Final Report

Underemployment and housing insecurity: an empirical analysis of HILDA data

authored by

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AIHW	Australian Institute of Health and Welfare
ANZSCO	Australian and New Zealand Standard Classification of Occupation
CPI	Consumer Price Index
CRA	Commonwealth Rent Assistance
FE	Fixed Effects
GFC	Global Financial Crisis
HEF	Housing Establishment Fund (Victoria)
HILDA	Household Income and Labour Dynamics in Australia
ICLS	International Conference of Labour Statisticians
ISPs	Income Support Payments
MIAESR	Melbourne Institute of Applied Economic and Social Research
NLF	Not in the Labour Force
NRAS	National Rental Affordability Scheme
NSW	New South Wales
OLS	Ordinary Least Square
RE	Random Effects
SA	South Australia
SCRGSP	Steering Committee for the Review of Government Service Provision
SIHC	Survey of Income and Housing Costs
WA	West Australia

EXECUTIVE SUMMARY

Time-related underemployment, hereafter just called underemployment, can be broadly understood as employment that is insufficient in terms of the number of hours of paid work (Campbell et al. 2013, pp.9–11, 16–18, 67–70; see ILO 2013, p.9). The concept of underemployment is closely linked to that of unemployment since both involve insufficient hours of paid work and both are identified in official statistics as aspects of labour force underutilisation.

Underemployment is a widespread and persistent feature of contemporary Australian labour markets, associated with adverse consequences such as low personal income, low life satisfaction, poor skills enhancement and low family income (Watson 2008; Wilkins 2007), yet there has been little research examining its impact on housing. Given the robust literature that points to the adverse impact of unemployment, or joblessness in general, on housing security (Berry et al. 2010; Böheim & Taylor 2000; Horsewood & Doling 2004), there is a strong *prima facie* case that underemployment might also have adverse consequences for housing security. This in turn has implications for the design of policy aimed at easing pressures that lead to housing insecurity.

This research project aims to provide an Australia-wide analysis of the consequences of underemployment for housing security. An earlier AHURI Positioning Paper (Campbell et al. 2013) details the rationale for the project, addresses important conceptual issues and reviews the academic and policy literature. This Final Report presents the empirical findings. It aims to deepen our knowledge of underemployment and its relationship to housing insecurity by answering the following research questions:

1. What is the level and trend for underemployment?
2. What are the main characteristics of underemployed individuals?
3. Is underemployment for individuals correlated with other dimensions of labour insecurity?
4. What is the pattern of persistence in underemployment? Are underemployment 'spells' typically short-lived or more persistent?
5. What are the main characteristics of underemployed households?
6. Do underemployed households have a higher incidence of housing insecurity compared with other household types? How does this vary with tenure?
   → Is the incidence of housing payment arrears and risk higher among underemployed households compared with other household employment types?
   → To what extent do underemployed households, compared with other household types, encounter difficulties with paying other bills?
   → To what extent do underemployed households, compared with other household types, use income-supplementing strategies?
   → Has housing affordability for underemployed households declined over time compared with other household types?
7. Do correlations between underemployment and housing insecurity outcomes still hold after controlling for other individual and household attributes?
8. Does the persistence of underemployment increase the odds of housing insecurity?
9. What might be the policy implications of the answers to the previous questions?
10. What might be the implications for further research?

To answer these questions we draw on the first nine (2001–2009) waves of the Household Income and Labour Dynamics in Australia (HILDA) Survey. We analyse the HILDA data, using

both descriptive techniques and logistic regression modelling. Our sample design comprises *those individuals within households* who we consider to be responsible for meeting rents and housing payments. Using a conventional labour force framework for disaggregating the working-age population, we distinguish the underemployed, defined as persons employed part-time, that is less than 35 hours per week, who state a preference for more hours of paid work, from four other labour status groups—the full-time employed, adequately employed part-timers, the unemployed and persons not in the labour force (NLF). Building on this labour force framework, we also develop a typology that distinguishes different *household types*. The key categories are two underemployed household types, distinguished according to whether underemployment is present in either single-earner or multiple-earner households. Comparison categories include single- and multiple-earner households in which all workers are employed, either full-time or part-time, but none fall into the category of underemployment. These household types are described as *adequately employed*. Other comparison categories include two household types with unemployment present, which can be grouped with the two underemployed household types as *inadequately employed*, and one household type with all adults not in the labour force.

To operationalise the concept of housing insecurity we use two measures—*housing payment arrears* and *housing payment risk*. Housing payment arrears is derived from the HILDA financial stress indicator: 'could not pay the mortgage or rent on time' in a recent period because of a shortage of money. This measure is indicative of a cash flow problem that could be either one-off or more enduring. Housing payment risk is a variation on the typical housing stress measure and flags individuals and households as 'at risk' if they satisfy all of the following three conditions:

→ Paying over 30 per cent of equivalised disposable income on rental or mortgage costs.

→ Extreme difficulty in raising $2000 ($3000) at a time of need.

→ Self-rated prosperity as 'just getting along', 'poor' or 'very poor'.

Key findings: individual characteristics of underemployed workers

Our descriptive findings for individuals corroborate those of earlier studies (Baum & Mitchell 2008; Campbell et al. 2013; Watson et al. 2003; Wilkins 2004, 2006, 2007). The data confirm that underemployment is widespread and is in fact more common than unemployment. They reveal that underemployment affects groups of workers unequally—for example, women, younger age groups and the unskilled tend to be over-represented among the underemployed compared with other groups. Moreover, the experience of underemployment persists for some workers, particularly those in less-skilled positions. Around a third of underemployed workers in any one year remain underemployed one year later.

Underemployment is thought to be of relevance to housing outcomes because it is a cause of low income, but our findings suggest a second, perhaps equally important, reason—underemployment is correlated with insecure employment, especially casual contracts. As a result, incomes can be both low and volatile, as underemployed workers endure irregular schedules and intermittent employment in casual and temporary jobs. They therefore are likely to experience difficulties meeting fixed commitments such as rent and mortgage payments. Young people are over-represented among the underemployed, but we nevertheless find that close to three-quarters of the underemployed are independent adults with responsibility for meeting housing costs. These 'responsible adults' are more likely to be purchasers and private renters than to be outright owners.

Key findings: underemployed households

Our descriptive findings for households underline the significance of the two types of underemployed households and reveal their main characteristics. We find that 3 per cent of all responsible adults live in an underemployed single-earner household while a further 6 per cent

live in an underemployed multiple-earner household. Our descriptive analysis suggests that underemployed single-earner households differ in crucial respects from underemployed multiple-earner households.

Underemployed single-earner households:

→ Are typically composed of lone persons (48%) or lone parents with dependent children (23%), with only a quarter made up of couple or group households.

→ Are typically composed of women (62%).

→ Typically rely on income from casual employment.

→ Are concentrated (48%) in the private rental market.

In contrast, underemployed multiple-earner households:

→ Are typically composed of couples with dependent children (47%) and couples without dependent children (34%).

→ Tend to live in housing that is being purchased (47.8%).

Key findings: descriptive analysis of renter and purchaser insecurity

On cross-tabulating underemployment and our two indicators of housing insecurity we find that the incidence of housing payment arrears and housing payment risk is higher among underemployed households compared with adequately employed household types. The analysis suggests particular problems for underemployed households in meeting housing payments in the private rental sector. Similarly, underemployed households are more likely than their adequately employed counterparts to experience hardship meeting utility bills and to have difficulty saving.

Trends in housing affordability over the period 2001 to 2009 reveal a relative deterioration in affordability among underemployed households compared with the adequately employed.

Key findings: modelling rental and purchaser insecurity

Using robust logistic regression modelling techniques for panel data, we find that the presence of underemployment in a household significantly increases the chances of housing insecurity, even when controlling for observed and unobserved personal characteristics. The strength of this relationship differs between renters and purchasers, as outlined below.

Rental payment arrears and risk

We find that underemployed households have the highest odds of rental payment arrears compared with all other household types. Underemployed single-earner households are especially vulnerable, with their odds of payment arrears nearly three times higher than a comparable adequately employed multiple-earning household. The higher odds of rental payment arrears among the underemployed may indicate problems of cash flow stemming from insecure earnings and delayed or limited access to income support.

It could be objected that the household employment typology provides only one perspective on household labour supply. To supplement and test this perspective, we also developed an hours-based labour deficiency measure, which is then interacted with the dichotomous variables representing household employment categories. We find that the patterns of association between underemployment and housing insecurity still persist.

On experimenting with lagged versions of household employment categories we discover that the chances of housing rental payment arrears in the current year are lifted if there has been an episode of underemployment in the previous year, which is symptomatic of scarring effects.

The odds of rental payment risk are also high for underemployed households. For example, the odds of rental payment risk are significantly elevated for underemployed single-earner

3

households), compared with adequately employed multiple earner households. These odds are only marginally below those for unemployed households without earners, despite this latter category having a more severe labour deficiency. In contrast to the data for payment arrears, modelling our measure of rental payment risk shows less evidence of scarring effects from underemployment.

Purchaser payment arrears and risk

Underemployment is again a significant factor for housing insecurity among purchasers. This is acutely so for the underemployed single-earner household, whose odds of mortgage arrears are more than four times those of an adequately employed multiple-earner household. In the case of the mortgage payment risk measure, the underemployed single-earner household is once more the most vulnerable compared with all other household employment types.

The mortgage arrears and mortgage payment risk models uncover little evidence of the scarring effects evident in the equivalent models estimated for a sample of renters. It could be that lenders extend mortgage forbearance to owners in arrears, while landlords, who are often 'mum and dad' investors, are less sympathetic to tenants with payment arrears, with the result that underemployment effects for renters endure beyond the concurrent year.

Other individual and household predictors

Our research suggests that personal characteristics can be important factors that leave renters and purchasers vulnerable to housing insecurity. Those with a health condition, dependent children, an acute housing cost burden, single (particularly lone parents) and no post-school qualifications, all have significantly increased odds of payment arrears and payment risk. Young tenants under 35 years of age are most prone to rental arrears, but mortgage arrears peak among older purchasers in the 45–54 years age band. Owners are particularly prone to mortgage arrears and payment risk if they have a small equity stake in their homes and have volatile incomes.

Policy implications

The research findings confirm a statistically significant and strong association between underemployment and housing insecurity. The presence of other earners in the household cushions but does not reverse the higher incidence of housing insecurity among underemployed households. The rationale and precise site of any policy responses must depend on where we situate the threshold or 'tipping point' for concern. This in turn depends on an ability to assess both the intensity and persistence of underemployment. Any policy interventions or assistance are most appropriately targeted at individuals and households where underemployment is severe and sustained (or recurrent). Our research makes a start in assessing both aspects, for example by noting the probability of transition out of underemployment into other labour statuses between consecutive HILDA waves (see Table 18), but we caution that more research needs to be done.

In principle, policy responses to the housing security consequences of underemployment can be located on either the employment or the housing side of policy. Many of the recommendations from the Inquiry into Insecure Work, if implemented, would have flow-on effects that could improve the housing market prospects of households affected by underemployment. Recommendations include a set of minimum employment standards for all workers as well as wide-ranging welfare reforms to increase personal income protection. The most significant proposal for personal income protection is a national employment insurance scheme (Howe et al. 2012).

Households affected by underemployment are prone to housing insecurity in private rental markets despite housing subsidies designed to alleviate housing affordability. The efficiency and equity of Commonwealth Rent Assistance (CRA) needs to be reviewed. It does not seem to respond to the housing cost burdens of underemployed workers because receipt of an

income support payment is an eligibility criterion for CRA. Many underemployed workers, especially those in single-earner households, will therefore fall through the housing assistance net. Introducing a separate income means test for CRA is a relevant reform option, if this can be joined with targeting conditions to ensure that it is the underemployed who benefit. Improving the supply of low-cost housing should help alleviate housing insecurity among the underemployed.

