Cabrera-Álvarez, P., James, N., and Lynn, P. (2023). *Panel attrition in the General Population Sample and the Immigrant and Ethnic Minority Boost of Understanding Society*. Understanding Society Working Paper Series, No. 2023-03. Available at: www.understandingsociety.ac.uk/sites/default/files/downloads/working-papers/2023-03.pdf

Centre for Local Economic Strategies (CLES). (2014). *A summary of austerity in London and a case study of Islington Council.* Manchester: Centre for Local Economic Strategies.

Centre for Cities. (2023). *City factsheet: Birkenhead.* Available at: https://www.centreforcities.org/city/birkenhead

Centre for Enterprise (CFE). (2022). *Evaluation of Understanding Society: Impact and views of data users.* Available at https://www.ukri.org/wp-content/uploads/2022/09/ESRC-120922-MainReportAndCaseStudies.pdf

Chamberlain, C., & Johnson, G. (2013). Pathways into adult homelessness. *Journal of Sociology, 49(1),* pp. 60–77.

Cheetham, M., Moffatt, S. & Addison, M. (2018). *“It’s hitting people that can least afford it the hardest” the impact of the roll out of Universal Credit in two North East England localities: a qualitative study.* Gateshead: Gateshead Council. Available at: https://www.gateshead.gov.uk/media/10665/The-impact-of-the-roll-out-of-Universal-Credit-in-two-North-East-England-localities-a-qualitative-study-November-2018/pdf/Universal_Credit_Report_2018pdf.pdf?m=636778831081630000

Cheshire West and Chester Council. (2022). *State of the Borough.* Available at: https://www.cheshirewestandchester.gov.uk/your-council/key-statistics-and-data/state-of-the-borough/inequality-and-deprivation

Citizens Advice (2022). *Moving from DLA to PIP.* https://www.citizensadvice.org.uk/benefits/sick-or-disabled-people-and-carers/pip/before-claiming/if-you-get-dla/

Clair, A., Reeves, A., McKee, M. & Stuckler, D. (2019). Constructing a housing precariousness measure for Europe. *Journal of European Social Policy, 29(1),* pp. 13–28.

Cobb-Clark, D., Herault, N., Scutella, R. and Tseng, Y. (2016). A journey home: What drives how long people are homeless? *Journal of Urban Economics*, 91, p.57–72.

Connolly, J., Pyper, R. and van der Zwet, A. (2021) ‘Governing 'levelling-up' in the UK: challenges and prospects’, *Contemporary Social Science*, 16(5), pp. 523–537. doi:10.1080/21582041.2021.1957495.

Coyle, D. & Sensier, M. (2020). The imperial treasury: appraisal methodology and regional economic performance in the UK. *Regional Studies, 54:3*, 283-295, DOI: 10.1080/00343404.2019.1606419

Davies, R. (2016). ‘How the town of Corby dusted off the ashes of post-industrial decay.’ *The Guardian,* 27 May. Available at: https://www.theguardian.com/uk-news/2016/may/27/corby-northamptonshire-twin-shijiazhuang-china-fastest-growing

Dean, N., Dong, G., Piekut, A., & Pryce, G.. (2019). Frontiers in Residential Segregation: Understanding Neighbourhood Boundaries and Their Impacts. *Tijdschrift Voor Economische En Sociale Geografie/Royal Dutch Geographical Society, 110(3)*, 271–288. https://doi.org/10.1111/tesg.12316

Department for Levelling Up, Housing and Communities (DLUHC). (2021). *Levelling Up the United Kingdom (CP 604)*. London: HMSO.

Department for Work and Pensions (DWP). (2010). *Statistical release: November 2010*. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/222745/stats_summary_nov2010.pdf

Department for Work and Pensions (DWP). (2014). *Evaluating the Impact of Universal Credit on the Labour Market in Live Service and the North West Expansion.* London: DWP. www.gov.uk/government/publications/evaluating-the-impact-of-universal-credit-on-the-labour-market

Department for Work & Pensions (DWP). (2015). *2010 to 2015 government policy: welfare reform.* Available at: https://www.gov.uk/government/publications/2010-to-2015-government-policy-welfare-reform

Department for Work and Pensions (DWP). Foster, R., Adams, L., Svanaes, S., O’Driscoll, C. & Thomson, D. (2018). *Research Report 958, Universal Credit Full Service Survey, June 2018*. London: DWP. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714842/universal-credit-full-service-claimant-survey.pdf

Department for Work and Pensions (DWP). (2020a). *DWP benefits statistics: August 2020.* https://www.gov.uk/government/statistics/dwp-benefits-statistics-august-2020/dwp-benefits-statistics-august-2020

Department for Work and Pensions (DWP). (2020b). *People on Universal Credit* [Data set]. https://stat-xplore.dwp.gov.uk/webapi/jsf/dataCatalogueExplorer.xhtml

Department for Work and Pensions (DWP). (2020c). *Guidance: Alternative Payment Arrangements.* https://www.gov.uk/government/publications/universal-credit-alternative-payment-arrangements/alternative-payment-arrangements

Department for Work and Pensions (DWP). (2021). Universal Credit statistics: background information and methodology. [Web page]. https://www.gov.uk/government/publications/universal-credit-statistics-background-information-and-methodology/universal-credit-statistics-background-information-and-methodology

Department for Work and Pensions (DWP). (2022a). *Housing Benefit* [Data set]. https://stat-xplore.dwp.gov.uk/webapi/jsf/dataCatalogueExplorer.xhtml

Department for Work and Pensions (DWP). (2022b). *Universal Credit statistics, 29 April 2013 to 13 January 2022*. https://www.gov.uk/government/statistics/universal-credit-statistics-29-april-2013-to-13-january-2022

Department for Work and Pensions (DWP). (2022c). *Completing the move to Universal Credit.* https://www.gov.uk/government/publications/completing-the-move-to-universal-credit

Department for Work and Pensions (DWP). (2023). Universal Credit statistics: background information and methodology. [Web page]. https://www.gov.uk/government/publications/completing-the-move-to-universal-credit-learning-from-the-discovery-phase/completing-the-move-to-universal-credit-learning-from-the-discovery-phase

D'Este, R. & Harvey, A. (2020). Universal Credit and Crime. *IZA Discussion Paper Series, IZA DP No. 13484.*

Dolton, P.; Rosazza-Bondibene, C.; Wadsworth, J. (2010). Employment, inequality and the UK national minimum wage over the medium-term. *IZA Discussion Papers, No. 5278*. Bonn: Institute for the Study of Labor (IZA).

Donald, B., Glasmeier, A., Gray, M., & Lobao, L. (2014). Austerity in the city: economic crisis and urban service decline? *Cambridge Journal of Regions, Economy and Society, 7(1)*, 3–15. https://doi.org/10.1093/cjres/rst040

Dwyer, P. (2018). Punitive and ineffective: benefit sanctions within social security. *Journal of Social Security Law*, pp. 142-157.

Dwyer, P. & Wright, S. (2014). Universal Credit, ubiquitous conditionality and its implications for social citizenship. *Journal of Poverty and Social Justice*, *22(1)*, pp. 27–35.

East Sussex County Council. (2022). *State of the County 2022: Focus on East Sussex*. Available at https://democracy.eastsussex.gov.uk/documents/s44287/Additional%20documents%20-%20Cabinet%20report%20Appendix%208%20-%20RPPR.pdf

Fallon, K. & Price, C. (2020). Meeting the needs of low-income housing for senior and disabled populations: an analysis of low-income housing tax credit residents in Ohio. *Housing and Society, 47(3)*, pp. 244-268, DOI: 10.1080/08882746.2020.1783940

Fetzer, T., Sen, S. & Souza, P. (2019). *Housing insecurity, homelessness and populism: Evidence from the UK*. Warwick: University of Warwick.

Fitzpatrick, S., Bramley, G., & Johnsen, S. (2013). Pathways into Multiple Exclusion Homelessness in Seven UK Cities. *Urban Studies, 50(1),* pp. 148–168.

Fitzpatrick, S., Mackie, P., & Wood, J. (2019). *Homelessness prevention in the UK*. Glasgow: UK Collaborative Centre for Housing Evidence.

Foye, C. (2020). Ethically-speaking, what is the most reasonable way of evaluating housing outcomes? *Housing, Theory, and Society*, pp. 1–17.

Gingrich, J. & King, D. Americanising Brexit Britain's Welfare State? *The Political Quarterly, 90(1)*, pp. 89-98.

Glynn, C. & Fox, E. (2019). Dynamics of homelessness in urban America. *The Annals of Applied Statistics*, 13(1), p.573–605.

Gray, M., & Barford, A. (2018). The depths of the cuts: the uneven geography of local government austerity. *Cambridge Journal of Regions, Economy and Society, 11(3)*, 541–563. https://doi.org/10.1093/cjres/rsy019

Government Statistical Service (GSS). (2019). *Harmonisation of Definitions of Homelessness for UK Official Statistics: A Feasibility Report.* London: GSS.

Hamnett, C. (2009). Spatial Divisions of Welfare: The Geography of Welfare Benefit Expenditure and of Housing Benefit in Britain. *Regional Studies, 43:8*, 1015-1033, DOI: 10.1080/00343400802093813

Hamnett, C. (2011). The reshaping of the British welfare system and its implications for geography and geographers. *Progress in Human Geography, 35(2)*, 147–152. https://doi.org/10.1177/0309132510394121

Hamnett, C. (2014). Shrinking the welfare state: the structure, geography and impact of British government benefit cuts. *Transactions - Institute of British Geographers, 39(4)*, 490–503. https://doi.org/10.1111/tran.12049

Hardie, I., 2020. The Impact of Universal Credit Rollout on Housing Security: An Analysis of Landlord Repossession Rates in English Local Authorities. *Journal of Social Policy*, pp. 1–22.

Hartfree, Y. (2014). Universal credit: The impact of monthly payments on low income households. *The Journal of Poverty and Social Justice: Research, Policy, Practice, 22(1)*, pp. 15–26. https://doi.org/10.1332/175982714X13875307250087

Hastings, A., Bailey, N., Bramley, G., & Gannon, M. (2017). Austerity urbanism in England: The 'regressive redistribution' of local government services and the impact on the poor and marginalised. *Environment and Planning. A, 49(9)*, 2007–2024. https://doi.org/10.1177/0308518X17714797

HC Deb (House of Commons Debate), 16/12/2015, UIN 20446. Available at: https://questions-statements.parliament.uk/written-questions/detail/2015-12-16/20446#, accessed 01/04/2021.

Hick, R., Pomati, M. & Stephens, M. (2022). *Housing and poverty in Europe: Examining the interconnections in the face of rising house prices.* Cardiff, Cardiff University.

Hickman, P. (2021). Understanding social housing tenants' rent payment behaviour: evidence from Great Britain. *Housing Studies, 36:2,* pp. 235-257.

Hickman, P., Kemp, P., Reeve, K. & Wilson, I. (2017). The impact of the direct payment of housing benefit: evidence from Great Britain. *Housing Studies, 32(8)*, pp. 1105–1126.

Hobson, F. (2022). *The aims of ten years of welfare reform (2010-2020): research briefing.* House of Commons Library.

Hossain, M. (2021). Economic Scar Tissue of COVID-19 Puzzle: An Analysis, Evidence and Suggestion on Global Perspective. *Global Business Review, 97215092110559*. https://doi.org/10.1177/09721509211055960

Johnson, G., Scutella, R., Tseng, Y. & Wood, G. (2019). How do housing and labour markets affect individual homelessness? *Housing Studies, 34:7*, p.1089-1116.

Jones, K., Johnston, R., Manley, D., Owen, D., & Charlton, C. (2015). Ethnic Residential Segregation: A Multilevel, Multigroup, Multiscale Approach Exemplified by London in 2011. *Demography, 52(6)*, p. 1995–2019. doi:10.1007/s13524-015-0430-1.

Joseph Rowntree Foundation. (2020). UK Poverty 2019/20: the leading independent report. York: Joseph Rowntree Foundation.

Institute for Employment Studies (IES). (2010). *Understanding worklessness in Newham: Final Report*. Available at: https://www.newham.gov.uk/downloads/file/552/research-worklessness

International Monetary Fund (IMF), 2020. G-20 Background Note on Minimizing Scarring from the Pandemic. Available at: https://www.imf.org/-/media/Files/Research/imf-and-g20/2022/G20-minimizing-scarring-from-the-pandemic.ashx

Irons, J. (2009). Economic scarring: the long-term impacts of the recession. EPI Briefing Paper No. 243. Available at: https://www.epi.org/publication/bp243/

Jones, C. & Richardson, H. (2014). Housing markets and policy in the UK and the USA: A review of the differential impact of the global housing crisis. *International Journal of Housing Markets and Analysis, 7(1),* 129–144. https://doi.org/10.1108/IJHMA-10-2012-0052

Khan, A., Khan, N., & Shafiq, M. (2021). The economic impact of COVID-19 from a global perspective. *Contemporary Economics, 15(1)*, 64–76. https://doi.org/10.5709/ce.1897-9254.436

Kemp, P. (2014) *Direct Payment Demonstration Projects: The longitudinal survey of tenants, Research Report No. 889.* (London: Department for Work and Pensions).

Kemp, P. (2015). Private Renting After the Global Financial Crisis. *Housing Studies*, *30*(4), 601–620. https://doi.org/10.1080/02673037.2015.1027671

Kennett, P., Forrest, R. & Marsh, A. (2013). The Global Economic Crisis and the Reshaping of Housing Opportunities. *Housing, Theory, and Society, 30(1),* 10–28. https://doi.org/10.1080/14036096.2012.683292

Koch, I., & Reeves, A.. (2021). From social security to state-sanctioned insecurity: How welfare reform mimics the commodification of labour through greater state intervention. *Economy and Society,* pp. 1–23.