The empirical results confirm the important role that social housing plays in reducing insecurity among those with inadequate and uncertain earnings. The high rate of rent arrears in the private rental market among those with inadequate hours of work is a warning sign that shrinking social housing opportunities could prove troublesome. State government rental payment and home purchase assistance programs provide time-limited support to some households. However, the implementation of these programs lacks a cohesive approach across state jurisdictions. There is need for a comprehensive review of these assistance programs, alongside the federally-funded CRA and first home owner grant programs, with the aim of developing a better integrated suite of housing policies that can address the housing affordability needs of all low-income households, including those affected by the presence of underemployed workers.

Directions for future research

Our Final Report is a novel contribution to labour and housing market research, as it represents one of the first studies to link underemployment and housing difficulties. The program of research would benefit if its scope were broadened to include groups such as underemployed non-dependent children and discouraged workers who have withdrawn from the labour force but would welcome employment opportunities.

Structural changes in labour markets as a result of deregulation, globalisation, technical change and shrinking trade union influence form the important background of our research. Some analysts associate these changes with growth in insecure jobs and increases in the number of workers who churn between short-lived jobs that offer few opportunities to augment human capital and hence career advancement. This is an area which receives considerable attention from researchers in labour studies; nevertheless, we know little about the housing consequences of these profound and possibly enduring changes in labour markets. This is an important area for further investigation.

A caveat concerning the empirical work is the direction of causation between housing insecurity and underemployment. The regression models have been specified assuming that housing insecurity can result when a household is affected by underemployment. It is conceivable that housing insecurity motivates a search for additional hours of employment that is not always successful. The use of more sophisticated statistical methods could help resolve this conundrum. In addition, in-depth qualitative research examining what happens to households during a period of underemployment, including how they seek to resolve their housing difficulties, would greatly add to our understanding of the ways underemployment may differ or align with the experience of unemployment. A critical component of this type of inquiry would be to examine the factors shaping a household's need and decision to work more hours, including the role that housing cost burdens may play in the collective labour supply of household members.

1 RESEARCH QUESTIONS, DATA SOURCES, CONCEPTS AND METHODS

The AHURI Positioning Paper (Campbell et al. 2013) introduces our research project and presents the rationale for examining the connection between time-related *underemployment*, an increasingly important but problematic feature of contemporary labour markets, and *housing insecurity*, a crucial dimension of housing research and policy. The Positioning Paper goes on to introduce key concepts, summarise descriptive data on underemployment and unemployment, primarily from the Australian Bureau of Statistics (ABS) and to sketch out possible research questions and a research strategy. This Final Report is largely confined to presenting the empirical results of our quantitative analysis of underemployment and housing insecurity and to reflecting on the implications of these results for labour market and housing policy and research.

Before moving to the empirical results, we need first to outline the conceptual framework and methods. This chapter summarises our main research questions and then introduces the data sources, the measures of key concepts such as underemployment and housing insecurity, and the statistical methods used for answering our research questions. In effect it provides the technical starting point for the empirical analyses in the following chapters.

1.1 Research questions

A background review of the discussion on underemployment and housing insecurity, summarised in the Positioning Paper (Campbell et al. 2013), established that underemployment is widely recognised as a significant problem in Australia, linked to the more familiar issue of unemployment as a second dimension of what is called 'labour underutilisation'. We know that the incidence of underemployment has increased rapidly in the past twenty years (Campbell 2008), reaching a point where the rate of underemployment is consistently higher than the rate of unemployment (ABS 2011). Moreover, we know that underemployment has adverse consequences for individual underemployed persons, such as low-income and low life satisfaction (Wilkins 2007). Similarly, it is associated with poor skills enhancement (Watson 2008, p.15), thereby suggesting that the consequences readily spill over from the individual to the workplace. Low personal income is linked with low family income (Wilkins 2007), but research has not so far pushed on to the likely consequences for households and the impact on issues such as housing insecurity. Given the robust literature that points to the adverse impact of unemployment, or joblessness in general, on housing insecurity (Berry et al. 2010; Böheim & Taylor 2000; Horsewood & Doling 2004), there is a strong *prima facie* case that underemployment is also likely to have an adverse effect on housing insecurity. This in turn has implications for the design of policy aimed at easing pressures on housing insecurity. The Positioning Paper concludes, from the point of view of both research and policy, that the relationship between underemployment and housing insecurity in Australia needs to be examined more closely.

The background review in the Positioning Paper led to the formulation of several research questions, which we used to guide both the analysis and then the discussion in this Final Report:

1. What is the level and trend for underemployment?

2. What are the main characteristics of underemployed individuals?

3. Is underemployment for individuals correlated with other dimensions of labour insecurity?

4. What is the pattern of persistence in underemployment? Are underemployment 'spells' typically short-lived or more persistent?

5. What are the main characteristics of underemployed households?

6. Do underemployed households have a higher incidence of housing insecurity compared with other household types? How does this vary with tenure?

  → Is the incidence of housing payment arrears and risk higher among underemployed households compared with other household employment types?

  → To what extent do underemployed households, compared with other household types, encounter difficulties with paying other bills?

  → To what extent do underemployed households, compared with other household types, use income-supplementing strategies?

  → Has housing affordability for underemployed households declined over time compared with other household types?

7. Do correlations between underemployment and housing insecurity outcomes still hold after controlling for other individual and household attributes?

8. Does the persistence of underemployment increase the odds of housing insecurity?

9. What might be the policy implications of the answers to the previous questions?

10. What might be the implications for further research?

These research questions fall into three main groups. The first five research questions are aimed at deepening our knowledge of underemployment, in particular as it relates to households and persons responsible for housing payments. The next three questions take up the central challenge of our research project—to examine the connection between underemployment and housing insecurity. The last two questions explore the implications of the research results.

1.2   Data sources

ABS data are useful for tackling some of these research questions. In the Positioning Paper we use such ABS data to present basic information both on the level and trends of underemployment and unemployment and on basic characteristics of the group of underemployed persons (Campbell et al. 2013, pp.22–35). However, ABS data sources are of limited assistance for most of our research questions, since these data are predominantly cross-sectional rather than longitudinal and lack both household measures of underemployment and measures of housing outcomes. Instead most of these research questions require access to a different data source.

Our primary data source for the empirical analysis in this Final Report is the first nine waves (2001–2009) of the Household, Income and Labour Dynamics in Australia (HILDA) survey. In using HILDA data, we follow in the footsteps of several scholars who explore the phenomenon of underemployment (Baum & Mitchell 2008; Li et al. 2013; Watson et al. 2003; Wilkins 2004, 2006, 2007; Wooden & Drago 2009). HILDA is a nation-wide household panel survey, based on a large national probability sample of Australian households occupying private dwellings. Individual interviews are conducted with eligible members of the household, broadly understood as persons aged 15 and over, who are described as 'responding individuals'. At the same time, household information encompasses not only these responding individuals but also persons aged under 15, with the two groups together described as 'enumerated individuals'. The households and the individuals within them are followed at annual intervals, though the number of responding individuals and households in each wave can vary due to attrition, the use of top-up samples, and changes in household composition (household splits, household joiners). At each annual interview, individuals can also use a calendar to record information on their work and study activities from 1 July in the previous year. In 2001, there were 13 969 individuals responding from 7682 households. By 2009, there were 13 305 responding individuals from 7234 households (see MIAESR 2011, pp.12–19 for more detailed discussion on the representativeness of the survey over time).

We use data both from each annual wave and from pooled samples formed by combining the nine waves. Data for individual waves are used to present changes in key dimensions over time, while the pooled samples are used for the descriptive and modelling analysis that explores the relationship between labour force status and housing insecurity. The pooled data represent an unbalanced panel sample from 2001–2009. An unbalanced panel means that some individuals have missing observations in one or more waves but are retained in the panel. Discarding respondents that lack a complete set of records for 2001–2009 would result in an inefficient utilisation of the data source. In the following chapters we use three main pooled HILDA samples:

1. All individuals (of working age 15+).

2. Individuals (of working age 15+) considered primarily responsible for rent or mortgage payments.

3. Households.

We use weighted and unweighted data. The recommended weights, for individuals and for households, are employed when presenting data for each individual wave and to compute estimates for the total Australian population. In other cases, for example, with pooled data used for modelling purposes, the analysis is conducted with unweighted data. In the presentation of data in this report we signal when the data are weighted.

1.3   Conceptualisation and measurement

This section introduces the fundamental concepts and the corresponding measures used to guide our analysis. We start on the labour market side with five 'labour status groups' that we derive from the standard labour force framework. Underemployment appears here, together with full-time employment, adequate part-time employment, unemployment and not in the labour force (NLF) status as the central components of an amended labour force framework that forms the basis for all our empirical analyses. After introducing the framework, we discuss its application first at an individual level of measurement, where it is translated into headcount, volume and transition measures, and second at a household level of measurement. The discussion of the household measure, based on a new typology of households distinguished according to the labour force status of the adults responsible for housing costs, is followed by a discussion of our two main measures of housing insecurity.

1.3.1   The labour force framework

This research project starts from an amended version of the labour force framework—a set of concepts developed for use by national statistical bodies such as the ABS as a basis for classifying labour market activities and status (ABS 2007; Campbell et al. 2013, pp.18–19). The labour force framework has been influential for many decades, subject to continuous adjustment and improvement, primarily through the deliberations of the International Conference of Labour Statisticians (ICLS). In its initial form, the labour force framework divides the working-age population (aged 15+) into three main groups—employed, unemployed and not in the labour force (ABS 2007). More recent versions introduce additional distinctions, primarily in response to the widespread critique of the declining value of the concept of unemployment as a basis for measures of distinct labour market phenomena such as labour underutilisation (labour slack) in contemporary labour markets (ABS 2007; Campbell et al. 2013, pp.10–11; Watson 2000; Wilkins & Wooden 2011).

To strengthen the labour force framework as a basis for analysing contemporary labour markets, labour market researchers have introduced important new concepts and measures that can be added to unemployment in order to better capture labour underutilisation. The key concepts here are 'underemployment' and what was previously termed 'hidden unemployment' but is now renamed in the latest resolution of the ILCS as the 'potential labour force' (ILO 2013). We focus in this research project on underemployment. The concept of

underemployment is discussed in detail in the Positioning Paper, where we explain that it refers to time-related underemployment, broadly understood as employment that is insufficient in terms of the number of hours of paid work (Campbell et al. 2013, pp.9-11, 16–18, 67–70; see ILO 2013, p.9).

In response to the need for better measures of labour underutilisation, the ABS, over the past years, guided by Recommendations of the ICLS (see ABS 2007), has developed a suite of measures, both headcount and volume measures, that reach beyond the unemployment rate in order to offer broader measures of labour underutilisation. For example, the ABS *headcount (or person-based)* measures start with the familiar unemployment rate, which counts unemployed persons expressed as a proportion of the labour force. Among the new headcount measures are the 'labour force underutilisation rate', which adds together counts of the unemployed and the underemployed expressed as a percentage of the labour force, and the 'extended labour force underutilisation rate', which adds together counts of the unemployed, the underemployed and two groups of people marginally attached to the labour force, expressed as a percentage of the labour force augmented by the two marginally attached populations. The ABS *volume (or hours-based) measures* start with a 'volume unemployment rate', based on the number of hours sought by unemployed people, expressed as a percentage of the potential hours that could be supplied by the labour force ('the sum of hours sought by unemployed people and additional hours preferred by underemployed people working part-time, and the hours usually worked by all employed people'—ABS 2009). To this has been added a 'volume underemployment rate', which refers to the additional hours of labour preferred by underemployed workers again expressed as a percentage of the potential hours that could be supplied by the labour force. This in turn leads to a 'volume labour force underutilisation rate', which takes the hours sought by unemployed people plus the additional hours preferred by underemployed people, once again expressed as a percentage of the potential hours that could be supplied by the labour force (see ABS 2007, 2009). The ABS has not, as yet, attempted to develop a volume measure that would include the potential labour force ('hidden unemployment').

In operationalising the concept of underemployment, the ABS uses at least three slightly different measures (Campbell et al. 2013, pp.67–70). In our empirical analyses, we use the simplest definition of the underemployed as those persons employed part-time who state a preference for more hours of paid work. Although this differs slightly from the more sophisticated definition used by the ABS in its Underemployed Workers survey (ABS 2007, 2012), we deploy it here because it is the definition best suited to analysis of HILDA data (Campbell et al. 2013, p.46; see also Wilkins 2007, p.252).

When incorporated into the labour force framework, this definition produces an amended version of the labour force framework, which begins by dividing the employed into three groups: the full-time employed, the adequately employed part-timers and the underemployed (the inadequately employed part-timers). In aggregate, the total working-age population is now divided into five groups: the full-time employed, the adequately employed part-timers, the underemployed, the unemployed and persons not in the labour force (NLF). We refer to these five as 'labour status groups',[1] distinguished according to their 'labour force status', and we use these five groups as a basis for much of our analysis, extending throughout the following chapters. With this framework, underemployment is usefully identified as a separate category, which can be regarded as inadequate employment and which can be compared to adequate employment (full-time employment and adequate part-time employment) on the one hand, and non-employment (unemployment and NLF status) on the other hand.

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[1] We prefer to use the term 'labour status group' rather than 'labour *force* status groups' because it is less cumbersome. In this Final Report 'labour status' is treated, as in several international documents (Eurostat 2011), as a synonym for labour force status.

It can be noted here that in developing our amended labour force framework we do not attempt to disaggregate the large group labelled as 'not in the labour force'. This is a heterogeneous category that includes a group of 'potential labour force' ('hidden unemployed') that could also be important for labour market and housing analysis. However, the precise definition and measurement of this group remains undeveloped. Our primary interest is in extending the conventional analysis of labour markets and housing insecurity to include the underemployed, but we acknowledge that future research may also need to reach out to include the 'potential labour force'.

1.3.2   Individual level of measurement

Labour force status is first and foremost a characteristic of individuals, and much analysis using labour market concepts and measures takes place at an individual level. Different measures can be developed at this individual level. A simple *headcount* measure is the most important, providing the starting point for the refinement of the labour force framework in all its versions. However, we also develop a *volume* measure, useful for discussion of underemployment and unemployment, and transition measures, useful for acquiring a longitudinal perspective on the employment participation of individuals in any labour status group.

Headcount

Translating our five-fold classification of labour status groups into HILDA measures is relatively straightforward. HILDA labour force questions and variables are largely aligned with ABS concepts, and it is possible to follow closely in ABS footsteps. We start with the HILDA population of responding individuals, which is confined to individuals aged 15 years and over. This corresponds to the conventional ABS understanding of the working-age population. It also corresponds to our first pooled sample—all individuals (of working age).

Within the working-age population, the employed can be defined as 'persons who, during the reference week worked for one hour or more for pay, profit, commission or payment in kind, in a job or business or on a farm … or worked for one hour or more without pay in a family business or on a farm …' (ABS 2007). The unemployed can be defined as 'persons who were not employed during the reference week and had actively looked for full-time or part-time work at any time in the four weeks up to the end of the reference week and were available for work in the reference week …' (ABS 2007). The remainder of the population aged 15 years and over is classified as not in the labour force (ABS 2007).

Our amended labour force framework disaggregates the employed into three groups. To reach this endpoint, we start with the familiar distinction between the full-time and part-time employed (though the definitions applied to the HILDA data are slightly simplified in comparison with the standard ABS measure). Drawing on a question that asks about the number of hours per week usually worked in all jobs, we define the full-time employed as persons who usually work 35 or more hours per week in all jobs. The part-time employed are defined as persons who usually work less than 35 hours per week in all jobs. We then divide these part-time employed into two groups, according to their answer to a HILDA working time preference question, which asks: 'If you could choose the number of hours you work each week, and taking into account how that would affect your income, would you prefer to work … fewer hours, about the same, or more hours?' The part-time workers who stated a preference for more hours are labelled as the 'underemployed', while the other group of part-time workers is labelled as 'adequate part-time'. We treat both this second group of part-time workers and the group of full-time workers as adequately employed, in contrast to both the underemployed and the unemployed.

Table 1 below presents a breakdown of our first pooled sample, all individuals (of working age), in terms of 'observations' by labour status. An observation applies to a single person in a particular wave of the HILDA panel dataset and is sometimes referred to as a person period. This table offers a broad understanding of the relative significance of each labour status group in the pooled sample that we use for most of our analyses in the following chapters. The most

important labour status group is employed full-time (43.1% of the total of 116 685 observations), followed by NLF status (32.8% of the total). We can see here that there were 7676 observations (6.6% of the total) of underemployment—substantially more than the observations of unemployment (4121) (3.5% of the total).

Table 1: Labour status groups, all individuals, HILDA 2001–2009

Labour status group	Observations	%
Employed full-time	50,302	43.1
Adequate part-time	16,312	14.0
Underemployed	7676	6.6
Unemployed	4121	3.5
NLF	38,246	32.8
Total observations	*116,685*	*100.0*

Source: HILDA release 9

Pooled samples from panel datasets are used in order to add power to the analysis of the relationships between variables. Though separate observations in the pooled sample cannot be equated with separate individual persons, since the same individuals are associated with several observations in a pooled sample, it is convenient to refer to individual observations as persons for ease of presentation of the results. We adopt this practice in the remainder of the Final Report.

Volume

As noted above, the ABS has developed a volume (or hours-based) measure, which captures the hours of labour force underutilisation associated with unemployment and underemployment. It is possible to develop similar measures from HILDA data, since HILDA asks about the preferred number of hours of both those employed and a large number of those not employed. For the employed, the question on their preferred number of hours is linked to the question on working time preferences that is reproduced above. For those not working but stating a desire to work, an initial question asks: 'Assuming work was available, what would be the lowest wage per hour, before any tax is taken out, that you would accept?', which is then followed up by a question: 'If you were offered a job paying [that many] dollars per hour, how many hours per week would you prefer to work in that job?'

As Wilkins (2004, pp.17ff) shows using Wave 1 of HILDA, there are several ways of constructing volume measures of labour force underutilisation. Our measure, which we call a 'labour hours deficit' measure, follows the main conventions used by the ABS in constructing their volume measure of labour force underutilisation. Following the ABS, we treat the underemployed and the unemployed as the only groups that suffer a labour hours deficit. For these groups a labour hours deficit measure is arrived at by calculating the difference between their current weekly hours worked in all jobs (zero for the unemployed) and their preferred weekly hours.[2] No maximum limit for preferred weekly hours is imposed, but those with excessively high stated hours (above 60 hours) that represent outlying cases are removed or truncated from the sample. Truncated values typically represent less than 1 per cent of the sample.

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[2] It should be noted that not all persons in these two groups specified the number of preferred hours. Omitted values are most likely to be problematic for the unemployed who typically have a high amount of reported deficiency per individual. There was a total of 179 missing values for the unemployed over nine waves, with the highest number (N=38) in wave 1. Such cases have been omitted from the continuous measure, making the aggregate deficiency counts only indicative of the total volume.

In this approach, both the full-time employed and those not in the labour force are assumed to be free of any labour hours deficit (irrespective of whether or not they express a desire to work more hours). Similarly the 'adequate part-time' group is regarded as free of any labour hours deficit. All three groups therefore have a labour hours deficit score that is set at zero.

Our measure follows the ABS conventions but it differs in two relatively minor ways. First, as noted above, we adopt the simplest definition of underemployed workers, as comprising part-time workers who state a preference for additional paid hours (cf ABS 2012). Second, we do not calculate our measure as a rate; instead we leave our measure expressed simply as a count of the potential additional (or deficit) hours associated with the working time preferences of the unemployed and the underemployed. Additional deficit hours are likely to signal more pressing spending demands that need to be met from additional sources of income, and hence growing vulnerability to housing insecurity. A rate measure, while suitable for the investigation of macro labour utilisation issues, is less suited to investigation of housing insecurity and its relationship with underemployment.

Table 2 below shows results for this volume measure. Although the headcount measure in Table 1 indicates that the number of underemployed 'observations' was higher than the number of unemployed 'observations', the volume measure in Table 2 indicates that the unemployed rather than the underemployed have a larger quantity of deficit hours. This corresponds with what we know from ABS data (Campbell et al. 2013, p.23).

Table 2: Labour status groups, labour hours deficit, all individuals, HILDA 2001–2009

Labour status group	Observations	Labour hours deficit ('000 hours)	Mean labour hours deficit per observation ('000 hours)
Employed full-time	50,302	0	0
Adequate part-time	16,312	0	0
Underemployed[a]	7,669	96,233	12.55
Unemployed[a]	3,936	115,350	29.31
NLF	38,246	0	0
Total	*116,465*		

[a] The number of preferred hours was not specified for some underemployed (n=7) and unemployed (n=185) persons.

Source: HILDA release 9

Transition measures

The value of the panel data offered by HILDA is that it allows measures of transition between labour force statuses over extended periods of time. Panel data over a lengthy period such as nine waves allow two basic kinds of measures of the incidence of underemployment (or other labour force status) over a segment of an individual's working career:

1. *Of persistence*, which would be the length of time spent continuously in one labour force status before transition to another status.

2. *Of recurrence (or churning)*, which would be the number of times an individual enters a particular labour market status over the entire course of the panel.

The length of time spent continuously in one labour market state is commonly referred to as a 'spell'. Measures of persistence and recurrence are then captured by estimates of the duration of spells and the number of spells.

Unfortunately, measurement of a 'spell' using HILDA data is not straightforward. We cannot take advantage of data from the HILDA employment and education calendar, since this does not include a measure of underemployment. Thus, we are confined to observations at the time of each annual interview. Our preferred approach is to examine both the duration and number of spells of underemployment in discrete time, following the method outlined by Cox (2007, pp.249–265). We define incidence both in terms of the number of spells and the length of each underemployment spell in discrete time. There are nine waves (years) of observations when including the first and last year of the panel. Each time an individual moves to a different employment state, the transition marks the end of one spell in (say) wave t and the start of a new spell in Wave t+1. With nine waves of the panel there can be no more than four spells of underemployment. We define the duration of underemployment as the length of time that a person remains underemployed before transitioning to a different employment state. The unit of measurement is a year; for example, if an individual reports being underemployed in Waves 1 and 2 and then moves into full-time employment in Wave 3, this first spell of underemployment has a duration of two years. These measures are constructed from observations of labour force status where adjacent observations are separated by an interval of one year. They will not capture some transitions over short intervals of less than one year, and this will affect our estimate of the number of spells of underemployment. If the incidence of short spells is uniform across the population the measurement error will not seriously affect comparisons across subgroups.

We can also examine persistence via a transition probability matrix from the pooled panel. The matrix examines the transitions *from* underemployment *to* other labour force statuses between consecutive waves of a pooled panel dataset. It provides an indication of the likelihood of remaining in underemployment or moving to a different labour force status in the following year of observation. In this analysis cases without two consecutive observations in the pooled sample are treated as missing.

1.3.3 Household level of measurement

Examination of the associations between labour market characteristics such as underemployment and housing outcomes raises difficult issues of measurement because it involves moving from an individual to a household level of measurement. Labour market participation is typically an individual activity, with wages received by the individual, not the household, but household members 'share the same roof' and pool sources of income to meet housing costs, the latter being a responsibility of the household. Even though individuals receive wages and households meet housing costs, the typical approach in much of the literature examining the relationship between work and housing has been to select just one member within a household who is considered to be the 'household head' or 'reference person'. Information on the employment conditions of this person is then linked with information on the housing conditions of the household (Henley 1998; Yates & Gabriel 2006). This approach rests on the traditional assumption that there is a key breadwinner in the household who has the main responsibility for providing and paying for housing. Many household surveys in the past have been based on this assumption, thus limiting the type of household measures that can be constructed. But in contemporary couple households it is common for both partners to be employed, and their earnings are pooled to meet the joint responsibility for paying rent or mortgages (and hence housing security). In a couple household, analysis of the relationship between underemployment and housing insecurity should therefore choose a sample design that includes both partners but excludes the children living with them, as the latter are in general not responsible for housing costs. In group households and multi-family households the traditional assumption of a key breadwinner is even more unrealistic, and different sampling rules from the conventional are again required.