Liddle, J., Shutt, J. and Addidle, G. (2022) 'Editorial: Levelling up the United Kingdom? A useful mantra but too little substance or delivery?', *Local Economy*, 37(1-2), pp. 3–12. doi:10.1177/02690942221099835.

Loopstra, R., Fledderjohann, J., Reeves, A., & Stuckler, D. (2018). Impact of Welfare Benefit Sanctioning on Food Insecurity: a Dynamic Cross-Area Study of Food Bank Usage in the UK. *Journal of Social Policy, 47(3),* pp. 437–457.

Manley, D., Johnston, R., Jones, K. & Owen, D. (2015). Macro-, Meso- and Microscale Segregation: Modeling Changing Ethnic Residential Patterns in Auckland, New Zealand, 2001–2013. *Annals of the Association of American Geographers, 105(5)*, p. 951–967.

Martin Fuentes, N. and Moder, I. (2020). The scarring effects of past crises on the global economy. *Economic Bulletin Issue 8*, ECB. Available at: https://www.ecb.europa.eu/pub/economic-bulletin/focus/2021/html/ecb.ebbox202008_01~e038be4510.en.html

McCann, P. (2020). Perceptions of regional inequality and the geography of discontent: insights from the UK. *Regional Studies, 54:2,* 256-267, DOI: 10.1080/00343404.2019.1619928

McKee, K., Muir, J. & Moore, T. (2017). Housing policy in the UK: the importance of spatial nuance. *Housing Studies, 32 (1),* 60-72. https://doi.org/10.1080/02673037.2016.1181722.

Ministry of Housing, Communities & Local Government (MHCLG). (2019). *English indices of deprivation 2019, File 2: domains of deprivation.* https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

Ministry of Housing, Communities and Local Government (MHCLG). (2020). *English Housing Survey: Private rented sector, 2019-20.* Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1000052/EHS_19-20_PRS_report.pdf

Mulheirn, I. (2019). *Tackling the UK housing crisis: is supply the answer?* Glasgow: UK Collaborative Centre for Housing Evidence.

Muscat, R. (2010). *Area Based Initiatives – do they deliver?* CLES: Manchester. www.cles.org.uk/wp-content/uploads/2011/01/Area-Based-Initiatives-do-they-deliver.pdf

National Audit Office (NAO). (2016). *Benefit sanctions.* (HC 628, 2016-17). London: The Stationery Office.

O'Flaherty, B. (2004). Wrong person and wrong place: for homelessness, the conjunction is what matters. *Journal of Housing Economics, 13(1)*, pp. 1-15.

O'Leary, C., O'Shea, S. & Albertson, K. (2018). *Homelessness and the Private Rented Sector.* Manchester: Policy Evaluation and Research Unit, MMU. Available at: https://mmuperu.co.uk/wp-content/uploads/2020/09/MMU_Homelessness_and_the_private_rented_sector.pdf

Office for National Statistics (ONS). (2019). *Local Authority District to Region (April 2019) Lookup in England* [Data set]. https://geoportal.statistics.gov.uk/datasets/3ba3daf9278f47daba0f561889c3521a_0

Office for National Statistics (ONS). (2020). *House price to workplace-based earnings ratio* [Data set]. https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/ratioofhousepricetoworkplacebasedearningslowerquartileandmedian

Office for National Statistics (ONS). (2021). Unemployment rate (aged 16 and over, seasonally adjusted) [Data set]. https://www.ons.gov.uk/employmentandlabourmarket/peoplenotinwork/unemployment/timeseries/mgsx/lms

Office for National Statistics (ONS). (2023a). *Labour Market Profile: Bassetlaw.* Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157163/report.aspx

Office for National Statistics (ONS). (2023b). *Labour Market Profile: Barrow-in-Furness.* Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157076/printable.aspx

Office for National Statistics (ONS). (2023c). *Labour Market Profile: Canterbury.* Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157312/report.aspx

Office for National Statistics (ONS). (2023d). *Changes in private rental sector behaviour, England: February 2022 to February 2023.* Available at https://www.ons.gov.uk/peoplepopulationandcommunity/housing/articles/changesinprivaterentalsectorbehaviourengland/february2022tofebruary2023

Pearce, J. & Vine, J. (2014). Quantifying residualisation: the changing nature of social housing in the UK. *Journal of Housing and the Built Environment 29,* 657–675. https://doi.org/10.1007/s10901-013-9372-3

Pennington, J. & Rich, H. (2020). Homeless and Forgotten: Surviving lockdown in temporary accommodation. London: Shelter. Available at: https://england.shelter.org.uk/professional_resources/policy_and_research/policy_library/report_homeless_and_forgotten_surviving_lockdown_in_temporary_accommodation

Pollack, C. E., Griffin, B. A., & Lynch, J. (2010). Housing affordability and health among homeowners and renters. *American Journal of Preventive Medicine, 39(6)*, pp. 515–521.

Prentice, D. & Scutella, R. (2019). What are the impacts of living in social housing? New evidence from Australia. *Housing Studies, 35(4)*, pp. 1–25.

Preece, J., Hickman, P. & Pattison, B. (2019). The affordability of “affordable” housing in England: conditionality and exclusion in a context of welfare reform. *Housing Studies*, 35(7), pp. 1–25.

Preece, J., Robinson, D., Gibb, K., & Young, G. (2021). *Housing policy and poor-quality homes.* London: Centre for Ageing Better.

Reed, J. (2019). *Universal Credit and Housing Insecurity in England.* M.A. Dissertation, University of Sheffield.

Reeves, A. & Loopstra, R. (2017). ‘Set up to Fail’? How Welfare Conditionality Undermines Citizenship for Vulnerable Groups. *Social Policy and Society: a Journal of the Social Policy Association*, 16(2), pp. 327–338.

Reeves, A., & Loopstra, R. (2020). The Continuing Effects of Welfare Reform on Food Bank use in the UK: The Roll-out of Universal Credit. *Journal of Social Policy, 1–21.* https://doi.org/10.1017/S0047279420000513

Rhodes, D. & Rugg, J. (2018). *Vulnerability amongst Low-Income Households in the Private Rented Sector in England*. York: Centre for Housing Policy.

Rice, P. & Venables, A. (2021). The persistent consequences of adverse shocks: how the 1970s shaped UK regional inequality. *Oxford Review of Economic Policy, 37:1,* 132–151.

Robbins, G. (2022). New York's housing justice movement: facing the COVID eviction cliff edge. *City, 26(4),* 610–629. https://doi.org/10.1080/13604813.2022.2079878

Roberts, J. & Taylor, K. (2019). New Evidence on Disability Benefit Claims in the UK: The Role of Health and the Local Labour Market. *IZA Discussion Paper Series, No. 12825.* Bonn: Institute for the Study of Labor (IZA).

Routhier, G. (2019). Beyond Worst Case Needs: Measuring the Breadth and Severity of Housing Insecurity Among Urban Renters. *Housing Policy Debate, 29:2*, pp.235-249.

Scanlon, K. & Elsinga, M. (2014). Policy changes affecting housing and mortgage markets: how governments in the UK and the Netherlands responded to the GFC. *Journal of Housing and the Built Environment, 29(2),* 335–360. https://doi.org/10.1007/s10901-013-9390-1

Scottish Government. Policy: Social Security: Universal Credit (Scottish choices) [online]. [Viewed 27/04/2022]. Available from: https://www.gov.scot/policies/social-security/universal-credit/

Scottish Government. (2021). *Evaluation of Universal Credit Scottish choices.* Available from: https://www.gov.scot/publications/evaluation-universal-credit-scottish-choices/documents/, accessed 27/04/2022.

Stacey, B. (2020). *Blunt, bureaucratic and broken: how Universal Credit is failing people in vulnerable situations.* London: Z2K. Available at https://www.z2k.org/wp-content/uploads/2020/12/Blunt-bureaucratic-and-broken-double-page.pdf

Understanding Society. COVID-19 [online]. *Understanding Society.* [Viewed 14 June 2021]. Available at https://www.understandingsociety.ac.uk/topic/covid-19

Understanding Society. Main survey [online]. *Understanding Society*. [Viewed 4 October 2023]. Available at https://www.understandingsociety.ac.uk/documentation/mainstage

Understanding Society. Response rates [online]. *Understanding Society*. [Viewed 4 October 2023]. Available at https://www.understandingsociety.ac.uk/documentation/mainstage/user-guides/main-survey-user-guide/response-rates

Understanding Society. Study design [online]. *Understanding Society*. [Viewed 4 October 2023]. Available at https://www.understandingsociety.ac.uk/documentation/mainstage/user-guides/main-survey-user-guide/study-design

Understanding Society. Survey timeline [online]. *Understanding Society*. [Viewed 4 October 2023]. Available at https://www.understandingsociety.ac.uk/documentation/mainstage/survey-timeline

United Kingdom Government (UK Govt.) (2023). *Universal Credit*. https://www.gov.uk/universal-credit

University of Essex, Institute for Social and Economic Research. (2020). *Understanding Society: Waves 1-10, 2009-2019 and Harmonised BHPS: Waves 1-18, 1991-2009: Special Licence Access, Census 2001 Lower Layer Super Output Areas*. [data collection]. *12th Edition.* UK Data Service. SN: 6670.

University of Essex, Institute for Social and Economic Research. (2022). *Understanding Society: Waves 1-12, 2009-2021 and Harmonised BHPS: Waves 1-18, 1991-2009. Special Licence Access, Census 2001 Lower Layer Super Output Areas*. [data collection]. 17th Edition. UK Data Service. SN: 6670, http://doi.org/10.5255/UKDA-SN-6614-18

Vilenica, A., McElroy, E., Ferreri, M., Fernández Arrigoitia, M., García-Lamarca, M. & Lancione, M. (2020.) Covid-19 and housing struggles: The (re)makings of austerity, disaster capitalism, and the no return to normal. *Radical Housing Journal*, *2(1)*, 9-28. Available at: https://radicalhousingjournal.org/2020/covid-19-and-housing-struggles

Webster, D. (2014). *Briefing: the DWP'S JSA/ESA sanctions statistics release, 13 August 2014.* London: CPAG. Available from https://cpag.org.uk/sites/default/files/uploads/CPAG-14-08-Sanctions-Stats-Briefing-D-Webster-Aug-2014.pdf

Webster, D. (2022). *Briefing: Benefit Sanctions Statistics, February 2022.* London: CPAG. Available from https://cpag.org.uk/policy-and-campaigns/briefing/david-webster-university-glasgow-briefings-benefit-sanctions, accessed 12/04/2022.

Whitehead, C., Markkanen, S., Monk, S., & Scanlon, K. (2012). *The private rented sector in the new century: A comparative approach.* Copenhagen: Realdania.

Whitehead, C. & Williams, P. (2011). Causes and Consequences? Exploring the Shape and Direction of the Housing System in the UK Post the Financial Crisis. *Housing Studies, 26(7-8)*, 1157–1169. https://doi.org/10.1080/02673037.2011.618974

Wickham, S., Rose, T., Whitehead, M., Taylor-Robinson, D. & Barr, B. (2020). *Effects on mental health of a UK welfare reform, Universal Credit: a longitudinal controlled study.* The Lancet Public Health, 5(3), p.157–164.

Wilson, I. (2019). Direct payment of Housing Benefit: responsibilisation at what cost to landlords? *International Journal of Housing Policy, 19:4,* pp. 566-587.

Worthing Evolution. (2006). *Worthing Evolution Town Centre And Seafront Masterplan*. Available at: https://www.adur-worthing.gov.uk/media/Media,83565,smxx.pdf

Zhang, M., & Pryce, G.. (2020). The dynamics of poverty, employment and access to amenities in polycentric cities: Measuring the decentralisation of poverty and its impacts in England and Wales. *Urban Studies, 57(10)*, 2015–2030. https://doi.org/10.1177/0042098019860776

R Packages

Bates, D., Mächler, M., Bolker, B., Walker, S. (2015). “Fitting Linear Mixed-Effects Models Using lme4.” *Journal of Statistical Software, 67(1)*, 1–48. doi:10.18637/jss.v067.i01.

Eddelbuettel, D. (2020). *anytime: Anything to POSIXct or Date Converter*. R package version 0.3.9. http://dirk.eddelbuettel.com/code/anytime.html.

Eddelbuettel, D., François, R. (2011). “Rcpp: Seamless R and C++ Integration.” *Journal of Statistical Software*, 40(8), 1–18. doi: 10.18637/jss.v040.i08, https://www.jstatsoft.org/v40/i08/.

Ho D., Imai K., King G, Stuart E. (2011). “MatchIt: Nonparametric Preprocessing for Parametric Causal Inference.” *Journal of Statistical Software*, *42(8)*, 1–28. https://www.jstatsoft.org/v42/i08/

Kuznetsova, A., Brockhoff, P., Christensen, R. (2017). “lmerTest Package: Tests in Linear Mixed Effects Models.” *Journal of Statistical Software, 82(13),* 1–26. doi:10.18637/jss.v082.i13.

Therneau, T. (2022). *A Package for Survival Analysis in R.* R package version 3.3-1. https://CRAN.R-project.org/package=survival.

R Core Team (2019). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Robinson, D. (2014). ‘broom: An R Package for Converting Statistical Analysis Objects Into Tidy Data Frames’. *arXiv: Computation*.

Sarkar, D. (2008). *Lattice: Multivariate Data Visualization with R*. Springer, New York. http://lmdvr.r-forge.r-project.org.

Wickham H (2011). “The Split-Apply-Combine Strategy for Data Analysis.” *Journal of Statistical Software*, 40(1), 1–29. http://www.jstatsoft.org/v40/i01/

Wickham H, Averick M, Bryan J, Chang W, McGowan LD, François R, Grolemund G, Hayes A, Henry L, Hester J, Kuhn M, Pedersen TL, Miller E, Bache SM, Müller K, Ooms J, Robinson D, Seidel DP, Spinu V, Takahashi K, Vaughan D, Wilke C, Woo K, Yutani H (2019). “Welcome to the tidyverse.” *Journal of Open Source Software*, 4(43), 1686. doi: 10.21105/joss.01686

7 Appendices

Chapter 2 Appendix 1 Regression table for fixed effects logistic regression models: new claimants.