As argued by Randolph (1991), there is no direct connection between an individual's labour force status and housing position because it is likely to be mediated by the type of household

that they live in. The labour force status of other responsible adults within the household can be highly influential in either mitigating or exacerbating housing outcomes such as housing insecurity. For example, in the case of an unemployed person, the extent of housing insecurity may be influenced by whether or not the household also includes one or more adequately employed adults. Similarly, housing tenure can be influential in mediating the effect of labour market insecurity on housing. To understand the relationship between labour, households and housing outcomes it is therefore critical to have a household measure of labour force status that can be meaningfully linked to household outcomes. A household measure that distinguishes different combinations of labour force statuses among all responsible adults can be useful in identifying vulnerable households.

To develop labour force measures that can be used at a household level of measurement, and can therefore be linked with housing characteristics, we proceed in three main steps, starting with the headcount measure of persons. First, we design a sample of individuals that can be considered responsible for housing costs. Second, we design a household typology that can capture the key differences in the composition of households in terms of labour force status, with a particular focus on underemployment. And third, we assign our sample of individuals to the household types identified in the typology.

Designing a sample of 'responsible adults'

A particular strength of the HILDA data set is that it allows us to identify the employment characteristics of all responding individuals in a household. HILDA is a household survey, where households are defined as a group of people who usually reside and eat together. Our sample frame will be those persons considered to be primarily responsible for ongoing rent or mortgage repayments as either a lease holder or owner of the property. This definition implies that dependent and non-dependent children should be excluded from the analysis. According to the ABS definition, a dependent child is understood to be a person under 15 or a dependent student (ABS 2005). A dependent student is:

> … aged 15 to 24, studying full-time, not working full-time and lives in a household with their parent (natural, step, foster or adopted). They do not have a partner or child of their own in the household (if they did, they would be classified as a couple or lone parent themselves). (Summerfield et al. 2012, p.44)

A non-dependent child is defined as:

> … a child who is at least 15 years of age living in a household with their parent (natural, step, foster or adopted) who does not fall into the category of a dependent student. They do not have a partner or child of their own in the household. (Summerfield et al. 2012, p.44)

Both dependent students and non-dependent children may have reached adulthood (there is no maximum age limit in the definition of non-dependent child—see above definition), but we assume that, like children under 15, they make no contribution to the housing costs of the household.

Our sample is then derived in the following way. We start with all households and persons in the HILDA sample frame for households ('enumerated individuals'). We then exclude three groups of persons from every household, using variables that identify each person's age and the family relationship between members of the same household. First, we exclude all persons aged less than 15 years in order to bring us back to the working-age population. Second, we exclude all dependent students. Finally, all non-dependent children are omitted. For example, in a couple household with two children, both partners of the couple are considered within the sample but the children are omitted, while for a group household of three unrelated adults with one child, the three unrelated adults are retained and the one child is omitted from the sample.

The selection rules form what is referred to in this Final Report as a sample of *responsible adults*, where 'responsible' means that they are presumed to be responsible for housing costs. This is our second main pooled sample, and we use it extensively in our analyses in the following chapters, in connection both with the five labour status groups outlined above (1.3.1) and with the seven household types outlined below (1.3.3).

Table 3 below shows the labour force status of this sample of responsible adults and two of the omitted groups—dependent students and non-dependent children. The responsible adults account for the vast majority (87%) of the total observations for the working-age population and the majority (70%) of the total observations of underemployment for the working-age population. Within the sample of responsible adults, as in the case of all individuals (see Table 1), underemployment (5.3% of the total) appears more significant than unemployment (2.7% of the total).

Table 3: Labour status groups, 'responsible adults' and children, HILDA 2001–2009

Labour status	Responsible adults		Non-dependent children		Dependent students	
	Observations	%	Observations	%	Observations	%
Employed full-time	45,949	45.3	4,352	60.3	1	0
Adequate part-time	13,201	13.0	517	7.2	2,594	32.9
Underemployed	5,410	5.3	845	11.7	1,421	18.0
Unemployed	2,786	2.7	606	8.4	729	9.2
	34,203	33.7	893	12.4	3,150	39.9
Total observations	*101,549*	*100*	*7,213*	*100*	*7,895*	*100*
% of total observations		87%		6%		7%
% of total underemployment		70%		11%		19%

Source: HILDA release 9

In short, the effect of eliminating dependent students and non-dependent children is relatively minor. Nevertheless, it is interesting to note that, according to Table 3, almost two-thirds (65%) of children 15 and over living with parents are employed.[3] Moreover, the proportion that is underemployed is in fact higher among dependent students (18%) and non-dependent children (11.7%) than among responsible adults (5.3%). The underemployment of dependent students and non-dependent children in the household may have consequences for housing that deserve study. However, we leave this group aside as a topic for investigation in later research. We are justified in excluding them from this study because those housing consequences are likely to be different in nature and extent. The housing circumstances of responsible adults are a more serious policy concern because children are typically accumulating human capital and have most of their labour market careers ahead of them, while adults have generally finished making the most important investments in human capital. They are then less able to recover from disadvantageous housing and labour market positions.

Designing a household typology

The second step in developing measures for use at a household level is to identify a parsimonious number of household types that can capture the different situations faced by

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[3] This could challenge the assumption concerning children and responsibility for payment of rent or mortgages. While employed but dependent children are unlikely to make a contribution to households' housing payments, the same claim is less credible with respect to non-dependent children with earnings.

'responsible adult' members of households when struggling to meet housing costs. This second step is carefully guided by the aims of the research. Our particular focus in this project is on the impact of underemployment among 'responsible adults', compared to other labour force statuses. In this sense, we are particularly interested both in identifying household types that reflect the presence of underemployment among 'responsible adult' members of households and then in comparing these household types with other household types. The literature suggests that one salient point in assessing the impact of underemployment at the household level will be whether an underemployed 'responsible adult' is the only earner in the household or whether the underemployed 'responsible adult' is in a household with other (adequately employed) earners. In the former case, we would expect the impact of underemployment on housing outcomes to be direct and severe, whereas in the latter case we would expect the impact to be more mediated and less severe. Thus, we aim to distinguish two household types that involve the presence of underemployment—one for a single-earning household and the other for a multiple-earning household. We then aim to compare these household types with other household types distinguished according to the labour force status of the 'responsible adult' members of the households.

Consistent with the aims of the research, we have developed a simple household typology as a framework for our empirical analysis in the following chapters of underemployment and housing insecurity. This typology identifies several/seven mutually exclusive household types.

In effect we use two criteria in order to generate this typology. We start by distinguishing households according to the number of *earners*, that is the number of employed, among the 'responsible adult' members of the household. This produces three basic categories:

1. Multiple-earning households, which contain two or more (>1) employed 'responsible adults'

2. Single-earning households, which include only one employed 'responsible adult'

3. Zero-earning households, which contain zero employed 'responsible adults'.[4]

The second criterion relates directly to our five labour force statuses. We can differentiate our three basic categories of households (multiple-earning, single-earning and zero-earning) by looking beyond the mere fact of employment to a more precise definition of the labour force status of the 'responsible adults' within the households. We are particularly interested in identifying the presence of underemployment and unemployment. As noted above, our focus in this research is on the underemployed. We therefore give this labour force status priority in our schema and we begin by singling out household types that contain *underemployed* 'responsible adults'. They can be found in multiple-earning households, where at least one responsible adult member is underemployed, or in single-earning households, where that single earner is underemployed, but they cannot by definition be in zero-earning households. We can therefore identify two household types that involve the presence of underemployment, with the first defined simply as a multiple-earning household in which at least one of the earners in that household is underemployed, and the second defined as a single-earning household in which that single-earner is underemployed. We can call these two, at least for the moment, 'multiple-earning underemployed households' and 'single-earning underemployed households' respectively. These two household types will include all the underemployed responsible adults in our sample (see Table 6 in the next sub-section).

Next we pay attention to the impact of *unemployment* within households. This is the pivot for one side of our comparison of underemployment, and it is important to develop household types that clearly reflect the presence of this labour force status. It is true that some unemployed could be included in the two household types already distinguished above, that is

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[4] It should be stressed that the criterion here involves a count of individual persons, but it is *not* a count of all persons in the household, nor is it even a count of all 'responsible adult' members of the household. Instead it is a count of the number of earners among the 'responsible adult' members of the household.

the 'multiple-earning underemployed households' and the 'single-earning underemployed households'. However, subsequent analysis indicates that the numbers are tiny compared to the underemployed within those households (see Table 6). Most unemployed responsible adults are found in other households. For example, the majority can be found in a zero-earning household, where that person is either living alone or living with other persons who are jobless (see Table 6). We can call these 'zero-earning unemployed' households. Alternatively, some unemployed can be found living together with employed persons in either multiple-earning or single-earning households. We could call households of these types, where there is no underemployment but there is at least an element of unemployment, 'multiple-earning unemployed households' and 'single-earning unemployed households'.

So far we have identified five household types, made up of households with at least one responsible adult subject to either underemployment or unemployment. A further three household types can be distinguished by incorporating into the typology the remaining households within each of the three basic categories listed above, that is multiple-earning, single-earning and zero-earning categories. These will be households without any responsible adult who is subject to either underemployment or unemployment. In the multiple-earning group the remaining households will be those where all the earners in these households are adequately employed (either full-time or part-time) and they do not live with any additional responsible adults who are unemployed. We can call this a 'multiple-earning adequately employed' household type. Similarly, in the single-earning group, the remaining households will be those where the single earner is adequately employed (either full-time or part-time) and s/he does not live with any additional responsible adult who is unemployed. We can call this a 'single-earning adequately employed' household type. In the zero-earning group, the remaining households will be those where the responsible adult or adults are not in the labour force (NLF) rather than unemployed. This can be called a 'zero-earning NLF' household type.

This approach generates eight mutually exclusive household types. It successfully captures a range of household types that are in different labour market circumstances and that could be expected to have a different relationship to housing security. They range from households that appear advantaged in terms of employment to households that appear disadvantaged—from *multiple earning adequately employed households* through to *zero-earning unemployed households*. Most important, this approach allows us to separate out two household types influenced by underemployment, and it thereby provides the platform for empirical analyses that can link these household types with housing outcomes and can compare their situation with the situation of other household types, in particular household types influenced by unemployment and household types dominated by adequate employment.

The eight types are presented in Figure 1 below. In sum, the eight household types, together with their summary definitions, are:

1. Multiple-earning adequately employed (two or more responsible adults are employed, no underemployed, no unemployed, all earners are adequately employed).

2. Multiple-earning underemployed (two or more responsible adults are employed, at least one earner is underemployed).

3. Multiple-earning unemployed (two or more responsible adults are employed, no underemployed, at least one responsible adult member of the household is unemployed).

4. Single-earning adequately employed (one responsible adult is employed, no underemployed, no unemployed, the single earner is adequately employed).

5. Single-earning underemployed (one responsible adult is employed, the single earner is underemployed).

6. Single-earning unemployed (one responsible adult is employed, no underemployed, at least one responsible adult member of the household is unemployed).

7. Zero-earning NLF (no responsible adult is employed, no unemployed, all responsible adult members of the household are NLF).

8. Zero-earning unemployed (no responsible adult is employed, at least one responsible adult member of the household is unemployed).

These household types can be grouped together according to the adequacy or inadequacy of employment in the household. In Figure 1 the adequately employed household types are coloured green, while the inadequately employed household types are coloured red. The final household type, the zero-earning NLF household type, falls outside this classification and has been coloured yellow.

Figure 1: Household typology

Number of earners among the 'responsible adult' members of the household ⟶

Two or more   One   Zero

Is underemployment or unemployment present?

1	2	3	4	5	6	7	8
Multiple-earning adequately employed	Multiple-earning underemployed	Multiple-earning unemployed	Single-earning adequately employed	Single-earning Underemployed	Single-earning unemployed	Zero-earning NLF	Zero-earning unemployed

The typology developed here is theoretically derived, guided by our need for a household measure that would allow an empirical analysis of the link between underemployment and housing insecurity. The distribution of responsible adults among these household types is more fully discussed in the next section. However, it is necessary to note here that in examining the numbers in our types, we found that the number of responsible adults in type 3 (multiple-earning unemployed) was only tiny. To provide a more solid category for analytical comparisons we decided to combine type 3 with type 6 (single-earning unemployed). This makes little difference theoretically, but it has practical advantages both in reducing the number of household types distinguished by the presence of unemployment from three to two and in facilitating empirical analysis. The resulting combined type can be defined as involving one or more earners in the household, no underemployment, and at least one responsible adult member who is unemployed.