	UC/HB group comparison model: new					UC/JSA group comparison model: new				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.59	0.09	0.00001	1.81	***	0.34	0.13	0.01	1.41	**
Benefit: JSA	-0.16	0.17	0.35	0.86		0.14	0.13	0.27	1.15	
Benefit: HB	0.03	0.05	0.47	1.03		-0.04	0.11	0.72	0.96	
Benefit income	-0.0001	0.00001	0.00003	1.00	***	-0.0002	0.0001	0.01	1.00	*
Age: 21-34	0.08	0.16	0.61	1.09		0.01	0.17	0.93	1.01	
Age: 25-34	0.31	0.19	0.11	1.36		0.15	0.24	0.53	1.16	
Age: 35-44	0.43	0.22	0.06	1.54		0.12	0.35	0.72	1.13	
Age: 45-54	0.60	0.26	0.02	1.82	*	0.12	0.44	0.79	1.13	
Age: 55-64	0.65	0.29	0.03	1.92	*	0.29	0.53	0.59	1.34	
Employed	0.21	0.05	0.0001	1.23	***	0.04	0.10	0.68	1.04	
Disability	0.20	0.05	0.0001	1.23	***	0.04	0.10	0.70	1.04	
Children in HH	-0.05	0.09	0.55	0.95		-0.17	0.18	0.35	0.85	
No. of children	0.03	0.03	0.35	1.03		0.16	0.07	0.02	1.17	*
Single in HH	-0.06	0.08	0.40	0.94		-0.22	0.15	0.14	0.80	
Private tenure	-0.10	0.07	0.17	0.90		-0.13	0.14	0.37	0.88	
Housing decile	0.03	0.10	0.74	1.04		-0.03	0.20	0.88	0.97	
Wave 2	-0.33	0.07	0.00001	0.72	***	-0.43	0.15	0.01	0.65	**
Wave 3	-0.22	0.07	0.002	0.80	**	-0.36	0.16	0.02	0.70	*
Wave 4	-0.22	0.08	0.004	0.80	**	-0.12	0.16	0.48	0.89	
Wave 5	-0.24	0.07	0.001	0.79	**	-0.19	0.16	0.23	0.82	
Wave 6	-0.07	0.08	0.38	0.93		0.05	0.16	0.78	1.05	

Wave 7	-0.44	0.08	0.00001	0.65	***	0.03	0.17	0.88	1.03	
Wave 8	-0.39	0.09	0.00001	0.68	***	0.08	0.18	0.65	1.09	
Wave 9	-0.41	0.09	0.00001	0.66	***	-0.13	0.19	0.49	0.88	
Wave 10	-0.40	0.10	0.0001	0.67	***	0.06	0.21	0.78	1.06	

Chapter 2 Appendix 2 Regression table for fixed effects logistic regression models: new claimants at Wave 6

	UC/HB group comparison model: W6					UC/JSA group comparison model: W6				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.54	0.10	0.00001	1.72	***	0.26	0.14	0.06	1.30	
Benefit: JSA	-0.19	0.18	0.29	0.83		0.15	0.14	0.31	1.16	
Benefit: HB	-0.001	0.05	0.99	1.00		-0.10	0.12	0.37	0.90	
Benefit income	-0.0002	0.00	0.0001	1.00	***	-0.0001	0.0001	0.06	1.00	
Age: 21-34	0.18	0.19	0.34	1.20		0.17	0.19	0.36	1.19	
Age: 25-34	0.37	0.22	0.09	1.45		0.32	0.26	0.21	1.38	
Age: 35-44	0.47	0.25	0.06	1.60		0.25	0.37	0.49	1.29	
Age: 45-54	0.67	0.28	0.02	1.95	*	0.21	0.46	0.66	1.23	
Age: 55-64	0.64	0.32	0.04	1.90	*	0.27	0.56	0.63	1.31	
Employed	0.19	0.06	0.001	1.21	***	-0.02	0.11	0.88	0.98	
Disability	0.18	0.06	0.002	1.20	**	0.04	0.11	0.72	1.04	
Children in HH	-0.03	0.10	0.73	0.97		-0.02	0.19	0.90	0.98	
No. of children	0.02	0.04	0.52	1.02		0.17	0.07	0.02	1.18	*
Single in HH	-0.05	0.08	0.57	0.96		-0.21	0.16	0.19	0.81	
Private tenure	-0.13	0.08	0.12	0.88		0.02	0.15	0.91	1.02	
Housing decile	0.01	0.11	0.91	1.01		-0.14	0.21	0.50	0.87	
Wave 2	-0.33	0.08	0.00003	0.72	***	-0.47	0.17	0.01	0.62	**
Wave 3	-0.25	0.08	0.002	0.78	**	-0.30	0.17	0.08	0.74	
Wave 4	-0.26	0.09	0.003	0.77	**	-0.18	0.18	0.32	0.84	
Wave 5	-0.20	0.08	0.02	0.82	*	-0.19	0.17	0.28	0.83	
Wave 6	-0.06	0.08	0.47	0.94		0.04	0.17	0.82	1.04	

Wave 7	-0.44	0.09	0.00001	0.65	***	-0.03	0.18	0.86	0.97	
Wave 8	-0.34	0.09	0.0002	0.71	***	0.14	0.19	0.45	1.15	
Wave 9	-0.40	0.10	0.0001	0.67	***	-0.12	0.21	0.56	0.89	
Wave 10	-0.39	0.11	0.0003	0.67	***	0.09	0.22	0.69	1.09	

Chapter 2 Appendix 3 Regression table for fixed effects logistic regression models: new claimants at Wave 7.

	UC/HB group comparison model: W7					UC/JSA group comparison model: W7				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	1.34	0.29	0.00001	3.82	***	1.05	0.38	0.01	2.86	***
Benefit: JSA	0.42	0.33	0.20	1.53		0.73	0.38	0.06	2.07	
Benefit: HB	0.58	0.27	0.03	1.78	*	0.54	0.36	0.13	1.72	
Benefit income	-0.0002	0.00001	0.00001	1.00	***	-0.0002	0.0001	0.01	1.00	*
Age: 21-34	-0.06	0.18	0.76	0.95		-0.09	0.19	0.64	0.91	
Age: 25-34	0.22	0.21	0.31	1.24		-0.01	0.26	0.97	0.99	
Age: 35-44	0.38	0.25	0.13	1.46		-0.02	0.37	0.96	0.98	
Age: 45-54	0.61	0.28	0.03	1.85	*	-0.02	0.46	0.96	0.98	
Age: 55-64	0.62	0.32	0.05	1.85	**	0.07	0.57	0.90	1.07	
Employed	0.20	0.06	0.001	1.22	***	0.03	0.11	0.77	1.03	
Disability	0.21	0.06	0.0003	1.23		-0.01	0.11	0.91	0.99	
Children in HH	-0.05	0.10	0.62	0.95		-0.05	0.20	0.78	0.95	
No. of children	0.04	0.04	0.28	1.04		0.15	0.08	0.05	1.16	*
Single in HH	-0.11	0.08	0.18	0.90		-0.13	0.16	0.42	0.88	
Private tenure	-0.11	0.08	0.20	0.90		0.03	0.16	0.85	1.03	
Housing decile	0.11	0.11	0.33	1.12		0.07	0.22	0.77	1.07	
Wave 2	-0.34	0.08	0.0001	0.71	***	-0.45	0.18	0.01	0.64	*
Wave 3	-0.25	0.08	0.002	0.78	**	-0.40	0.18	0.02	0.67	*
Wave 4	-0.27	0.09	0.002	0.76	**	-0.24	0.18	0.18	0.78	
Wave 5	-0.21	0.09	0.01	0.81	*	-0.22	0.18	0.22	0.80	
Wave 6	-0.01	0.09	0.92	0.99		0.10	0.18	0.56	1.11	

Wave 7	-0.46	0.09	0.00001	0.63	***	0.001	0.18	1.00	1.00	
Wave 8	-0.43	0.10	0.00001	0.65	***	0.06	0.19	0.75	1.06	
Wave 9	-0.44	0.10	0.00002	0.64	***	-0.10	0.21	0.63	0.90	
Wave 10	-0.51	0.11	0.00001	0.60	***	-0.06	0.23	0.79	0.94	

Chapter 2 Appendix 4 Regression table for fixed effects logistic regression models: new claimants at Wave 8.

	UC/HB group comparison model: W8					UC/JSA group comparison model: W8				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.46	0.22	0.03	1.59	*	0.32	0.28	0.25	1.38	
Benefit: JSA	-0.34	0.26	0.20	0.71		0.02	0.28	0.95	1.02	
Benefit: HB	-0.22	0.20	0.26	0.80		-0.14	0.25	0.58	0.87	
Benefit income	-0.0002	0.00001	0.00003	1.00	***	-0.0002	0.0001	0.01	1.00	*
Age: 21-34	0.07	0.19	0.73	1.07		0.09	0.20	0.66	1.09	
Age: 25-34	0.18	0.22	0.42	1.19		0.27	0.26	0.30	1.31	
Age: 35-44	0.34	0.25	0.18	1.41		0.27	0.37	0.46	1.31	
Age: 45-54	0.56	0.29	0.05	1.75		0.28	0.46	0.55	1.32	
Age: 55-64	0.57	0.33	0.08	1.77		0.50	0.56	0.37	1.65	
Employed	0.18	0.06	0.005	1.19	**	0.08	0.11	0.50	1.08	
Disability	0.20	0.06	0.001	1.22	***	0.06	0.11	0.60	1.06	
Children in HH	-0.07	0.10	0.50	0.93		-0.15	0.19	0.44	0.86	
No. of children	0.04	0.04	0.34	1.04		0.18	0.07	0.01	1.20	*
Single in HH	-0.18	0.09	0.03	0.83	*	-0.25	0.16	0.11	0.78	
Private tenure	-0.20	0.09	0.02	0.82	*	-0.13	0.16	0.42	0.88	
Housing decile	0.07	0.11	0.51	1.08		-0.16	0.22	0.47	0.85	
Wave 2	-0.34	0.09	0.0001	0.71	***	-0.51	0.18	0.004	0.60	**
Wave 3	-0.31	0.09	0.0005	0.74	***	-0.51	0.18	0.004	0.60	**
Wave 4	-0.21	0.09	0.02	0.81	*	-0.23	0.18	0.21	0.79	
Wave 5	-0.23	0.09	0.01	0.79	**	-0.27	0.18	0.13	0.76	
Wave 6	-0.09	0.09	0.34	0.92		-0.06	0.18	0.73	0.94	

Wave 7	-0.41	0.10	0.00002	0.66	***	-0.03	0.19	0.89	0.98	
Wave 8	-0.41	0.10	0.00002	0.66	***	-0.04	0.19	0.81	0.96	
Wave 9	-0.47	0.11	0.00001	0.63	***	-0.30	0.21	0.15	0.74	
Wave 10	-0.41	0.11	0.0003	0.66	***	-0.05	0.23	0.83	0.95	

Chapter 2 Appendix 5 Regression table for fixed effects logistic regression models: new claimants at Wave 9.

	UC/HB group comparison model: W9					UC/JSA group comparison model: W9				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.36	0.19	0.06	1.43		0.51	0.25	0.05	1.66	*
Benefit: JSA	-0.68	0.25	0.01	0.51	**	-0.07	0.24	0.76	0.93	
Benefit: HB	-0.37	0.16	0.02	0.69	*	-0.09	0.21	0.65	0.91	
Benefit income	-0.0002	0.00001	0.00001	1.00	***	-0.0003	0.0001	0.001	1.00	**
Age: 21-34	-0.03	0.21	0.87	0.97		-0.13	0.21	0.53	0.88	
Age: 25-34	0.15	0.24	0.53	1.16		-0.02	0.28	0.93	0.98	
Age: 35-44	0.27	0.27	0.33	1.30		-0.10	0.39	0.80	0.91	
Age: 45-54	0.41	0.31	0.19	1.50		-0.22	0.49	0.65	0.80	
Age: 55-64	0.36	0.35	0.30	1.44		0.01	0.59	0.98	1.01	
Employed	0.15	0.07	0.02	1.16	*	0.17	0.12	0.16	1.18	
Disability	0.21	0.06	0.001	1.23	***	-0.01	0.11	0.93	0.99	
Children in HH	-0.11	0.11	0.30	0.90		-0.24	0.20	0.22	0.79	
No. of children	0.06	0.04	0.12	1.06		0.26	0.08	0.001	1.30	**
Single in HH	-0.14	0.09	0.13	0.87		-0.24	0.17	0.17	0.79	
Private tenure	-0.11	0.09	0.25	0.90		-0.11	0.17	0.51	0.89	
Housing decile	-0.04	0.12	0.76	0.96		-0.27	0.24	0.27	0.77	
Wave 2	-0.42	0.09	0.00001	0.66	***	-0.45	0.19	0.02	0.64	*
Wave 3	-0.34	0.09	0.0003	0.71	***	-0.60	0.19	0.001	0.55	**
Wave 4	-0.23	0.10	0.02	0.80	*	-0.31	0.20	0.11	0.73	
Wave 5	-0.23	0.10	0.02	0.79	*	-0.28	0.19	0.13	0.75	
Wave 6	-0.09	0.10	0.35	0.91		0.04	0.19	0.84	1.04	

Wave 7	-0.35	0.10	0.0005	0.70	***	-0.02	0.19	0.91	0.98	
Wave 8	-0.34	0.10	0.001	0.71	**	0.08	0.20	0.70	1.08	
Wave 9	-0.42	0.11	0.0001	0.66	***	-0.26	0.21	0.23	0.77	
Wave 10	-0.41	0.12	0.0005	0.66	***	-0.12	0.24	0.61	0.89	

Chapter 2 Appendix 6 Regression table for whole sample logistic regression models without benefit income.

	UC/HB group comparison model					UC/JSA group comparison model				
Variable	Log odds	Std. error	p value	Odds ratio	Sig.	Log odds	Std. error	p value	Odds ratio	Sig.
UC treatment	0.56	0.10	0.00001	1.75	***	0.38	0.12	0.001	1.46	**
Benefit: JSA	-0.13	0.15	0.41	0.88		0.24	0.11	0.04	1.27	*
Benefit: HB	0.01	0.04	0.80	1.01		-0.06	0.10	0.53	0.94	
Age: 21-34	0.07	0.15	0.62	1.08		0.05	0.16	0.74	1.06	
Age: 25-34	0.26	0.18	0.15	1.29		0.27	0.22	0.22	1.30	
Age: 35-44	0.39	0.21	0.06	1.48		0.30	0.31	0.34	1.35	
Age: 45-54	0.51	0.24	0.03	1.67	*	0.33	0.40	0.41	1.39	
Age: 55-64	0.62	0.27	0.02	1.86	*	0.60	0.49	0.22	1.83	
Employed	0.23	0.05	0.00001	1.26	***	0.19	0.09	0.04	1.21	*
Disability	0.19	0.05	0.0001	1.21	***	0.07	0.09	0.46	1.07	
Children in HH	-0.06	0.09	0.48	0.94		0.05	0.16	0.77	1.05	
No. of children	-0.01	0.03	0.79	0.99		0.10	0.06	0.10	1.10	
Single in HH	-0.04	0.07	0.56	0.96		-0.20	0.13	0.13	0.82	
Private tenure	-0.11	0.07	0.10	0.90		-0.10	0.13	0.43	0.90	
Housing decile	-0.01	0.09	0.89	0.99		-0.05	0.18	0.80	0.95	
Wave 2	-0.29	0.06	0.00001	0.75	***	-0.40	0.13	0.002	0.67	**
Wave 3	-0.18	0.06	0.004	0.84	**	-0.41	0.14	0.003	0.66	**
Wave 4	-0.24	0.07	0.001	0.79	***	-0.19	0.15	0.19	0.83	
Wave 5	-0.24	0.07	0.0004	0.79	***	-0.34	0.14	0.02	0.71	*
Wave 6	-0.06	0.07	0.38	0.94		-0.14	0.15	0.35	0.87	
Wave 7	-0.49	0.08	0.00001	0.62	***	-0.17	0.15	0.26	0.84	
Wave 8	-0.48	0.08	0.00001	0.62	***	-0.13	0.16	0.42	0.88	
Wave 9	-0.46	0.09	0.00001	0.63	***	-0.31	0.18	0.08	0.73	

Wave 10	-0.42	0.09	0.00001	0.66	***	-0.10	0.19	0.59	0.90	

Chapter 2 Appendix 7 Regression table for fixed effects logistic regression models using HB comparison group, including regional variables

Variable	Estimate	Std error	p value	Odds ratio	Conf 5%	Conf 97.5%
DID	0.095	0.013	0	9.961	0.069	0.121
Benefit: JSA	-0.034	0.022	0.12	-3.308	-0.076	0.009
Benefit: HB	0.001	0.006	0.912	0.065	-0.011	0.012
Age: 21-34	0.016	0.023	0.484	1.629	-0.029	0.061
Age: 25-34	0.049	0.027	0.068	5.066	-0.004	0.102
Age: 45-54	0.08	0.035	0.022	8.334	0.011	0.149
Age: 55-64	0.093	0.04	0.02	9.721	0.015	0.171
Employed	0.036	0.007	0	3.675	0.022	0.051
Disability	0.027	0.007	0	2.686	0.013	0.04
Children in HH	-0.014	0.012	0.224	-1.412	-0.037	0.009
Single in HH	-0.012	0.01	0.23	-1.231	-0.033	0.008
Private tenure	-0.017	0.01	0.088	-1.657	-0.036	0.003
Wave 2	-0.04	0.009	0	-3.954	-0.057	-0.024
Wave 3	-0.03	0.009	0.001	-2.913	-0.047	-0.012
Wave 4	-0.037	0.01	0	-3.584	-0.056	-0.017
Wave 5	-0.038	0.011	0.001	-3.713	-0.059	-0.016
Wave 6	-0.013	0.014	0.338	-1.297	-0.04	0.014
Wave 7	-0.073	0.015	0	-6.997	-0.102	-0.043
Wave 8	-0.075	0.017	0	-7.207	-0.108	-0.041
Wave 9	-0.074	0.019	0	-7.122	-0.111	-0.037
Wave 10	-0.064	0.02	0.001	-6.228	-0.103	-0.025
Area–level characteristics						
Affordability	-0.045	0.032	0.167	-4.372	-0.108	0.019
Housing decile (LA)	-0.006	0.014	0.649	-0.648	-0.034	0.021
Unemployment rate	-0.037	0.024	0.129	-3.601	-0.084	0.011
Region (comparison group London)						
East Midlands	-0.011	0.078	0.889	-1.082	-0.163	0.141
East of England	0.001	0.055	0.989	0.075	-0.108	0.109
North East	0.176	0.091	0.053	19.258	-0.002	0.354

North West	0.077	0.074	0.3	8.018	-0.069	0.223
South East	0.042	0.061	0.495	4.246	-0.078	0.161
South West	-0.034	0.079	0.664	-3.374	-0.189	0.121
West Midlands	-0.012	0.072	0.869	-1.184	-0.154	0.13
Yorkshire and the Humber	-0.045	0.077	0.565	-4.363	-0.196	0.107

Chapter 2 Appendix 8 Regression table for fixed effects logistic regression models using JSA comparison group, including regional variables

Variable	Estimate	Std error	p value	Odds ratio	Conf 5%	Conf 97.5%
DID	0.069	0.018	0	7.136	0.034	0.104
Benefit: JSA	0.022	0.016	0.174	2.2	-0.01	0.053
Benefit: HB	-0.009	0.015	0.54	-0.909	-0.038	0.02
Age: 21-34	0.011	0.023	0.631	1.129	-0.035	0.057
Age: 25-34	0.036	0.031	0.249	3.691	-0.025	0.098
Age: 45-54	0.037	0.058	0.518	3.814	-0.076	0.151
Age: 55-64	0.064	0.071	0.367	6.654	-0.076	0.204
Employed	0.022	0.014	0.109	2.233	-0.005	0.049
Disability	0.013	0.014	0.346	1.299	-0.014	0.04
Children in HH	0.008	0.024	0.721	0.852	-0.038	0.055
Single in HH	-0.04	0.02	0.052	-3.89	-0.08	0
Private tenure	-0.005	0.019	0.786	-0.516	-0.042	0.032
Wave 2	-0.053	0.02	0.007	-5.15	-0.091	-0.015
Wave 3	-0.058	0.02	0.004	-5.644	-0.098	-0.019
Wave 4	-0.029	0.022	0.187	-2.817	-0.071	0.014
Wave 5	-0.054	0.023	0.019	-5.289	-0.1	-0.009
Wave 6	-0.032	0.028	0.25	-3.157	-0.087	0.023
Wave 7	-0.034	0.031	0.27	-3.358	-0.095	0.027
Wave 8	-0.034	0.034	0.317	-3.387	-0.102	0.033
Wave 9	-0.072	0.038	0.06	-6.954	-0.147	0.003
Wave 10	-0.038	0.04	0.348	-3.696	-0.116	0.041
Area–level characteristics						
Affordability	-0.093	0.066	0.157	-8.901	-0.222	0.036
Housing decile (LA)	0.001	0.028	0.984	0.058	-0.055	0.056
Unemployment rate	-0.09	0.047	0.054	-8.624	-0.182	0.002
Region (comparison group London)						
East Midlands	-0.078	0.163	0.632	-7.488	-0.396	0.241
East of England	-0.025	0.095	0.794	-2.448	-0.211	0.161
North East	0.496	0.173	0.004	64.224	0.157	0.835

North West	-0.034	0.12	0.776	-3.347	-0.269	0.201
South East	-0.065	0.127	0.612	-6.254	-0.314	0.185
South West	-0.134	0.128	0.298	-12.516	-0.385	0.118
West Midlands	-0.017	0.137	0.899	-1.723	-0.286	0.251
Yorkshire and the Humber	-0.044	0.144	0.763	-4.261	-0.326	0.239

Chapter 2 Appendix 9 Regression table for fixed effects logistic regression models using HB comparison group, using matched data

Variable	Estimate	Std error	p value	Odds ratio	Conf 5%	Conf 97.5%
DID	0.075	0.024	0.002	7.754	0.028	0.121
Benefit: JSA	0.023	0.074	0.753	2.364	-0.122	0.169
Benefit: HB	-0.024	0.031	0.44	-2.39	-0.086	0.037
Age: 21-34	-0.04	0.083	0.629	-3.925	-0.202	0.122
Age: 25-34	-0.053	0.118	0.651	-5.192	-0.285	0.178
Age: 45-54	-0.075	0.157	0.634	-7.193	-0.382	0.233
Age: 55-64	-0.144	0.174	0.41	-13.374	-0.485	0.198
Employed	0.054	0.031	0.08	5.504	-0.006	0.114
Disability	-0.057	0.029	0.047	-5.58	-0.114	-0.001
Children in HH	-0.024	0.063	0.703	-2.379	-0.148	0.1
Single in HH	-0.128	0.056	0.021	-12.029	-0.237	-0.019
Private tenure	-0.032	0.041	0.437	-3.102	-0.111	0.048
Housing decile	-0.054	0.073	0.465	-5.222	-0.198	0.09
Wave 7	0.058	0.033	0.081	5.92	-0.007	0.122
Wave 8	0.033	0.031	0.296	3.313	-0.029	0.094
Wave 9	0.016	0.031	0.616	1.568	-0.045	0.076
Wave 10	0.055	0.033	0.101	5.604	-0.011	0.12

Chapter 2 Appendix 10 Regression table for fixed effects logistic regression models using JSA comparison group, using matched data

Variable	Estimate	Std error	p value	Odds ratio	Conf 5%	Conf 97.5%
DID	0.083	0.029	0.005	8.61	0.025	0.14
Benefit: JSA	0.09	0.072	0.212	9.428	-0.051	0.232
Benefit: HB	-0.023	0.041	0.568	-2.316	-0.104	0.057
Age: 21-34	0.069	0.099	0.485	7.123	-0.124	0.262
Age: 25-34	0.042	0.137	0.759	4.28	-0.226	0.31
Age: 45-54	-0.031	0.193	0.874	-3.02	-0.41	0.348
Age: 55-64	-0.048	0.218	0.826	-4.687	-0.475	0.379
Employed	0.035	0.04	0.379	3.584	-0.043	0.114
Disability	-0.075	0.037	0.044	-7.228	-0.148	-0.002
Children in HH	-0.026	0.079	0.745	-2.53	-0.18	0.129
Single in HH	-0.104	0.078	0.18	-9.916	-0.257	0.048
Private tenure	-0.008	0.05	0.867	-0.833	-0.106	0.09
Housing decile	-0.056	0.09	0.538	-5.423	-0.233	0.121
Wave 7	0.056	0.044	0.2	5.806	-0.03	0.143
Wave 8	-0.01	0.042	0.804	-1.033	-0.092	0.071
Wave 9	-0.029	0.041	0.484	-2.843	-0.109	0.052
Wave 10	0.022	0.044	0.614	2.243	-0.064	0.108

Chapter 3 Appendix 11 Model without random slopes (full sample)

Random effects

Level	Variance	Std. Dev.
Individual	0.42	0.65
LSOA	1.93	1.39
MSOA	0.07	0.27
JC District	0.000008	0.003

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.25	0.06	0.0001	***
Wave 2	-0.23	0.05	0.00001	***
Wave 3	-0.13	0.05	0.01	*
Wave 4	-0.14	0.05	0.01	*
Wave 5	-0.14	0.06	0.02	*
Wave 6	0.12	0.07	0.07	
Wave 7	-0.25	0.07	0.0007	***
Wave 8	-0.27	0.08	0.0007	***
Wave 9	-0.23	0.09	0.007	**
Wave 10	-0.08	0.09	0.36	
Private rental	-0.48	0.04	0.00001	***
Employed	0.16	0.04	0.00001	***
Age bracket				
21 to 24	0.2	0.09	0.04	*
25 to 34	0.15	0.09	0.11	
35 to 44	0.01	0.09	0.91	
45 to 54	-0.06	0.09	0.49	
55 to 64	-0.34	0.1	0.0008	***

Single in household	0.09	0.04	0.03	*
Disability	0.19	0.03	0.00001	***
Benefit income	-0.00006	0.00002	0.006	**
Number of dependent children	0.009	0.006	0.13	
Area-level variables				
Housing and services decile (LSOA)	-0.008	0.06	0.9	
Unemployment rate (LA)	0.08	0.1	0.43	
Median housing affordability ratio (LA)	0.06	0.15	0.67	
Regions				
East of England	-0.13	0.13	0.35	
London	0.34	0.15	0.02	*
North East	0.12	0.15	0.41	
North West	-0.1	0.12	0.37	
South East	-0.16	0.13	0.21	
South West	-0.33	0.14	0.02	*
West Midlands	-0.17	0.12	0.17	
Yorkshire and the Humber	-0.24	0.12	0.04	*