This small amendment to the typology reduces the number of household types from eight to seven. Since our primary interest is in the labour force status dimension of the typology, we also decided to amend the titles of the household types, reversing the titles somewhat in order to bring the issue of labour force status to the fore and to shift the issue of the number of earners in the household to the back of the titles. This does not affect the definition of each type. Consistent with this approach to titles, the new type that is constructed from combining types 3 and 6 is called an 'unemployed with earners' household type. The list below, somewhat reorganised, presents the new titles (at the same time indicating in brackets the number given to the equivalent household types from the list above and from Figure 1):

→ adequately employed multiple earners (1)

→ adequately employed single earners (4)

→ underemployed multiple earners (2)

→ underemployed single earners (5)

→ unemployed with earner(s) (3 + 6)

→ unemployed without earners (8)

→ all not in the labour force (7).

These seven household types constitute a central part of the conceptual framework for the empirical analyses in the following chapters. The seven types can be loosely grouped together. The first two are *the adequately employed* households. The next four types can be seen as *inadequately employed* in one form or another. Two of these four types involve underemployed members, and there are also two types that reflect the influence of unemployment. The final type has no-one employed and no-one unemployed.

Assigning individuals to households

The third step is to assign individuals to households. In effect, we follow the attribution approach whereby persons are linked with household measures (Duncan & Hill 1985; Campbell et al. 2013, p.54).

The aggregate result is shown in Table 4 below, which indicates the relative importance of each of our household types. Of the total number of HILDA observations for responsible adults, we can see that the majority (35.3% and 26.6%) are in adequately employed households. The two underemployed household types contain a total of 9.1 per cent (6.3% and 2.8%), while the two underemployed household types account for 4.2 per cent (2.0% and 2.2%). The final household type, in which all responsible adult members are not in the labour force, is also a large group accounting for 24.8 per cent of the total sample of responsible adults.

The figures in this table suggest that the majority of adults meeting housing costs (62%) are found within adequately employed household types, either multiple-earning or single-earning. A

third major group is made up of responsible adults residing in households where all residents are not in the labour force. Separate estimates indicate that the majority (62%) of responsible adults in this last group of households are aged 65 years or over and retired. However, this still leaves 9.1 per cent, or nearly 1 in 10 persons responsible for paying housing costs, in households 'touched' by underemployment, while the equivalent calculation for unemployment is 4.2 per cent. Once again, we see that the lives of more people are directly impacted in this respect by underemployment than by unemployment.

Table 4: Household types, 'responsible adult' members of households, HILDA 2001–2009

	N	%
Adequately employed multiple-earners	33,659	35.3
Adequately employed single earners	25,308	26.6
Underemployed multiple-earners	6,010	6.3
Underemployed single earners	2,683	2.8
Unemployed with earners	1,901	2.0
Unemployed without earners	2,094	2.2
All not in the labour force	23,604	24.8
Total	*95,259[a]*	*100*

a. The household employment groups are derived from fully responding households to enable complete measures of household employment to be obtained. N=7,110 observations have been omitted from the final sample.

Source: HILDA release 9

Another way of assessing the relative importance of the seven household types is to examine the distribution of households rather than responsible adults across each of the different household types (Table 5 below). Though the total count is smaller, the profile is similar. Thus the majority of households (59%) can be regarded as adequately employed households. The two household types with underemployment present account for 8.3 per cent of all households, more than double the proportion (4%) of households affected by unemployment.

Table 5: Household types, households, HILDA 2001–2009

	N	%
Adequately employed multiple earners	16,477	28.0
Adequately employed single earners	18,205	31.0
Underemployed multiple earners	2,831	4.8
Underemployed single earners	2,033	3.5
Unemployed with earners	858	1.5
Unemployed without earners	1,461	2.5
All not in the labour force	16,878	28.7
Total	*58,763*	*100.0*

Source: HILDA Release 9

A more complete picture, supplementary to Table 4, of the distribution of responsible adults among our seven household types is presented in Table 6 below, which differentiates the responsible adults according to their individual labour force status. The table shows the proportion of responsible adults by labour force status found in each household type. We can focus here just on the two underemployed household types. In the underemployed multiple earner household, underemployed persons represent just over half (50.2%) of all responsible

adults. Almost all the other adults in these households are either adequately employed full-time or adequately employed part-time.[5] But a different profile characterises the underemployed single-earner household; underemployed persons account for over three-quarters (75.6%) of all responsible adults, but in this case all other members are either not in the labour force (19.6%) or unemployed (4.8%). Underemployment is therefore likely to be a more serious problem when present in the single earner household category. According to the rules for construction of our typology, underemployed persons are found *only* in these two household types. We can deduce from the figures in Table 6 that the majority (59.8%) are found in the underemployed multiple earner household, while the remainder (40.2%) are found in the underemployed single earner household.

Table 6 also throws light on the two unemployed household types. We can see that 46.6 per cent of the responsible adults in the unemployed with earner type were unemployed, while the corresponding figure in the unemployed without earners type was 75.2 per cent. Again, we can deduce from the figures that one-third (33.8%) of all unemployed responsible adults were in the unemployed with earner household type, but the majority (60%) were in the unemployed without earner household type.

Table 6: Labour status groups by household type, 'responsible adult' members of households, HILDA 2001–2009 (% of each household type)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		Unemployed			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
Employed FT	74.8	58.3	40.6	0.0	42.8	0.0	0.0	45.3
Adequate PT	24.3	13.7	6.9	0.0	7.2	0.0	0.0	12.8
Underemployed	0.0	0.0	50.2	75.6	0.0	0.0	0.0	5.3
Unemployed	0.0	0.0	0.5	4.8	46.6	75.2	0.0	2.7
Not in the labour force	0.9	28.0	1.8	19.6	3.4	24.8	100.0	33.8
Total %	100	100	100	100	100	100	100	100
N[a]	*33,659*	*25,308*	*6,010*	*2,683*	*1,901*	*2,094*	*23,603*	*95,258*

a. The household employment groups are derived from fully responding households to enable complete measures of household employment to be obtained. The lack of full responses means that N=7,110 observations have been omitted from the final sample.

Source: HILDA release 9

Using the typology

The typology is used as a framework to examine what impact underemployment has on housing insecurity given the presence or absence of other types of employment within the household. This is an important innovation because the analysis focuses on the employment

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[5] The number of unemployed found in underemployed households is small and we judge that it is unlikely to affect the results. Table 6 indicates that in underemployed multiple earner households the number of unemployed responsible adults is tiny (one unemployed for every 100 or so underemployed). In underemployed single earner households the number is larger but still small (six or so unemployed for every 100 underemployed).

structure within the household instead of an individual's employment circumstances; it is surely the household's (not an individual's) supply of labour that is critical to an understanding of a household's exposure to housing insecurity.

In the chapters below we use the typology mainly with our sample of responsible adults, though occasionally with a sample of households. The measure in both cases is a household measure, but in the former case the unit of analysis is individuals ('responsible adult' members of households) while in the latter case the unit of analysis is households. In all cases we signal the unit of analysis in the titles of the tables or figures.

A volume measure

So far the discussion of the household level of measurement has been confined to discussion of headcount measures of underemployment. This is justifiable, since it is the main focus in the chapters below. However, on occasion we also use a volume measure of underemployment and unemployment, which draws on our measure of labour hours deficit at the individual level (see Section 1.3.2). The household measure of 'labour hours deficit' is derived in a simple and straightforward fashion, by summing the total labour hours deficit of each responsible adult member of the household.

1.3.4 Housing insecurity

Housing insecurity is multi-dimensional and arises when ongoing tenure in housing is threatened or when access to conventional housing is denied (Campbell et al. 2013, pp.13, 49–53). There can be many different reasons why households become insecure and/or ultimately lose their home. These include reasons that may be independent of or only weakly associated with labour force status, such as a landlord wanting to sell a property or threats to household wellbeing arising from family violence. However, housing insecurity, including payment arrears and an owner's inability to pay for structural repair problems, can also be linked to labour market events such as an inadequate and insecure income stream as a result of unemployment or underemployment. In our research project we focus on two broad dimensions of housing insecurity—housing payment arrears and housing payment risk. Both can be caused by the inadequate and irregular earnings commonly associated with underemployment.

Measure 1: housing payment arrears

Households unable to meet payments for housing (rents and mortgage payments) and utilities, such as water, gas and electricity, can find their housing circumstances endangered, as landlords may seek eviction orders, financial institutions can foreclose, and utility companies could disconnect the properties of those in arrears. Housing payment arrears are then a good indicator of threats to housing security. In the poverty and wellbeing literature they are often interpreted as signals of acute financial stress and are most commonly associated with unemployment or non-participation in the labour force (Bray 2001; Breunig & Cobb-Clark 2005). But the relationship between housing payment arrears and underemployment is a potentially critical gap in the literature, as unpredictable shifts in income can arise as a result of unexpected transitions into underemployment.

HILDA includes housing payment arrears in its list of financial stress indicators, elicited in response to the question: 'Since January [survey year], did any of the following happen to you because of a shortage of money:

1. sought financial help from friends or family

2. could not pay utilities on time

3. *could not pay the rent or mortgage on time*

4. went without meals

5. sought help from welfare/community organisations

6. pawned or sold a possession

7. unable to heat home.'

The above financial stress indicators have been combined in many ways (see Campbell et al. 2013, p.50). We combine them into three groupings. The first grouping, *housing payment arrears*, is our direct measure of housing insecurity (threats to continued residence in the home) and is based on item 3 above, 'could not pay the rent or mortgage on time'. It is a binary variable taking the value 1 if a housing payment has been missed, zero otherwise.

Only the first grouping is directly related to housing insecurity, but the other two refer to experiences that might be aggravated by or be an adjustment to housing insecurity, and we therefore include them to facilitate a richer analysis. The second clustering of the financial stress indicators refers to *other bill payment difficulties*, and it comprises three items: 'could not pay utilities on time' (item 2 above), 'went without meals' (item 4 above), and 'unable to heat the home' (item 7 above). This allows us to capture the possible trade-offs between rent, mortgage payments and other necessary household expenses. When households face income constraints, they juggle competing bills and housing payments, making trade-offs between spending needs that have an acute bearing on their wellbeing and responding to the creditors or companies that apply the greatest pressure (Duggan & Sharam 2004). It is likely that households manage this process differently depending on their tenure, and these differences can have important implications for housing insecurity. For instance, private renters, who typically have higher and less flexible rents compared with social renters, face a greater risk of not being able to meet housing costs when income is threatened or persistently low. Social renters in contrast have access to Centrepay, which allows rent to be directly debited from a bank account before it can be spent on other expenses. Furthermore, social housing providers set rents as a proportion of income, so rents will fall if income suddenly drops. There is less flexibility with respect to other bills. While private and social renters are prepared to forgo food and other spending needs to help meet rent payments, this is not sustainable in the long run, and so tenants will be forced to miss rent payments despite the threat of eviction. The failure to meet other bill payments can then be an important indicator of imminent housing insecurity.

Income-supplementing strategies is a third grouping and includes 'seeking financial help from friends and family' (item 1 above), 'seeking help from welfare/community organisations' (item 5 above), and 'pawning or selling a possession' (item 6 above). This grouping provides potentially valuable insights into how households make adjustments in response to or in anticipation of housing insecurity. Income-supplementing strategies could be used to avert housing arrears.

Measure 2: housing payment risk

We can extend the boundaries of the housing insecurity concept by adopting a housing payment risk approach to measuring insecurity. It is based on assessing households' capacity to meet housing payments rather than their record of keeping up with housing payments. Such a measure would seek to identify those households that have little scope to accommodate unexpected expenses or adverse events—two critical factors that have been found to be significant causes of involuntary housing moves occasioned by hardship (Berry et al. 2010; Parkinson 2010).