Chapter 3 Appendix 12 Model outputs with random slopes

12.1 Housing Benefit

Random effects

Level		Variance	Std. Dev.	Corr.
Individual	Intercept	0.19	0.44	
LSOA	Intercept	1.49	1.22	
	Universal Credit	0.8	0.9	-0.07
MSOA	Intercept	0.43	0.66	
	Universal Credit	0.02	0.14	-1.00
JC District	Intercept	0.000005	0.002	

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.008	0.09	0.93	
Wave 2	-0.23	0.06	0.00006	
Wave 3	-0.1	0.06	0.09	
Wave 4	-0.1	0.06	0.1	
Wave 5	-0.04	0.07	0.51	
Wave 6	0.16	0.07	0.03	*
Wave 7	-0.22	0.08	0.005	**
Wave 8	-0.19	0.09	0.03	*
Wave 9	-0.11	0.09	0.22	
Wave 10	0.05	0.1	0.6	
Private rental	-0.34	0.05	0.00001	***
Employed	0.27	0.04	0.00001	***
Age bracket				
21 to 24	0.14	0.13	0.27	
25 to 34	0.14	0.13	0.27	

35 to 44	0.001	0.13	0.99	
45 to 54	-0.11	0.13	0.4	
55 to 64	-0.41	0.14	0.003	**
Single in household	-0.0007	0.05	0.99	
Disability	0.19	0.04	0.00001	***
Benefit income	0.01	0.00003	0.00001	***
Number of dependent children	0.01	0.007	0.05	*
Area-level variables				
Housing and services decile (LSOA)	-0.04	0.07	0.5	
Unemployment rate (LA)	-0.02	0.11	-0.16	
Median housing affordability ratio (LA)	-0.02	0.16	0.9	
Regions				
East of England	-0.04	0.14	0.78	
London	0.34	0.15	0.03	*
North East	0.23	0.15	0.13	
North West	-0.03	0.12	0.8	
South East	-0.07	0.14	0.62	
South West	-0.26	0.15	0.08	
West Midlands	-0.08	0.13	0.56	
Yorkshire and the Humber	-0.17	0.13	0.18	

2.2 Jobseekers Allowance

Random effects

Level		**Variance**	**Std. Dev.**	**Corr.**
Individual	Intercept	0.14	0.37	
LSOA	Intercept	1.6	1.3	
	Universal Credit	0.67	0.82	0.07
MSOA	Intercept	0.28	0.53	

	Universal Credit	0.02	0.13	-1.0
JC District	Intercept	0.00000001	0.0001	

Fixed effects

Variable	**Effect**	**Std. Deviation**	**P value**	**Sig.**
Universal Credit	-0.11	0.1	0.29	
Wave 2	-0.24	0.09	0.006	**
Wave 3	-0.24	0.09	0.007	**
Wave 4	-0.18	0.09	0.05	*
Wave 5	-0.08	0.1	0.39	
Wave 6	0.12	0.11	0.26	
Wave 7	0.02	0.12	0.88	
Wave 8	-0.06	0.13	0.65	
Wave 9	0.01	0.14	0.91	
Wave 10	0.18	0.14	0.21	
Private rental	-0.37	0.07	0.00001	***
Employed	0.08	0.06	0.16	
Age bracket				
21 to 24	0.15	0.12	0.23	
25 to 34	0.18	0.12	0.14	
35 to 44	0.03	0.13	0.83	
45 to 54	0.09	0.13	0.49	
55 to 64	-0.15	0.15	0.29	
Single in household	-0.03	0.07	0.62	
Disability	0.19	0.05	0.005	***
Benefit income	-0.0001	0.00004	0.001	***
Number of dependent children	0.01	0.01	0.14	
Area-level variables				
Housing and services decile (LSOA)	0.05	0.1	0.6	

Unemployment rate (LA)	-0.05	0.17	0.75	
Median housing affordability ratio (LA)	-0.06	0.23	0.8	
Regions				
East of England	-0.2	0.2	0.35	
London	0.49	0.22	0.03	*
North East	0.24	0.21	0.24	
North West	-0.07	0.17	0.66	
South East	0.01	0.19	0.96	
South West	-0.08	0.22	0.72	
West Midlands	-0.11	0.18	0.52	
Yorkshire and the Humber	-0.16	0.17	0.35	

2.3 Income Support

Random effects

Level		Variance	Std. Dev.	Corr.
Individual	Intercept	0.32	0.56	
LSOA	Intercept	1.5	1.22	
	Universal Credit	0.73	0.86	-0.01
MSOA	Intercept	0.04	0.2	
	Universal Credit	0.0004	0.02	0.97
JC District	Intercept	0.000000008	0.00009	

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.013	0.1	0.9	
Wave 2	-0.31	0.08	0.0002	***
Wave 3	-0.03	0.08	0.75	
Wave 4	0.05	0.08	0.52	
Wave 5	0.13	0.09	0.16	
Wave 6	0.37	0.1	0.0002	***
Wave 7	0.06	0.11	0.61	
Wave 8	0.24	0.12	0.04	*
Wave 9	0.3	0.13	0.02	*
Wave 10	0.4	0.13	0.002	**
Private rental	-0.29	0.07	0.00001	***
Employed	0.2	0.58	0.0006	***
Age bracket				
21 to 24	0.06	0.14	0.7	
25 to 34	0.005	0.14	0.97	
35 to 44	-0.05	0.14	0.71	

45 to 54	-0.19	0.14	0.18	
55 to 64	-0.32	0.15	0.03	*
Single in household	0.0009	0.06	0.98	
Disability	0.19	0.05	0.0004	***
Benefit income	-0.0003	0.00003	0.00001	***
Number of dependent children	0.03	0.009	0.0005	***
Area-level variables				
Housing and services decile (LSOA)	0.03	0.09	0.69	
Unemployment rate (LA)	0.17	0.15	0.26	
Median housing affordability ratio (LA)	0.25	0.21	0.22	
Regions				
East of England	0.17	0.18	0.35	
London	0.33	0.2	0.1	
North East	0.38	0.18	0.04	*
North West	0.12	0.15	0.43	
South East	-0.07	0.18	0.69	
South West	-0.35	0.19	0.07	
West Midlands	-0.03	0.16	0.84	
Yorkshire and the Humber	-0.1	0.16	0.53	

2.4 Employment and Support Allowance

Random effects

Level		Variance	Std. Dev.	Corr.
Individual	Intercept	0.19	0.44	
LSOA	Intercept	1.49	1.22	
	Universal Credit	0.8	0.9	-0.07
MSOA	Intercept	0.43	0.66	
	Universal Credit	0.02	0.14	-1.00
JC District	Intercept	0.000005	0.002	

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.15	0.11	0.18	
Wave 2	-0.35	0.11	0.001	**
Wave 3	-0.15	0.11	0.18	
Wave 4	-0.09	0.11	0.42	
Wave 5	-0.05	0.11	0.67	
Wave 6	0.06	0.13	0.61	
Wave 7	-0.14	0.14	0.31	
Wave 8	-0.07	0.14	0.61	
Wave 9	-0.23	0.16	0.62	
Wave 10	0.08	0.16	0.62	
Private rental	-0.15	0.08	0.07	
Employed	0.09	0.07	0.24	
Age bracket				
21 to 24	0.05	0.18	0.8	
25 to 34	-0.04	0.17	0.8	
35 to 44	-0.08	0.17	0.63	

45 to 54	-0.07	0.17	0.16	
55 to 64	-0.26	0.18	0.16	
Single in household	0.005	0.08	0.95	
Disability	0.16	0.07	0.08	
Benefit income	-0.0002	0.00004	0.00001	***
Number of dependent children	0.02	0.01	0.11	
Area-level variables				
Housing and services decile (LSOA)	0.07	0.11	0.54	
Unemployment rate (LA)	-0.006	0.19	0.97	
Median housing affordability ratio (LA)	0.03	0.26	0.91	
Regions				
East of England	-0.33	0.24	0.17	
London	0.42	0.26	0.11	
North East	0.19	0.25	0.45	
North West	0.06	0.19	0.77	
South East	-0.11	0.23	0.62	
South West	-0.19	0.24	0.41	
West Midlands	-0.08	0.21	0.72	
Yorkshire and the Humber	-0.16	0.2	0.42	

2.5 Working Tax Credit

Random effects

Level		Variance	Std. Dev.	Corr.
Individual	Intercept	0.23	0.48	
LSOA	Intercept	1.76	1.33	
	Universal Credit	0.62	0.79	0.22
MSOA	Intercept	0.33	0.57	
	Universal Credit	0.1	0.32	-0.99
JC District	Intercept	0.00003	0.005	

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.14	0.11	0.18	
Wave 2	-0.26	0.07	0.0004	***
Wave 3	-0.13	0.07	0.07	
Wave 4	-0.14	0.08	0.07	
Wave 5	-0.21	0.08	0.009	**
Wave 6	-0.03	0.09	0.7	
Wave 7	-0.51	0.1	0.00001	***
Wave 8	-0.47	0.11	0.00001	***
Wave 9	-0.41	0.11	0.0003	***
Wave 10	-0.34	0.12	0.004	**
Private rental	-0.77	0.06	0.00001	***
Employed	0.11	0.05	0.02	*
Age bracket				
21 to 24	0.26	0.17	0.13	
25 to 34	0.22	0.16	0.17	
35 to 44	0.08	0.17	0.63	

45 to 54	0.05	0.17	0.74	
55 to 64	-0.18	0.18	0.33	
Single in household	0.05	0.06	0.39	
Disability	0.17	0.05	0.0002	***
Benefit income	0.000006	0.00003	0.85	
Number of dependent children	0.004	0.01	0.71	
Area-level variables				
Housing and services decile (LSOA)	-0.02	0.08	0.8	
Unemployment rate (LA)	-0.04	0.14	0.74	
Median housing affordability ratio (LA)	0.24	0.2	0.22	
Regions				
East of England	-0.18	0.17	0.31	
London	0.26	0.19	0.18	
North East	-0.1	0.2	0.63	
North West	-0.007	0.15	0.97	
South East	-0.22	0.17	0.2	
South West	-0.46	0.18	0.01	*
West Midlands	-0.26	0.16	0.1	
Yorkshire and the Humber	-0.25	0.16	0.12	

2.6 Child Tax Credit

Random effects

Level		Variance	Std. Dev.	Corr.
Individual	Intercept	0.27	0.52	
LSOA	Intercept	0.7	0.84	
	Universal Credit	0.81	0.9	0.61
MSOA	Intercept	0.92	0.96	
	Universal Credit	0.58	0.76	-1
JC District	Intercept	0.0001	0.01	

Fixed effects

Variable	Effect	Std. Deviation	P value	Sig.
Universal Credit	0.44	0.13	0.0006	***
Wave 2	-0.51	0.12	0.00004	***
Wave 3	-0.3	0.12	0.02	*
Wave 4	-0.17	0.12	0.18	
Wave 5	-0.29	0.13	0.03	*
Wave 6	-0.25	0.15	0.09	
Wave 7	-0.68	0.16	0.00002	***
Wave 8	-0.44	0.17	0.008	**
Wave 9	-0.44	0.18	0.01	*
Wave 10	-0.31	0.18	0.09	
Private rental	-0.64	0.09	0.00001	***
Employed	0.08	0.08	0.28	
Age bracket				
21 to 24	0.24	0.22	0.28	
25 to 34	-0.004	0.21	0.99	
35 to 44	-0.02	0.21	0.92	

45 to 54	0.19	0.22	0.59	
55 to 64	0.06	0.24	0.82	
Single in household	-0.12	0.1	0.22	
Disability	0.16	0.07	0.03	*
Benefit income	-0.00004	0.00004	0.41	
Number of dependent children	0.03	0.02	0.12	
Area-level variables				
Housing and services decile (LSOA)	0.16	0.11	0.15	
Unemployment rate (LA)	0.14	0.21	0.5	
Median housing affordability ratio (LA)	0.06	0.3	0.85	
Regions				
East of England	-0.14	0.25	0.57	
London	0.41	0.28	0.15	
North East	-0.19	0.28	0.5	
North West	0.02	0.21	0.92	
South East	-0.18	0.24	0.47	
South West	-0.27	0.26	0.3	
West Midlands	-0.08	0.23	0.72	
Yorkshire and the Humber	-0.3	0.23	0.19	

Chapter 3 Appendix 13 Model output for overall sample excluding area-based explanatory variables

Random effects

Level		**Variance**	**Std. Dev.**	**Corr.**
Individual	Intercept	0.41	0.64	
LSOA	Intercept	1.91	1.38	
	Universal Credit	0.17	0.41	0.23
MSOA	Intercept	0.09	0.3	
	Universal Credit	0.001	0.03	-0.81
JC District	Intercept	0.00001	0.002	

Fixed effects

Variable	**Effect**	**Std. Deviation**	**P value**	**Sig.**
Universal Credit	0.19	0.09	0.04	*
Wave 2	-0.25	0.05	0.000001	***
Wave 3	-0.15	0.05	0.005	**
Wave 4	-0.14	0.05	0.009	**
Wave 5	-0.16	0.06	0.004	**
Wave 6	0.07	0.05	0.18	
Wave 7	-0.28	0.06	0.000001	***
Wave 8	-0.29	0.06	0.000001	***
Wave 9	-0.26	0.06	0.00003	***
Wave 10	-0.14	0.07	0.04	*
Private rental	-0.53	0.04	0.000001	***
Employed	0.18	0.03	0.000001	***
Age bracket				
21 to 24	0.25	0.09	0.008	**
25 to 34	0.18	0.09	0.04	*

35 to 44	0.03	0.09	0.74	
45 to 54	-0.04	0.09	0.7	
55 to 64	-0.3	0.1	0.004	**
Single in household	0.07	0.04	0.09	
Disability	0.19	0.03	0.000001	***
Benefit income	-0.00006	0.00002	0.01	*
Number of dependent children	0.01	0.006	0.09	
Regions				
East of England	-0.15	0.13	0.24	
London	0.38	0.11	0.0003	***
North East	0.11	0.14	0.43	
North West	-0.13	0.12	0.25	
South East	-0.14	0.12	0.25	
South West	-0.32	0.13	0.01	*
West Midlands	-0.18	0.12	0.15	
Yorkshire and the Humber	-0.24	0.12	0.05	*

Chapter 3 Appendix 14 Caterpillar plots of the variation in Universal Credit's effect on housing payment problems across LSOAs and MSOAs

Figure 1 - Housing Benefit comparison group

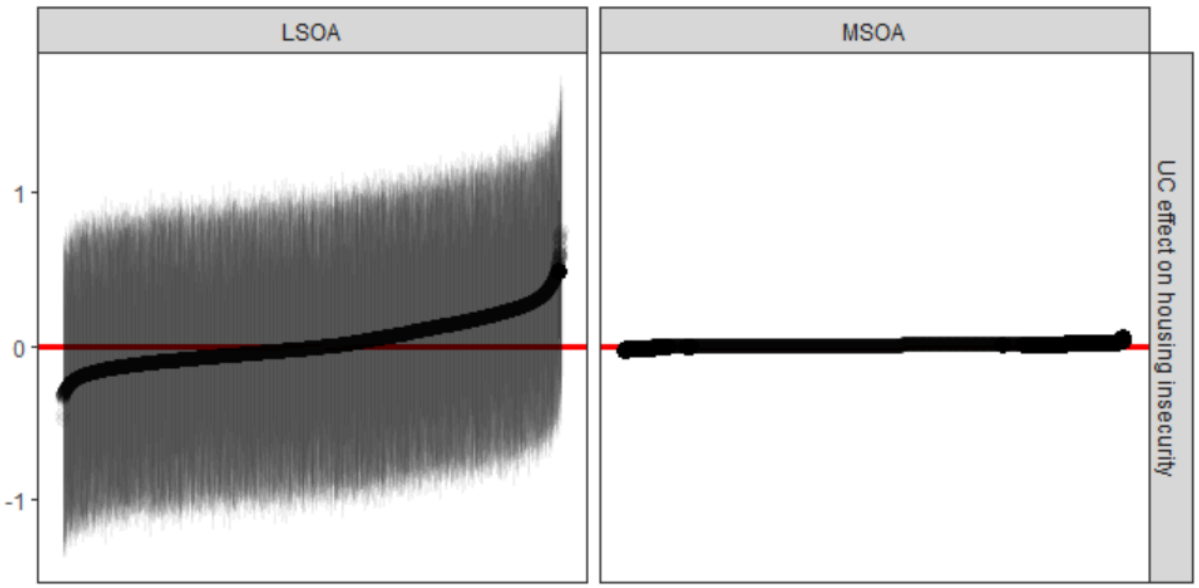


Figure 2 - Jobseeker's Allowance comparison group

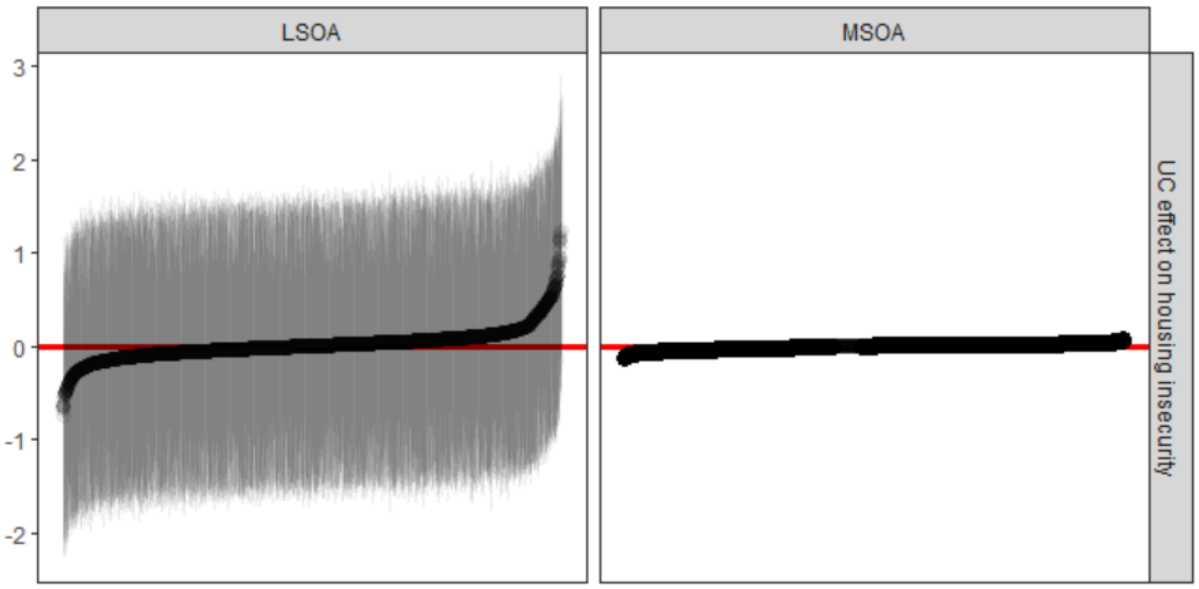


Figure 3 - Working Tax Credit comparison group

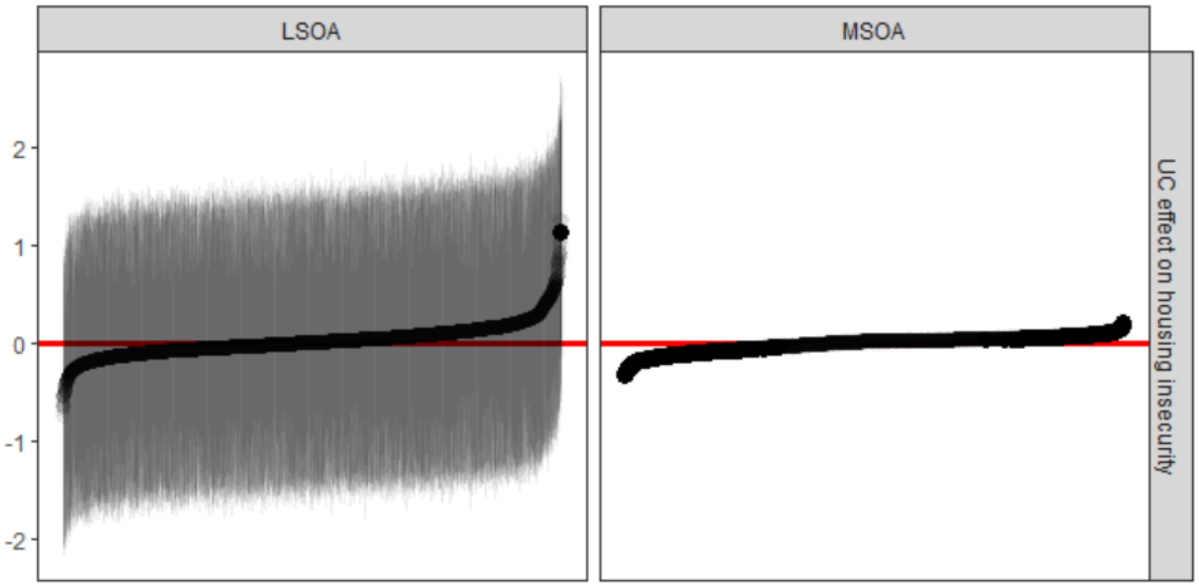


Figure 4 - Child Tax Credit comparison group

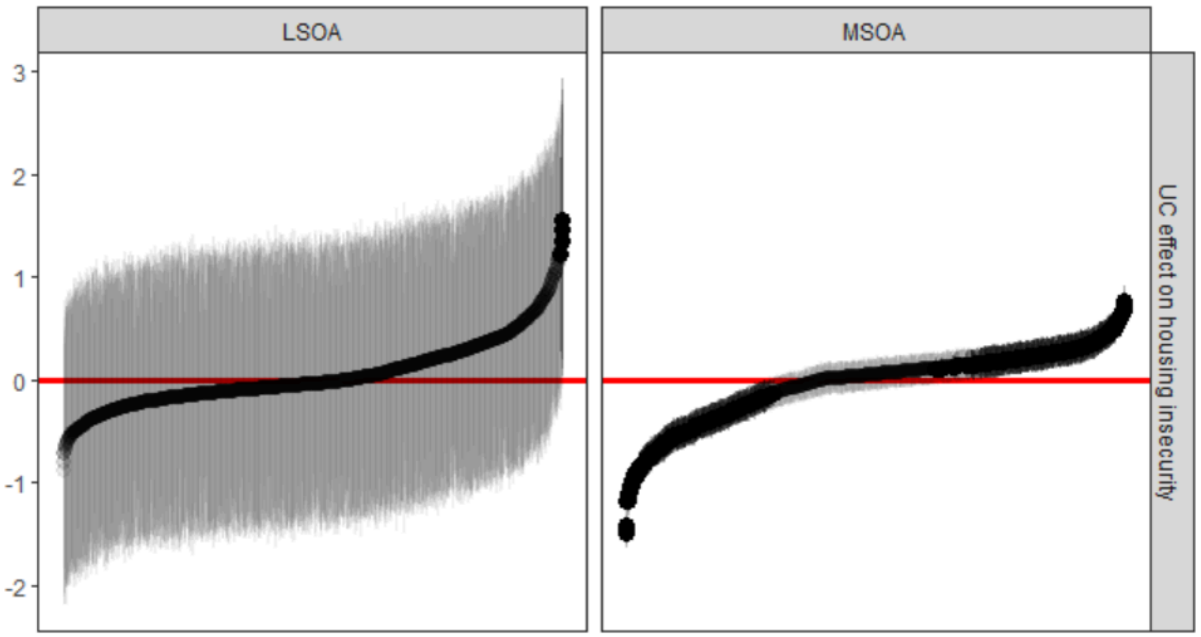


Figure 5 - Income Support comparison group

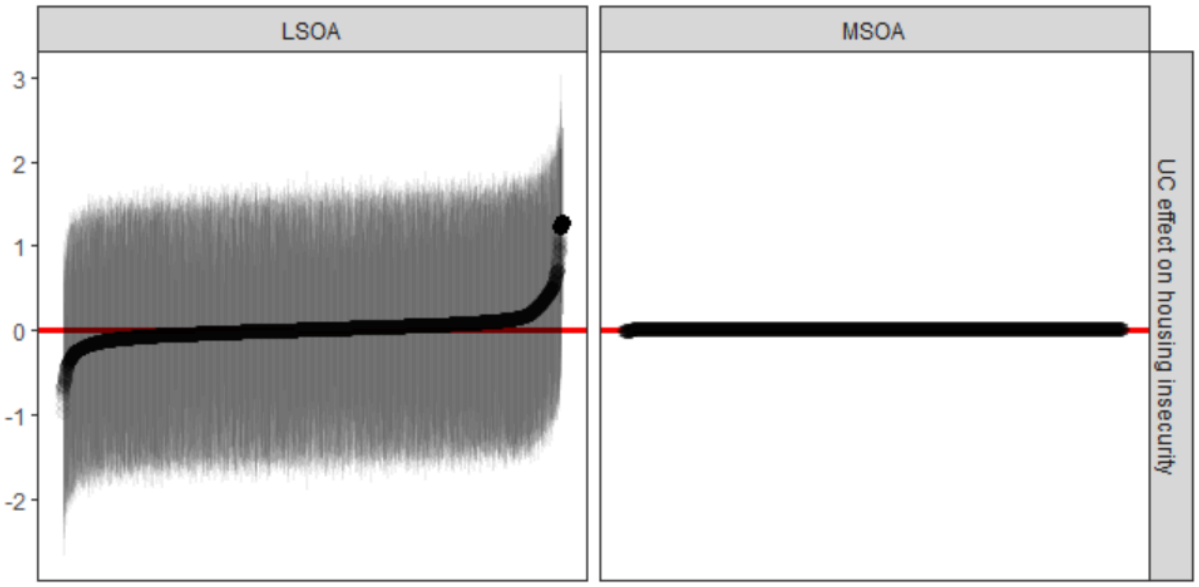
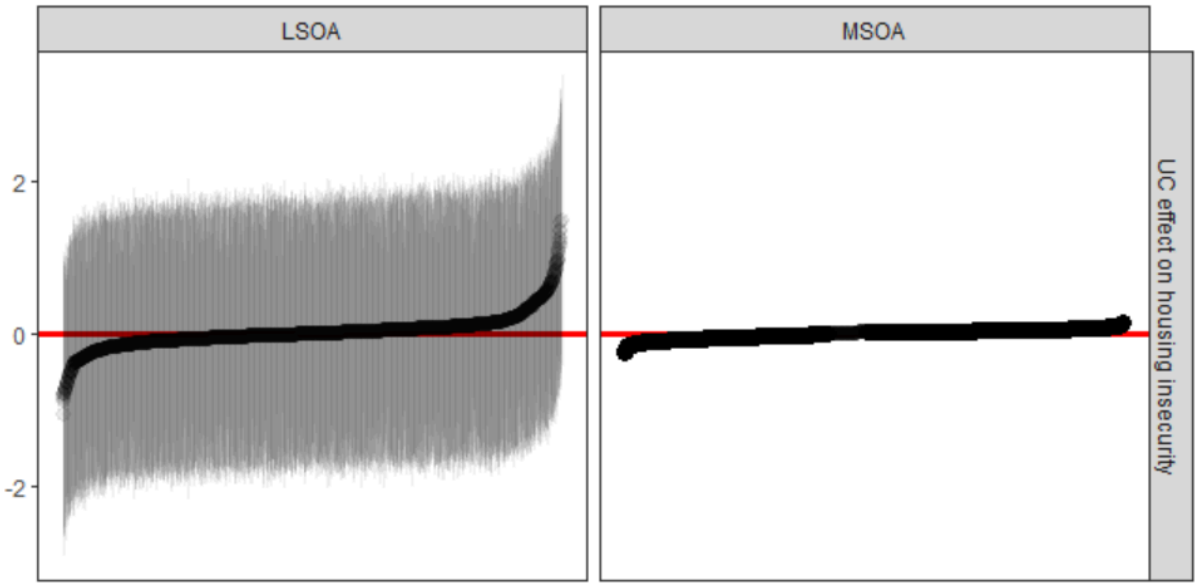