We therefore assign housing insecurity status to households that:

1. have high housing costs relative to their incomes

2. have little if any savings or other sources of finance to fall back on

3. belong to the less prosperous sections of the community. Households that meet all three criteria are regarded as 'housing insecure'.

The operational task is to find and use HILDA data suitable for measuring each of the three criteria. With respect to the first criterion, we can draw on the housing cost-to-income ratio measures scattered throughout the housing affordability literature (as reviewed in Burke et al. 2011). A standard approach defines housing as unaffordable if housing payments account for 30 per cent or more of household income. But a (say) $40 000 household income goes further if there are 'two rather than four mouths to feed'. A typical response to this objection uses an adjusted household income estimate, commonly referred to as 'equivalised income', which is arrived at by dividing household disposable income by the square root of the number of people in the household (Atkinson, Rainwater & Smeeding 1995). Disposable income is preferred to gross income because it is a better measure of capacity to pay. HILDA conveniently offers researchers an imputed disposable income variable (see Summerfield et al. 2012, pp.51–66 for definitions of the derived income variables). Following this logic, we select for our first criterion those households that pay above 30 per cent of their equivalised disposable income on rental or mortgage costs.

Our second criterion targets households with little if any savings or other sources of finance to fall back on. Information on household assets (e.g. bank deposits) is not available in all waves of HILDA data. However, one question posed in every wave asks the respondent to choose which of four categories might best describe the degree of difficulty (s)he would experience if required to raise $2000 ($3000 in wave 9 to account for inflation) in an emergency.[6] We can use the answers to this question as a measure of the savings or other sources of finance that a person can fall back on. We define those reporting that they would have to do something drastic to raise $2000 ($3000), or could not raise $2000 ($3000), as having little if any savings or other sources of finance to fall back on.

A household's budget could be severely stretched by high housing costs and have no savings to fall back on (because all wealth is accumulated in the home), but as a high-income household we would not regard their housing situation as warranting policy concern. Our third criterion is designed to address this issue. We experiment by using a self-reported assessment of prosperity which HILDA makes available on a six-point scale.[7] This captures levels of both income and savings and therefore seems closer to a measure of housing payment risk than the standard approach, which restricts insecure housing status to those households in the lowest 40 per cent of the household income distribution. We confine insecure housing status to those making an assessment in one of the three lowest categories on the HILDA scale: 'just getting along', 'poor', and 'very poor'. These three categories, in our assessment, indicate that households are stretched and have little room to accommodate unexpected expenses, placing their housing at risk.

This housing payment risk version of insecure housing status is once again a binary measure that takes the value 1 if the person belongs to a household that meets all three criteria, zero otherwise. The measure has the virtue of combining various sources of information that have a bearing on housing security. But because it uses two survey questions from the self-completion section of the HILDA survey, where response rates are lower, the measure will have more missing observations than one based on an income threshold. [8]

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[6] The four categories are: 1) could easily raise $2000/$3000; 2) could raise $2000/$3000 but it would involve some sacrifices; 3) would have to do something drastic to raise $2000/$3000; and 4) couldn't raise $2000/$3000.

[7] The six categories are: 1) prosperous; 2) very comfortable; 3) reasonably comfortable; 4) just getting along; 5) poor; and 6) very poor.

[8] The self-assessed rating of prosperity has N=86 493 valid responses for our sample of responsible adults. Difficulty raising $2000/$3000 at a time of financial need has N=84 869 valid responses. We can note here that our other measure of housing insecurity is also subject to missing values. For example, there are N=84 869 valid responses for the sample of responsible adults for the financial stress measures of could not pay the rent or mortgage on time.

1.4   Data modelling method

Building on the findings of the descriptive analysis, we model whether, after controlling for other individual and household characteristics, there is a statistical association between labour force status and our two measures of housing insecurity. The approach features the use of longitudinal data and the application of panel modelling techniques. Until recently most quantitative research typically employed cross-sectional datasets; that is, observations on a sample of individuals, households or firms at a point in time. But there are now a growing number of longitudinal datasets that survey a panel of subjects over time. HILDA is one of the best Australian examples.

With cross-sectional datasets, researchers typically test hypotheses by constructing some measure of the phenomenon that they wish to study (e.g. housing security), and then relating it to a measure of the factor (e.g. employment security) that they believe helps determine a person's housing security. Correlations, if detected, can be called between person effects. There are a range of influences that help shape housing security; typically researchers will estimate multiple regressions models that include control variables for these other influences (e.g. sex, household type and so on). Not all influences can be measured and included in the model; familiar problems arise when omitted variables (say neighbourhood characteristics) are correlated with the key variable of interest (e.g. employment status). We risk incorrectly attributing the effect of other unmeasured variables to the key variable of interest.

Longitudinal datasets offer researchers opportunities that are not available when using cross-sectional datasets. Consider a sample of individuals with a complete set of yearly observations on housing security and labour force status between 2001 and 2010; we then have 10 observations on both variables for each person in the dataset (commonly referred to as a balanced panel). Any one individual could have years of adequate employment interspersed by periods of underemployment and/or unemployment. These variations in labour force status for the same individual can be exploited to study associations with housing security (within person effects). Note that some other personal characteristics relevant to housing security, ethnicity and sex for example, remain the same from year to year and cannot therefore mask identification of these within person effects. This is a significant strength of panel data sets.

But how do we measure these within and between person effects? One approach might be to 'stack' all observations treating each as if they are a random sample drawn from a population of individuals each of whom has one observation, and estimate a multiple regression model. But this would be seriously flawed, as its assumptions are clearly violated—observations that belong to the same individual are not independent—and estimated effects of right-hand side variables in the regression will be a mix of between and within person effects, with the former reflecting likely bias due to the omitted variable problem noted above.

There are two commonly invoked approaches to address the omitted variable problem using data with repeated observations—random effects and fixed effects models (Allison 2009; Rabe-Hesketh & Skrondal 2008). Our modelling of housing insecurity uses both of these panel techniques, the specifics of which are outlined in Chapter 4.

1.5   Summary

This chapter provides the platform for the presentation in the following chapters of our empirical results concerning the link between underemployment and housing insecurity.

The discussion in the following chapters is structured in terms of the 10 research questions that were introduced at the beginning of this chapter. The first five research questions are tackled in Chapter 2, which provides a descriptive profile of underemployed persons and households, paying special attention to characteristics that may be relevant to housing insecurity. Housing insecurity is directly considered in Chapter 3, which examines our key question concerning underemployed households and the incidence of housing insecurity. The descriptive

associations demonstrated in this chapter are then extended through modelling in Chapter 4, which explores research questions 7 and 8. The final two questions, which concern the policy and research implications of our results, are answered in Chapter 5.

2 A DESCRIPTIVE PROFILE OF UNDEREMPLOYED PERSONS AND HOUSEHOLDS

This chapter begins the task of presenting our empirical results. It offers a descriptive profile of the main features of underemployment, using data from the HILDA survey and focusing on characteristics that may be associated with housing insecurity, such as low income and concentration in vulnerable forms of housing tenure such as private rental. As foreshadowed in the previous chapter, we are interested in situating underemployment, both at the individual and the household level of measurement, in relation to adequate employment on the one hand and unemployment on the other hand. The descriptive profile in this chapter is necessary for deepening our understanding of underemployment and for drawing out insights as to why underemployed persons and households might be vulnerable to housing insecurity. It provides preliminary evidence of the association between underemployment and housing insecurity and also builds the bridge to the analysis in the next two chapters, where we directly examine the link between underemployment and housing insecurity, again using HILDA data.

This chapter tackles our initial five research questions:

1. What is the level and trend for underemployment?

2. What are the main characteristics of underemployed individuals?

3. Is underemployment for individuals correlated with other dimensions of labour insecurity?

4. What is the pattern of persistence in underemployment? Are underemployment 'spells' typically short-lived or more persistent?

5. What are the main characteristics of underemployed households?

The following sub-sections consider each research question in turn.

The primary orientation of this chapter is a headcount measure of underemployment, though we occasionally refer to a volume measure. For the first four sub-sections we stay at the individual level of measurement, mainly using the sample of responsible adults framed in terms of our five labour status groups (see Chapter 1), but for the fifth sub-section we move to a household level of measurement, framed in terms of the seven household types introduced in Chapter 1.

2.1 The level and trend for underemployment

According to ABS data, the rate of underemployment (headcount) declined from 7.2 per cent in 2001 to 5.7 per cent in 2008, before rising again to 7.6 per cent in 2009 (Campbell et al. 2013, pp.22–24; see also ABS 2011, 2012). This can be compared to trends in the rate of unemployment, which showed a much sharper decline in the period from 2001 to 2008 (from 6.6% to 3.9%) before similarly climbing again in the period to reach 5.5 per cent in 2009.

ABS data are the best source for tracing trends in underemployment. But we can note here that HILDA data for all individuals show a similar pattern and reveal the persistent dominance of underemployment over unemployment, at least in headcount measures (Figure 2).

Figure 2: Underemployed and unemployed persons, all individuals[a], HILDA 2001–2009
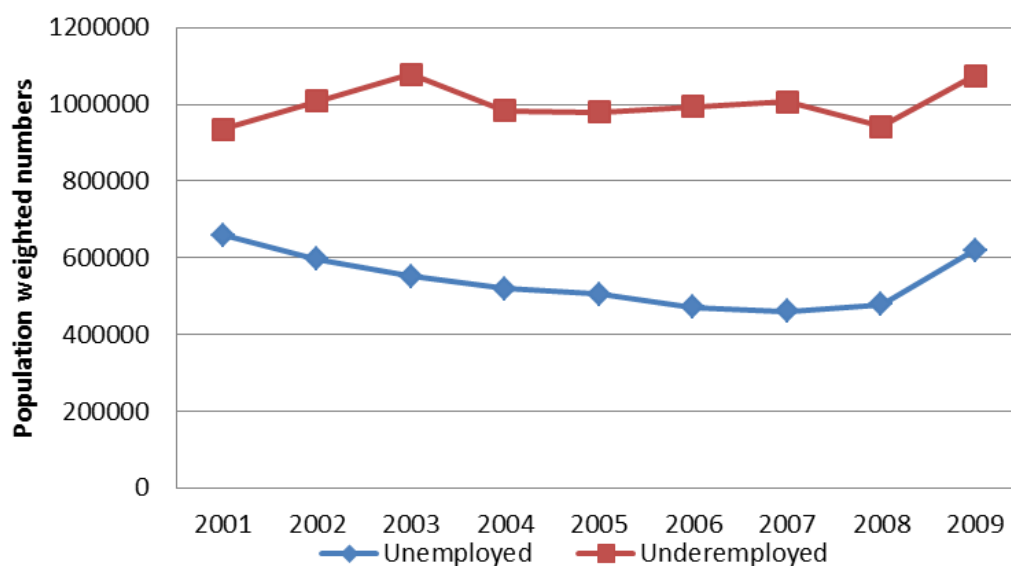
[a] HILDA weighted individual cross section of all individuals 2001–2009.

Source: HILDA release 9

2.2 Main characteristics of underemployed individuals

The personal and job characteristics of underemployed persons are briefly examined in our Positioning Paper, sometimes in conjunction with the characteristics of persons in other labour force statuses (Campbell et al. pp.26, 28–31). Here we extend the analysis by using HILDA pooled data for 'responsible adults', again presenting data on the underemployed in conjunction with parallel data for other labour force statuses. We examine a range of characteristics that apply to responsible adults in all five labour force statuses, including sex, age, residential location (section of state), marital status and housing tenure. We also examine job characteristics, which apply just to responsible adults who are employed, such as status in employment, sector of employment and occupation.

Table 7 below provides information for our five labour status groups on sex, age and residential location (section of state). It indicates that underemployed responsible adults are predominantly (70.3%) female. They are more likely than the adequately employed but less likely than the unemployed to be in the younger age groups—more than half (59.8%) are between 20 and 44 years of age. With respect to spatial location, few differences are apparent; the vast majority of the underemployed responsible adults, as in the case of all labour status groups, are found in 'major urban' and 'other urban' areas.

Table 7: Sex, age and section of state by labour status group, 'responsible adults', HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	Unemployed	NLF	All
Sex						
Female	35.8	79.2	70.3	52.1	65.5	53.7
Male	64.2	20.8	29.7	47.9	34.5	46.3
Total %	100	100	100	100	100	100
Age group (yrs)						
15–19	1.4	2.0	4.9	11.1	1.5	2.0
20–24	7.7	6.0	12.2	15.6	2.9	6.3
25–34	24.1	16.0	20.2	22.3	8.7	17.6
35–44	27.9	28.9	27.4	22.4	10.3	21.9
45–54	26.4	22.9	22.9	17.9	9.7	19.9
55–64	11.2	17.2	10.8	9.8	19.1	14.6
65–74	1.2	6.0	1.5	1.0	25.8	10.1
75+	0.2	1.0	0.1	0.0	21.9	7.6
Total %	100	100	100	100	100	100
Section of state						
Major urban	62.6	58.9	57.4	58.5	57.5	60.0
Other urban	21.8	22.5	26.7	29.4	26.8	24.0
Bounded locality	2.4	2.9	3.8	3.1	4.6	3.3
Rural balance	13.1	15.7	12.2	9.0	11.1	12.6
Migratory	0	0	0	0	0	0
Total %	100	100	100	100	100	100
N	*45,949*	*13,201*	*5,410*	*2,786*	*34,203*	*101,549*

Source: HILDA release 9

Data on *marital status* (not shown here) reveal only slight differences among the labour status groups. Underemployed responsible adults, like unemployed responsible adults, were more likely than the adequately employed to be single, and they were also more likely to be divorced, widowed or separated. Conversely, they were less likely to be legally married (though in this case the unemployed were even less likely to be legally married). Some of these differences could be related to the younger age profile of the underemployed and the unemployed responsible adults.

Health is a personal characteristic with rich potential implications for employment and housing. Data from a HILDA measure of self-assessed health indicate that 28 per cent of all responsible adults stated that they had a long-term health condition (Table 8). The underemployed were more likely to state that they have a long-term health condition than the adequately employed, but the proportion remained lower than among the unemployed and persons not in the labour force.

Table 8: Has a long-term health condition by labour status group, 'responsible adults', HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	Unemployed	NLF	Total
Yes	14.8	19.1	22.6	29.7	49.8	28.0
No	85.2	80.9	77.4	70.3	50.2	72.0
Total %	100	100	100	100	100	100
N	45,946	13,200	5,409	2,786	34,197	101,538

Source: HILDA release 9

Housing tenure is a particularly important characteristic from the viewpoint of housing outcomes. It is the pivot for much housing policy. Moreover, it is clearly a factor that mediates between the labour market and housing insecurity; whether and how individuals own or rent their housing is likely to shape their chances of experiencing housing insecurity. To a certain extent housing tenure could itself be seen as a rough indicator of housing insecurity. While there can be different threats to housing security within all types of tenures, outright owners are generally considered the most secure, followed by purchasers and renters (with private rental less secure than social housing), while those without conventional housing are considered the least secure. Housing tenure is therefore an important first indicator of the potential risks to housing insecurity that may stem from inadequate employment.

We consider housing tenure as a household characteristic later in this chapter (see Section 2.5 below), but consideration of the housing tenure of all responsible adults is useful for setting the scene. Table 9 below shows that underemployed responsible adults are predominantly in the categories of private rental (36%) and purchasers (37.9%). The proportion in private rental is larger than the figure for the adequately employed, though it is not as large as the figure for the unemployed. Only a small proportion of the underemployed is in social rental (5.2%), but once again the proportion stands between the proportion shown by the adequately employed and the proportion shown by the unemployed. Conversely, the proportion of underemployed who are purchasers is not as substantial as for the adequately employed, though it is stronger than for the unemployed. Similarly, the underemployed are less likely than the adequately employed, and much less likely than the NLF group, many of whom are retired and in older age groups, to be outright owners. These data suggest that the underemployed are more at risk of housing insecurity than the adequately employed, though less so than the unemployed.

Table 9: Housing tenure by labour status group, 'responsible adults', HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	Unemployed	NLF	Total
Private renters/caravan	27.2	19.7	36.0	47.5	16.0	23.5
Social rental	1.4	2.5	5.2	11.1	9.0	4.6
Purchasers	50.5	43.7	37.9	22.3	16.4	36.6
Outright owners	18.5	31.9	18.4	14.9	54.8	32.4
Rent free	2.4	2.2	2.5	4.2	3.8	2.9
Total %	100	100	100	100	100	100
N	45,194	13,015	5,326	2,751	33,894	100,180

Source: HILDA release 9

Other relevant characteristics for assessing the underemployed are job characteristics, which only apply to the employed, that is, the first three of our labour status groups. Few differences according to *status in employment* are evident (Table 10). The vast majority of the underemployed (85.9%), like the majority of the adequately employed, are employees. Similarly, there are few differences according to *sector of employment* (data not shown here). The underemployed were slightly more likely to be employed in private sector for-profit organisations (71.7%), but the differences with those employed full-time (70%) and the adequate part-timers (66.1%) were only slight.

Table 10: Status in employment by labour status group, 'responsible adults', HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	Total
Employee	88.6	83.8	85.9	87.4
Employer	3.8	2.7	1.3	3.4
Own account worker	7.3	12.0	11.9	8.6
Contributing family member	0.3	1.5	0.9	0.6
Total %	100	100	100	100
N	*45,949*	*13,201*	*5,410*	*64,560*

Source: HILDA release 9

Perhaps the clearest differences are associated with *occupation* (Table 11). The underemployed are less likely than the adequately employed to be found in the more skilled ANZSCO major occupational groups, such as managers and professionals; instead they are more likely to be found in the less skilled major groups, such as community and personal service workers, sales workers and labourers. Indeed, 54 per cent of the underemployed are in these three major groups, as compared to 25.4 per cent of the total workforce.

Table 11: Occupation by labour status group, 'responsible adults', HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	All employed
Occupation				
Managers	18.3	7.7	3.2	14.9
Professionals	25.3	26.2	16.6	24.8
Technicians and trades workers	16.0	6.2	7.9	13.3
Clerical and administrative workers	13.7	22.2	13.9	15.5
Community and personal service workers	6.8	14.8	20.3	9.6
Sales workers	5.2	9.8	14.8	6.9
Machinery operators and drivers	7.5	2.1	4.3	6.1
Labourers	7.2	11.0	18.9	8.9
Total %	100	100	100	100
N	*45,927*	*13,192*	*5,406*	*64,525*

Source: HILDA release 9

In short, underemployed responsible adults were more likely than the adequately employed to be female and in younger age groups. A slightly higher proportion, though still a minority, stated that they had a long-term health condition. Most important, the underemployed were

distributed unevenly according to housing tenure, being more likely than the adequately employed to be private renters or social renters, but less likely to be purchasers. For most characteristics the underemployed occupy a middle position between the adequately employed and the unemployed. Finally, we can note that underemployed responsible adults tend to be concentrated in the less-skilled occupational groups.

2.3   Underemployment and other dimensions of labour insecurity

Underemployment signals a lack of capacity to obtain sufficient hours in the job to satisfy the worker's needs. In effect, it signals for employees a lack of power in the employment relationship. As such, it would not be surprising if underemployment were joined with other indicators of poor job quality such as labour insecurity. Different dimensions of labour insecurity are usefully summarised by Standing (1999). In Australia, eight dimensions of labour insecurity (or 'precariousness') within jobs are commonly distinguished: income, employment, working time, work, functional, benefit, skill reproduction and representation insecurities (Burgess & Campbell 1998; see also Campbell, Whitehouse & Baxter 2009). In this schema, underemployment is closely tied to both income and working time insecurity (see also Chalmers et al. 2005).

The link between underemployment and other forms of labour insecurity reinforces concern with the possible consequences of underemployment for housing insecurity. Underemployment combined with other forms of labour insecurity will likely have a more profound impact on housing insecurity than underemployment alone. Of particular concern is the prospect that a lack of sufficient hours (and income) may be linked with irregular hours (and income), either as a result of intermittent employment or fluctuations within the one job. This in turn could have a substantial impact on housing insecurity. For example, if inadequate hours are joined by irregular earnings in employment, even if housing costs can be met, the time pattern of earnings may mean that it is difficult to meet fixed commitments such as rent and mortgage payments.

Our Positioning Paper uses data from the ABS and Wave 9 of HILDA to suggest that underemployed individuals were more likely than adequately employed part-time individuals and full-time individuals to be exposed to other aspects of labour insecurity (Campbell et al. 2013, pp.33–34). This sub-section explores the issue further by using pooled HILDA data from all nine waves for 'responsible adults'. We use a broad range of indicators, starting with income, difficulty in raising money and labour market attachment, before considering (just for employees) mean tenure with current employer, self-estimated chance of losing job in next twelve months, current work schedule, and type of employment contract.

Figures for average *annual gross income* suggest that the underemployed have substantially lower incomes than the adequately employed (Table 12). Particularly interesting is the substantial gap with the adequately employed part-time group. Low income is a source of insecurity, which suggests that people may be living on the edge, impeded from participating fully in the society.

Table 12: Average annual imputed gross income[a] by labour status groups, 'responsible adults', HILDA 2001–2009 ($)

	Employed FT	Adequate PT	Underemployed	Unemployed	NLF	All
Mean	58,715	34,669	25,861	21,958	18,746	39,544
Median	50,000	26,621	21,779	14,602	13,188	30,000
N	*45,463*	*13,054*	*5,332*	*2,676*	*33,075*	*99,600*

a. The sample is formed from HILDA pooled sample observations between 2001 and 2009 for persons with positive income values above zero. Gross income used in the table is based on imputed income values that includes aggregate market income, private transfers, Australian and foreign pensions and benefits and Family Tax Benefit Part A and Part B. The imputed figure excludes windfall (irregular) income.

Source: HILDA release 9

Low income is frequently associated with low savings and difficulty in raising money in the case of difficulties. One HILDA question, which we use elsewhere as an element in our measure of housing payment risk (see Section 1.3.4 above), asks about the degree of difficulty in raising $2000 ($3000 in 2009) in case of emergency. Figure 3 below shows the proportion in each labour status group who answered that they could not raise such a sum. The proportion is highest for the unemployed but it is also substantial for the underemployed, more than among the adequately employed.

Figure 3: Could not raise $2000($3000) in an emergency by labour status group, 'responsible adults', HILDA 2001–2009 (% in each labour status group)
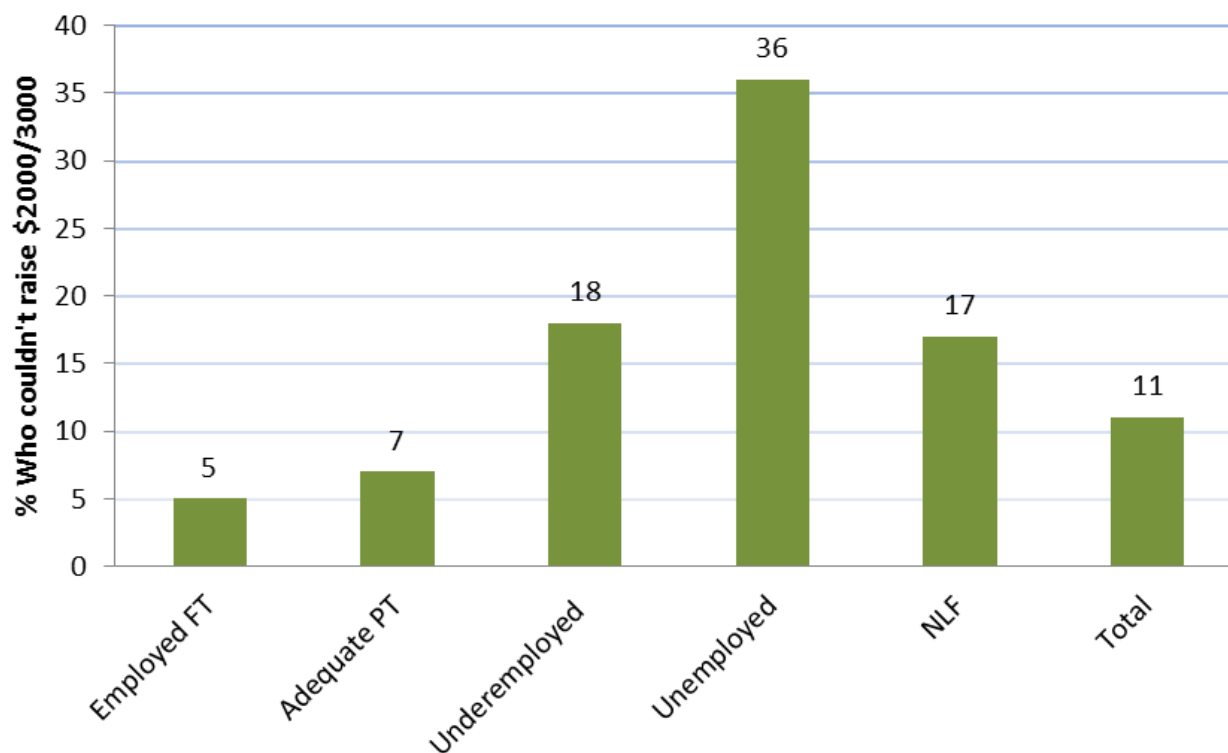
Source: HILDA release 9