Figure 6 - Employment and Support Allowance comparison group



Chapter 3 Appendix 15 Significant areas in CTC model with largest UC effect sizes

Largest positive effect sizes, indicating UC associated with higher housing insecurity:

MSOA code	MSOA name	UC effect
E02003016	Upper Horfield (Bristol)	0.73
E02000741	Plaistow South	0.69
E02001433	Southport High Park	0.68
E02003799	Blacon South	0.68
E02000868	Bethnal Green North West	0.67
E02001323	Leigh South	0.66
E02000865	Bethnal Green North East	0.65
E02003592	Yarmouth & Freshwater	0.65
E02000700	Merton Church Road & Phipps Bridge	0.64
E02002950	Sutton Hill	0.63

Largest negative effect sizes, indicating UC associated with lower housing insecurity:

MSOA code	MSOA name	UC effect
E02005049	Kingsdown & St Margaret's-at-Cliffe	-1.4823591
E02001141	Central Rochdale & Mandale Park	-1.4746694
E02002307	Dalton Long Lane	-1.4149682
E02002030	Amblecote West & Stambermill	-1.1846607
E02002009	Kates Hill	-1.1788093
E02005992	South Wantage, Harwell & Blewbury	-1.1330044
E02005025	South Canterbury	-1.1277743
E02001542	Stainforth	-1.1269821
E02003415	Chalvey	-1.1266337
E02006918	Clapton Leaside	-1.0935186

Chapter 4 Appendix 16 Logistic regression results for Global Financial Crisis sample

Variable	Estimate	Std. error	P value	Sig.	Odds ratio
Years since GFC (reference category: 0 - data collection period 2009-2011)					
-6 (2003)	-0.62	0.23	0.01	**	0.54
-5 (2004)	-0.55	0.22	0.01	*	0.58
-4 (2005)	-0.11	0.2	0.57		0.89
-3 (2006)	-0.07	0.19	0.71		0.93
-2 (2007)	-0.34	0.2	0.09		0.71
-1 (2008)	-0.05	0.19	0.77		0.95
1 (2010-12)	2.33	0.15	<0.0001	***	10.26
2 (2011-13)	2.24	0.15	<0.0001	***	9.36
3 (2012-14)	2.2	0.15	<0.0001	***	9
4 (2013-15)	2.19	0.15	<0.0001	***	8.93
5 (2014-16)	2.06	0.15	<0.0001	***	7.83
Age bracket (reference category: 18-20)					
21 to 24	0.15	0.09	0.09		1.16
25 to 34	0.04	0.13	0.78		1.04
35 to 44	0.07	0.16	0.68		1.07
45 to 54	0.12	0.19	0.52		1.13
55 to 64	0.22	0.22	0.32		1.25
Employed	0.08	0.05	0.06		1.09
Income (unit: £1000)	-0.09	0.03	0.0003	***	0.91
Claims Housing Benefit	-0.14	0.05	0.005	**	0.87
Disability	-0.01	0.04	0.91		1
Number of children	0.07	0.03	0.02	*	1.07
Private rental	-0.05	0.09	0.59		0.95
Social rental	0.12	0.1	0.21		1.13

Chapter 4 Appendix 17 Logistic regression results for welfare reform sample

Variable	Estimate	Std. error	P value	Sig.	Odds ratio
Years since welfare reform (reference category: 0 - data collection period 2014-16)					
-4 (2010-12)	0.26	0.04	<0.0001	***	1.3
-3 (2011-13)	0.17	0.04	<0.0001	***	1.18
-2 (2012-14)	0.13	0.04	<0.0001	***	1.14
-1 (2013-15)	0.12	0.04	0.002	**	1.13
1 (2015-17)	0.18	0.04	<0.0001	***	1.2
2 (2016-18)	-0.17	0.04	<0.0001	***	0.85
3 (2017-19)	-0.3	0.04	<0.0001	***	0.74
4 (2018-20)	-0.39	0.05	<0.0001	***	0.68
5 (2019-21)	-0.42	0.05	<0.0001	***	0.65
Age bracket (reference category: 18-20)					
21 to 24	0.16	0.06	0.01	**	1.17
25 to 34	0.19	0.08	0.02	*	1.21
35 to 44	0.22	0.11	0.03	*	1.25
45 to 54	0.28	0.13	0.03	*	1.33
55 to 64	0.27	0.15	0.07		1.31
Employed	0.07	0.03	0.04	*	1.07
Income (unit: £1000)	-0.09	0.02	<0.0001	***	0.91
Claims Housing Benefit	-0.12	0.04	0.001	**	0.89
Disability	0.07	0.03	0.01	*	1.08
Number of children	0.03	0.02	0.15		1.03
Private rental	0.11	0.06	0.06		1.12
Social rental	0.3	0.07	<0.0001	***	1.36

Chapter 4 Appendix 18 Employment interacted with Years Before/Since event regression results

Global Financial Crisis sample

Variable	Estimate	Std. error	P value	Odds ratio
Employed	0.01	0.29	0.97	1.01
Income	-0.09	0.03	0.0002	0.91
Housing Benefit	-0.14	0.05	0.01	0.87
Disability	-0.01	0.04	0.88	0.99
Number of children	0.07	0.03	0.02	1.07
Age bracket (reference category: 18-20)				
Age: 21-34	0.13	0.09	0.16	1.14
Age: 25-34	0.01	0.13	0.96	1.01
Age: 35-44	0.04	0.16	0.82	1.04
Age: 45-54	0.1	0.19	0.61	1.1
Age: 55-64	0.2	0.23	0.38	1.22
Private rental	-0.05	0.09	0.57	0.95
Social rental	0.12	0.1	0.22	1.13
Years since GFC (reference category: 0 - data collection period 2009-2011)				
-6 Years Since Event	-0.8	0.38	0.04	0.45
-5 Years Since Event	-0.91	0.37	0.01	0.4
-4 Years Since Event	0.05	0.32	0.89	1.05
-3 Years Since Event	-0.06	0.31	0.85	0.94
-2 Years Since Event	-0.06	0.31	0.83	0.94
-1 Years Since Event	0.25	0.29	0.39	1.29
1 Years Since Event	2.26	0.23	<0.0001	9.59
2 Years Since Event	2.08	0.23	<0.0001	8.04
3 Years Since Event	2.14	0.23	<0.0001	8.48
4 Years Since Event	2.13	0.24	<0.0001	8.44
5 Years Since Event	2.12	0.24	<0.0001	8.3
Employment * Year -6	0.28	0.47	0.55	1.33
Employment * Year -5	0.55	0.46	0.23	1.73
Employment * Year -4	-0.26	0.41	0.52	0.77
Employment * Year -3	-0.03	0.4	0.93	0.97
Employment * Year -2	-0.51	0.42	0.22	0.6
Employment * Year -1	-0.53	0.39	0.18	0.59
Employment * Year 1	0.1	0.29	0.75	1.1

Employment * Year 2	0.23	0.29	0.42	1.26
Employment * Year 3	0.08	0.29	0.77	1.09
Employment * Year 4	0.08	0.29	0.78	1.08
Employment * Year 5	-0.09	0.3	0.76	0.91

Welfare reforms sample

Variable	**Estimate**	**Std. error**	**P value**	**Odds ratio**
Employed	-0.01	0.06	0.9	0.99
Income	-0.09	0.02	<0.0001	0.91
Housing Benefit	-0.11	0.04	<0.0001	0.9
Disability	0.07	0.03	0.02	1.07
Number of children	0.03	0.02	0.13	1.03
Age bracket (reference category: 18-20)				
Age: 21-34	0.11	0.06	0.06	1.12
Age: 25-34	0.14	0.08	0.09	1.15
Age: 35-44	0.17	0.11	0.11	1.18
Age: 45-54	0.24	0.13	0.06	1.28
Age: 55-64	0.23	0.15	0.13	1.26
Private rental	0.11	0.06	0.08	1.11
Social rental	0.29	0.07	<0.0001	1.34
Years since welfare reform (reference category: 0 - data collection period 2014-16)				
-4 Years Since Event	0.12	0.06	0.05	1.13
-3 Years Since Event	-0.05	0.06	0.38	0.95
-2 Years Since Event	0	0.06	0.94	1
-1 Years Since Event	0	0.06	0.96	1
1 Years Since Event	0.14	0.06	0.03	1.15
2 Years Since Event	-0.14	0.07	0.04	0.87
3 Years Since Event	-0.17	0.07	0.02	0.84
4 Years Since Event	-0.19	0.08	0.01	0.82
5 Years Since Event	-0.2	0.08	0.01	0.82
Employment * Year -4	0.23	0.08	<0.0001	1.25
Employment * Year -3	0.36	0.08	<0.0001	1.43
Employment * Year -2	0.19	0.08	0.01	1.21
Employment * Year -1	0.19	0.08	0.02	1.21
Employment * Year 1	0.07	0.08	0.37	1.07
Employment * Year 2	-0.03	0.09	0.69	0.97

Employment * Year 3	-0.17	0.09	0.05	0.84
Employment * Year 4	-0.28	0.1	<0.0001	0.76
Employment * Year 5	-0.31	0.1	<0.0001	0.73
Employment * Year 2	0.23	0.29	0.42	1.26
Employment * Year 3	0.08	0.29	0.77	1.09
Employment * Year 4	0.08	0.29	0.78	1.08
Employment * Year 5	-0.09	0.3	0.76	0.91

Chapter 4 Appendix 19 Tenure interacted with Years Before/Since event regression results

Global Financial Crisis sample

Variable	Estimate	Std. error	P value	Odds ratio
Employed	0.09	0.05	0.05	1.09
Income	-0.09	0.03	0.0001	0.91
Housing Benefit	-0.13	0.05	0.01	0.88
Disability	0	0.04	0.98	1
Number of children	0.07	0.03	0.02	1.07
Age bracket (reference category: 18-20)				
Age: 21-34	0.15	0.09	0.09	1.17
Age: 25-34	0.07	0.13	0.62	1.07
Age: 35-44	0.09	0.16	0.56	1.1
Age: 45-54	0.14	0.19	0.45	1.15
Age: 55-64	0.23	0.23	0.3	1.26
Private rental	0.22	0.41	0.59	1.24
Social rental	0.32	0.33	0.34	1.37
Years since GFC (reference category: 0 - data collection period 2009-2011)				
-6 Years Since Event	-1.11	0.41	0.01	0.33
-5 Years Since Event	-0.66	0.37	0.08	0.52
-4 Years Since Event	-0.17	0.32	0.6	0.84
-3 Years Since Event	-0.15	0.32	0.63	0.86
-2 Years Since Event	-0.15	0.32	0.63	0.86
-1 Years Since Event	-0.61	0.36	0.09	0.54
1 Years Since Event	2.41	0.25	<0.0001	11.17
2 Years Since Event	2.48	0.25	<0.0001	12
3 Years Since Event	2.33	0.25	<0.0001	10.33
4 Years Since Event	2.39	0.25	<0.0001	10.96
5 Years Since Event	2.2	0.25	<0.0001	9.02
Private rental * Year -6	0.97	0.66	0.14	2.64
Private rental * Year -5	0.7	0.6	0.24	2.01
Private rental * Year -4	-0.77	0.69	0.26	0.46
Private rental * Year -3	-0.01	0.6	0.98	0.99
Private rental * Year -2	-0.81	0.69	0.24	0.44
Private rental * Year -1	0.78	0.57	0.17	2.17

Private rental * Year 1	-0.26	0.41	0.52	0.77
Private rental * Year 2	-0.42	0.41	0.3	0.66
Private rental * Year 3	-0.24	0.41	0.56	0.79
Private rental * Year 4	-0.5	0.41	0.22	0.6
Private rental * Year 5	-0.29	0.41	0.47	0.75
Social rental * Year -6	0.66	0.52	0.21	1.93
Social rental * Year -5	-0.15	0.5	0.77	0.86
Social rental * Year -4	0.35	0.43	0.42	1.42
Social rental * Year -3	0.2	0.43	0.64	1.22
Social rental * Year -2	-0.2	0.44	0.65	0.82
Social rental * Year -1	0.84	0.44	0.06	2.31
Social rental * Year 1	-0.1	0.33	0.76	0.91
Social rental * Year 2	-0.45	0.33	0.16	0.63
Social rental * Year 3	-0.25	0.33	0.44	0.78
Social rental * Year 4	-0.29	0.33	0.38	0.75
Social rental * Year 5	-0.24	0.33	0.47	0.79

Welfare reform sample

Variable	**Estimate**	**Std. error**	**P value**	**Odds ratio**
Employed	0.06	0.03	0.07	1.06
Income	-0.09	0.02	<0.0001	0.91
Housing Benefit	-0.09	0.04	0.02	0.92
Disability	0.07	0.03	0.03	1.07
Number of children	0.03	0.02	0.08	1.03
Age bracket (reference category: 18-20)				
Age: 21-34	0.15	0.06	0.01	1.16
Age: 25-34	0.15	0.08	0.06	1.17
Age: 35-44	0.18	0.11	0.09	1.19
Age: 45-54	0.26	0.13	0.04	1.29
Age: 55-64	0.24	0.15	0.11	1.28
Private rental	0.11	0.09	0.25	1.12
Social rental	0.17	0.09	0.05	1.19
Years since welfare reform (reference category: 0 - data collection period 2014-16)				
-4 Years Since Event	0.26	0.06	<0.0001	1.29
-3 Years Since Event	0.3	0.06	<0.0001	1.35
-2 Years Since Event	0.15	0.06	0.01	1.16

-1 Years Since Event	0.2	0.06	<0.0001	1.22
1 Years Since Event	0.14	0.06	0.02	1.15
2 Years Since Event	-0.13	0.06	0.04	0.88
3 Years Since Event	-0.43	0.07	<0.0001	0.65
4 Years Since Event	-0.86	0.08	<0.0001	0.42
5 Years Since Event	-0.92	0.09	<0.0001	0.4
Private rental * Year -4	-0.09	0.1	0.36	0.91
Private rental * Year -3	-0.19	0.1	0.06	0.83
Private rental * Year -2	0	0.1	0.97	1
Private rental * Year -1	-0.24	0.1	0.02	0.79
Private rental * Year 1	-0.17	0.1	0.11	0.85
Private rental * Year 2	-0.2	0.11	0.07	0.82
Private rental * Year 3	-0.07	0.12	0.54	0.93
Private rental * Year 4	0.73	0.13	<0.0001	2.08
Private rental * Year 5	0.68	0.13	<0.0001	1.97
Social rental * Year -4	0.06	0.08	0.48	1.06
Social rental * Year -3	-0.27	0.08	<0.0001	0.76
Social rental * Year -2	-0.06	0.08	0.45	0.94
Social rental * Year -1	-0.09	0.08	0.3	0.92
Social rental * Year 1	0.2	0.09	0.02	1.22
Social rental * Year 2	0.02	0.09	0.82	1.02
Social rental * Year 3	0.37	0.1	<0.0001	1.45
Social rental * Year 4	0.73	0.11	<0.0001	2.08
Social rental * Year 5	0.8	0.11	<0.0001	2.24

Chapter 4 Appendix 20 Rental costs interacted with Years Before/Since event regression results

Global Financial Crisis sample

Variable	Estimate	Std. error	P value	Odds ratio
Employed	0.2	0.05	0.0004	1.22
Income	-0.12	0.04	0.005	0.88
Housing Benefit	-0.12	0.05	0.02	0.88
Disability	0.11	0.05	0.05	1.11
Number of children	-0.02	0.03	0.56	0.97
Age bracket (reference category: 18-20)				
Age: 21-34	0.07	0.11	0.55	1.07
Age: 25-34	0.009	0.16	0.95	1.01
Age: 35-44	0.11	0.21	0.56	1.12
Age: 45-54	0.17	0.24	0.48	1.19
Age: 55-64	0.44	0.3	0.14	1.55
Social rental	0.1	0.07	0.18	1.11
Rental costs	0.001	0.0008	0.09	1.01
Years since GFC (reference category: 0 - data collection period 2009-2011)				
-6 Years Since Event	-0.23	0.34	0.5	0.7928
-5 Years Since Event	-0.81	0.37	0.02	0.4419
-4 Years Since Event	0.23	0.32	0.45	1.2709
-3 Years Since Event	0.33	0.31	0.29	1.3934
-2 Years Since Event	-0.18	0.33	0.57	0.827
-1 Years Since Event	0.62	0.3	0.03	1.8651
1 Years Since Event	2.42	0.24	<0.0001	11.3182
2 Years Since Event	2.16	0.24	<0.0001	8.7221
3 Years Since Event	2.2	0.24	<0.0001	9.0505
4 Years Since Event	2.1	0.24	<0.0001	8.9535
5 Years Since Event	2.09	0.25	<0.0001	8.1394
Rent * Year -6	0.0003	0.001	0.81	1.0003
Rent * Year -5	0.002	0.001	0.05	1.002
Rent * Year -4	-0.001	0.001	0.28	0.99
Rent * Year -3	-0.002	0.001	0.06	0.99
Rent * Year -2	-0.001	0.001	0.16	0.99
Rent * Year -1	-0.002	0.001	0.04	0.99

Rent * Year 1	-0.001	0.0008	0.08	0.99
Rent * Year 2	-0.001	0.0008	0.14	0.99
Rent * Year 3	-0.001	0.0008	0.14	0.99
Rent * Year 4	-0.001	0.0008	0.09	0.99
Rent * Year 5	-0.001	0.0008	0.1	0.99

Welfare reform sample

Variable	**Estimate**	**Std. error**	**P value**	**Odds ratio**
Employed	0.16	0.04	<0.0001	1.2
Income	-0.17	0.02	<0.0001	0.83
Housing Benefit	-0.09	0.03	0.01	0.91
Disability	0.17	0.03	<0.0001	1.1
Number of children	0.008	0.02	0.71	1.1
Age bracket (reference category: 18-20)				
Age: 21-34	0.02	0.01	0.31	1.07
Age: 25-34	0.13	0.1	0.18	1.14
Age: 35-44	0.19	0.13	0.15	1.21
Age: 45-54	0.32	0.16	0.04	1.39
Age: 55-64	0.44	0.19	0.02	1.56
Social rental	0.15	0.05	0.004	1.16
Rental costs	0.0002	0.0001	0.11	1.0002
Years since welfare reform (reference category: 0 - data collection period 2014-16)				
-4 Years Since Event	0.29	0.06	<0.0001	1.34
-3 Years Since Event	0.03	0.06	0.61	1.03
-2 Years Since Event	0.07	0.06	0.23	1.07
-1 Years Since Event	0.08	0.05	0.14	1.09
1 Years Since Event	0.29	0.06	<0.0001	1.34
2 Years Since Event	-0.05	0.07	0.47	0.95
3 Years Since Event	-0.16	0.06	0.02	0.84
4 Years Since Event	-0.12	0.06	0.06	0.87
5 Years Since Event	-0.12	0.08	0.15	0.88
Rent * Year -4	-0.0002	0.0001	0.25	0.99
Rent * Year -3	0.0001	0.0001	0.47	1.0001
Rent * Year -2	0.0001	0.0001	0.5	1.0001
Rent * Year -1	-0.0001	0.0001	0.3	0.99
Rent * Year 1	-0.0003	0.0001	0.02	0.99

Rent * Year 2	-0.0005	0.0002	0.0008	0.99
Rent * Year 3	-0.0003	0.0001	0.06	0.99
Rent * Year 4	-0.0002	0.0001	0.15	0.99
Rent * Year 5	-0.0003	0.0002	0.09	0.99

Appendix 21 Understanding Society information

This thesis uses the Understanding Society dataset, which is a longitudinal survey of households in the UK. Data is collected from participating households once per year through face-to-face interviews or self-completed online surveys (Understanding Society, Main survey). Survey topics include a wide range of social and economic factors. Understanding Society carries on from the British Household Panel Survey (1991-2009) and includes over 6000 British Household Panel Survey participants (Understanding Society, Survey timeline).

Sampling strategy	The Understanding Society sample consists of several sample components: ● The General Population Sample is made up of a clustered and stratified sample of approximately 24000 households in Great Britain and a simple random sample of approximately 2000 households in Northern Ireland. ● The Ethnic Minority Boost Sample consists of an additional approximately 4000 households in which at least one household member is a member of an ethnic minority, selected from areas with a high proportion of residents from ethnic minorities. ● The Immigrant and Ethnic Minority Boost Sample was added in Wave 6 (2013-15) and consists of approximately 2900 households in which at least one household member is a member of an ethnic minority or was born outside the UK, selected from areas with a high proportion of residents from ethnic minorities. ● The British Household Panel Survey sample was added in Wave 2 (2010-2012) and consists of approximately 8000 households who took part in the British Household Panel Survey. (Understanding Society, Study design)

Sample size and coverage	Approximately 40,000 households were included in data collection wave 1 (Understanding Society, Main survey). Data is collected from approximately 25000 households per year (CFE, 2022) (0.09% of 2022 UK population).
Response mode	Data is collected from participating households once per year through face-to-face interviews or self-completed online surveys (Understanding Society, Main survey).
Attrition and non-response	The General Population Sample (GPS has lost 60.1% of initial wave respondents between Waves 2 and 11. The Immigrant and Ethnic Minority Boost (IEMB) sample has lost 67.3% of the initial wave respondents between Waves 6 to 11 (Cabrera-Álvarez, James & Lynn, 2023; Understanding Society, Response rates).

Appendix 22 Descriptive statistics for legacy benefit claimants

22.1 Table of descriptive statistics for working age Understanding Society sample claiming Housing Benefit pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		24%	
		0/No		76%	
Housing tenure		Social rental		68%	
		Private rental		28%	
		Owned outright		0.7%	
		Owned with mortgage		2.6%	
		Other/missing		0.7%	
Employment status		Employed		25%	
		Not employed		75%	
		Other/missing		0.2%	
Age bracket		18 to 20		0.9%	
		21 to 24		4.6%	
		25 to 34		22%	
		35 to 44		28%	
		45 to 54		25%	
		55 to 64		19%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		52%	
		No disability		48%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		58%	
		No (partner)		42%	
Number of dependent children in household		0		40%	
		1		21%	
		2		20%	
		3+		19%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	1420	1298	0	8536
Income	Net monthly hh income (unit: £1000)	1.9	1.7	-4.4	24

22.2 Table of descriptive statistics for working age Understanding Society sample claiming Jobseeker's Allowance pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		23%	
		0/No		77%	
Housing tenure		Social rental		50%	
		Private rental		19%	
		Owned outright		11%	
		Owned with mortgage		18%	
		Other/missing		1%	
Employment status		Employed		6%	
		Not employed		94%	
		Other/missing		0.3%	
Age bracket		18 to 20		6.9%	
		21 to 24		16%	
		25 to 34		24%	
		35 to 44		20%	
		45 to 54		21%	
		55 to 64		12%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		33%	
		No disability		67%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		34%	
		No (partner)		66%	
Number of dependent children in household		0		66%	
		1		14%	
		2		11%	
		3+		9%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	1.11	0.99	0	8
Income	Net monthly hh income (unit: £1000)	1.9	1.6	-4.4	18.6

22.3 Table of descriptive statistics for working age Understanding Society sample claiming Child Tax Credit pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		14%	
		0/No		86%	
Housing tenure		Social rental		26%	
		Private rental		18%	
		Owned outright		11%	
		Owned with mortgage		44%	
		Other/missing		0.6%	
Employment status		Employed		74%	
		Not employed		26%	
		Other/missing		0.2%	
Age bracket		18 to 20		0.6%	
		21 to 24		1.4%	
		25 to 34		20%	
		35 to 44		40%	
		45 to 54		32%	
		55 to 64		8%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		29%	
		No disability		71%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		11%	
		No (partner)		89%	
Number of dependent children in household		0		4.9%	
		1		29%	
		2		39%	
		3+		27%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	0.9	0.7	0	5.7
Income	Net monthly hh income (unit: £1000)	2.8	2.5	-0.5	41

22.4 Table of descriptive statistics for working age Understanding Society sample claiming Working Tax Credit pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		20%	
		0/No		80%	
Housing tenure		Social rental		31%	
		Private rental		22%	
		Owned outright		11%	
		Owned with mortgage		35%	
		Other/missing		0.7%	
Employment status		Employed		82%	
		Not employed		18%	
		Other/missing		0.2%	
Age bracket		18 to 20		0.2%	
		21 to 24		2.5%	
		25 to 34		23%	
		35 to 44		39%	
		45 to 54		27%	
		55 to 64		7.8%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		28%	
		No disability		72%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		36%	
		No (partner)		64%	
Number of dependent children in household		0		14%	
		1		29%	
		2		33%	
		3+		23%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	0.98	0.85	0	8.8
Income	Net monthly hh income (unit: £1000)	2.5	2.3	-1.4	106

22.5 Table of descriptive statistics for working age Understanding Society sample claiming Income Support pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		18%	
		0/No		82%	
Housing tenure		Social rental		63%	
		Private rental		19%	
		Owned outright		7%	
		Owned with mortgage		10%	
		Other/missing		0.7%	
Employment status		Employed		6%	
		Not employed		94%	
		Other/missing		0.1%	
Age bracket		18 to 20		2.8%	
		21 to 24		7.4%	
		25 to 34		25%	
		35 to 44		24%	
		45 to 54		23%	
		55 to 64		17%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		54%	
		No disability		46%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		68%	
		No (partner)		32%	
Number of dependent children in household		0		39%	
		1		21%	
		2		19%	
		3+		19%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	1.6	1.4	0	8.5
Income	Net monthly hh income (unit: £1000)	1.9	1.7	0	35

22.6 Table of descriptive statistics for working age Understanding Society sample claiming Employment and Support Allowance pooled over all data collection waves (2009-2020)

Variable	**Measurement**	**Proportion**			
		Response		*Proportion*	
Housing payment problems	Self-reported variable of whether the respondent has experienced housing payment problems in the last 12 months	1/Yes		19%	
		0/No		81%	
Housing tenure		Social rental		55%	
		Private rental		16%	
		Owned outright		13%	
		Owned with mortgage		15%	
		Other/missing		0.8%	
Employment status		Employed		6%	
		Not employed		94%	
		Other/missing		0.2%	
Age bracket		18 to 20		1.6%	
		21 to 24		4.7%	
		25 to 34		15%	
		35 to 44		20%	
		45 to 54		30%	
		55 to 64		28%	
Disability status	Self-reported variable of whether the respondent has a disability or long term health condition	Disability		90%	
		No disability		10%	
Single in household	Whether or not the respondent has a partner in the household	Yes (single)		58%	
		No (partner)		42%	
Number of dependent children in household		0		70%	
		1		12%	
		2		11%	
		3+		8%	
		Mean	*Median*	*Min*	*Max*
Benefit income	Monthly hh benefit income (unit: £1000)	1.5	1.3	0	5.1
Income	Net monthly hh income (unit: £1000)	2.2	1.9	0	91