Labour market attachment (or detachment) is a measure that offers a glimpse of the risk of intermittent employment (Table 13). This measure is derived from the HILDA employment and education calendar, where individual respondents are asked to nominate whether they have participated in particular economic activities over the past twelve months and, if yes, for how

long. This allows an estimate for individuals and groups of individuals of how their available time (on a continuum of zero to 100) in that twelve months has been distributed among the different activities that constitute the basic labour force framework (employment, unemployment, NLF status). This is not a perfect measure of intermittency since it measures self-assessed time in employment over the last financial year and does not measure the number of successive jobs that an individual might have held over that year. Nevertheless, it does offer some intriguing hints of greater intermittency among both the underemployed and the unemployed. The highest level of attachment to employment was shown by responsible adults who were employed full-time. Adequate part-timers were also likely to have spent a large percentage of time in employment, but they were more likely than full-time workers to have spent time out of the labour force. By contrast, the unemployed had spent little time in jobs and a greater proportion of time either unemployed or out of the labour force. From the point of view of labour market attachment, the underemployed stood between the adequately employed and the unemployed. They had spent the majority of their time in the past financial year in employment, but there was also evidence of significant time out of employment.

Table 13: Labour market attachment[a] by labour status group, 'responsible adults', HILDA 2001–2009 (mean % of time in last financial year)

	Employed FT	Adequate PT	Underemployed	Unemployed	NLF	All
% time spent in jobs	97.15	91.88	85.21	36.54	7.8	64.08
% time spent unemployed	1.27	1.89	6.63	41.08	2.54	3.16
% time spent not in labour force	1.58	6.24	8.16	22.36	89.63	32.76
% time in full-time education	1.76	6.15	9.02	10.10	2.72	3.27
N	45,949	13,201	5,410	2,786	34,203	101,549

a. Per cent time in jobs, unemployed, not in the labour force and in full-time education are derived variables that stem from the HILDA employment and education calendar. Because this is a derived variable, the N appears here as an expression of the entire sample population. The first three rows are mutually exclusive states where the proportions in the columns add to 100 per cent. The fact that the full-time employed have on average spent a small proportion of time unemployed or not in the labour force reflects the fact that labour force status is recorded at the time of interview but the calendar refers to activities over the previous twelve months. It is likely that some members of the employed full-time group will have spent some time during the previous twelve months unemployed or not in the labour force, before securing a full-time job.

Source: HILDA release 9

Labour insecurity is generally measured through job characteristics, which only apply to the employed and only allow a comparison between the underemployed and the two labour status groups defined as adequately employed. The remaining tables look at selected job characteristics just for a restricted sample of responsible adults who are employees.[9]

Data for *elapsed tenure with current employer* provide another perspective on intermittency, at least among employees. They show that on average the underemployed had a job with their current employer for a shorter period of time than the adequately employed (Table 14). The mean was 4.34 years, compared to 7 years for all employees. Medians are perhaps more revealing, since they eliminate the effect of the group of employees with long periods of tenure, sometimes stretching over decades. Here the median for the underemployed was only two

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[9] We restrict the sample to employees rather than the employed as a whole, because we judge that most forms of labour insecurity are applicable to an employment relationship and tend to be found primarily among employees. See Table 10 for the size of the group of employees among total employed persons.

years, half of the median for all employees. This indicates that the underemployed are more likely than the adequately employed to be moving in and out of employment.

Table 14: Average elapsed tenure with current employer by labour status group, 'responsible adults'[a] , HILDA 2001–2009 (years)

	Employed FT	Adequate PT	Underemployed	All employees
Mean	7.38	6.73	4.34	7.03
Median	4.00	4.00	2.00	4.0
N	*37,633*	*9,278*	*3,891*	*50,802*

[a.] The sample is formed from HILDA pooled sample observation in which persons are employed 2001–2009. The sample is restricted to employees.

Source: HILDA release 9

Self-estimated chance of losing a current job in the next twelve months is one part of a conventional measure of subjective employment insecurity (Green 2006). Table 15 below reveals that most employees were confident about retaining their job—the majority responded by saying there was 0 per cent likelihood of losing their current job. However, underemployed responsible adults had a self-estimated chance of losing their job that was significantly higher than the corresponding figure for the adequately employed.

Table 15: Self-estimated chance of losing job in next 12 months by labour status group, 'responsible adults'[a], HILDA 2001–2009 (% likelihood on a scale of 0 to 100%)

	Employed FT	Adequate PT	Underemployed	Total
Mean	9.74	9.39	14.14	10.05
N	*37,264*	*10,218*	*4,484*	*51,966*

[a.] The sample is restricted to employees.

Source: HILDA release 9

Table 16 below shows data for the *work schedules* of employees. This suggests that most employees in each of the three labour status groups have a regular schedule. Insofar as there are differences, the fundamental division seems to be between the adequately employed full-time employees and the part-time employees, whether adequately employed or underemployed part-time. Both groups of part-time employees are more likely than the adequately employed full-time to have an irregular schedule or to be on-call. Moreover, both are also more likely to have regular evening or regular night shifts.

Table 16: Regularity of shift by labour status groups, 'responsible adults'[a], HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	All employees
Type of shift worked				
Regular daytime	80.4	69.1	60.0	76.5
Irregular schedule	5.7	11.4	13.3	7.5
A rotating shift	8.3	7.6	7.6	8.1
Regular evening shift	1.6	4.5	7.3	2.6
On call	1.0	2.5	4.8	1.6
Regular night shift	1.4	2.6	3.7	1.9
Split shift	0.9	1.6	2.4	1.2
Other	0.6	0.6	0.9	0.6
Total %	100	100	100	100
N	*40,698*	*11,067*	*4,646*	*56,411*

[a] The sample is restricted to employees.

Source: HILDA release 9

Type of employment contract is an important indicator of labour insecurity. Indeed the division in Australia between permanent and casual forms of employment contract is often treated as the fundamental line of division between secure and insecure (or precarious) employment. Though this is too crude (Burgess & Campbell 1998; see also Howe et al. 2012), it remains true that labour insecurity is often concentrated in casual employment (Burgess & Campbell 1998).

HILDA data allow two measures of the type of employment contract for employees. The first corresponds to the long-standing, two-sided division between permanent and casual, as deployed in several ABS publications and measured by whether the job offers paid entitlements to annual leave and sick leave (ABS 2008). This is a relatively robust measure, but it is vulnerable to the criticism that it obscures the presence of fixed-term contracts, which may have paid leave entitlements, like standard permanent employment contracts, but lack basic employment security (Campbell & Burgess 2001). HILDA offers a way around this difficulty by developing a second measure of the type of employment contract, which distinguishes three rather than two types of employment contract: permanent, fixed-term and casual.

Table 17 below provides data for both measures. The results show stark differences among the three labour status groups. We can see here a division between full-time and part-time employees, and then a further division between adequately employed part-time employees and underemployed part-time employees. In the data using the standard two-sided measure, the majority (63.5%) of underemployed responsible adults were casual, and the remainder were permanent. This stands in sharp contrast to the adequately employed full-timers, where less than 10 per cent were casual, but it also stands in contrast to the adequately employed part-timers, where 45.5 per cent were casual. The contrast remains when we move to a three-sided measure. Here the majority (58.4%) of the underemployed were casual, with an additional small proportion (6.9%) categorised as on a fixed-term contract. Again, this stands in contrast to the adequately employed, especially full-time but also part-time employees.

Table 17: Employment contract by labour status groups, 'responsible adults'[a], HILDA 2001–2009 (% of each labour status group)

	Employed FT	Adequate PT	Underemployed	All employees
Security of contract[b]				
ABS definition				
Permanent	90.4	54.5	36.5	78.7
Casual	9.6	45.5	63.5	21.3
Total %	100	100	100	100
N	*35,363*	*9,837*	*4,172*	*49,372*
Security of contract				
Employed on a permanent or ongoing basis	82.1	50.4	34.0	71.7
Employed on a fixed term contract	10.3	8.2	6.9	9.6
Employed on a casual basis	7.3	41.1	58.4	18.3
Other	0.3	0.3	0.8	0.3
Total %	100	100	100	100
N	*35,357*	*9,836*	*4,171*	*49,364*

[a.] The sample is restricted to employees.

[b.] ABS definition of casual and permanent is 'employee without paid leave entitlements' and 'employee with paid leave entitlements' respectively.

Source: HILDA release 9

Two conclusions on underemployment and casual status are suggested by the data in Table 17. First we can note that not all casuals are underemployed; some casuals are included in the adequate part-time category and some appear in the adequate full-time category. This underlines the argument that the division between casual and more secure types of labour contract is not a perfect predictor of all forms of labour insecurity. Casual status may foster underemployment but it does not inevitably lead to underemployment. Second, we can note that, though not all underemployed responsible adults are casuals, the majority are. In short, there is a substantial overlap between underemployment and casual status. For this majority group it means that their lack of capacity to obtain sufficient hours in their job is likely to go hand-in-hand with the other deficits associated with casual status.

This sub-section suggests not only that underemployment can itself be seen as a form of labour insecurity but also that it is strongly linked with other forms of labour insecurity. Direct evidence suggests that the underemployed have less labour market attachment, shorter job tenure, higher fear of losing their jobs, greater likelihood of casual employment and more irregular schedules than the adequately employed.

The strongest evidence of a link between underemployment and labour insecurity comes from the data on underemployment and casual status. In our sample of responsible adults who were employees, the majority of the underemployed were classified as casual in their job. This provides both direct and indirect evidence of labour insecurity. The definition of casual status is based on lack of entitlement to forms of paid and unpaid leave, as well as lack of notice in case of dismissal and limited protection against unfair dismissal. Such direct benefit and employment insecurity readily spills over into working time and income insecurity. It also spills over into intermittency, with many casual employees churning between short-term jobs and spells of unemployment and periods out of the labour force. In addition, casual employees are

at high risk of working time and income insecurity in other, more indirect ways. Casuals are generally subject to some minimal protective regulation (minimum start times and sometimes penalty rates for non-social periods) under awards and agreements. However, a central feature of casual employment is the ability of employers to determine the number and timing of hours and to alter these at short notice (including reduce to zero). Casual employment can be used for small parcels of work, often at inconvenient times, and it can be used as a convenient reserve for occasions when demand might increase. At the extreme, casual employment shades off to on-call arrangements, where labour time seems available to employers on demand. This can be organised by firms through a carefully-maintained list of casuals who have offered themselves as ready for work, or a similar result can be obtained through use of temporary work agencies. Casuals appear here as easily available, easily deployed in the workplace, and then easily disposable.[10]

2.4   Persistence in underemployment

Related to the issues of labour insecurity discussed in the previous section (2.3) is the question of the *persistence* of underemployment. Underemployment is a state from which workers are seeking to exit. They are seeking to move into adequate employment, generally by obtaining more hours in the same job, an alternative job with more hours, or perhaps an additional job that can add on more hours. It could be argued that when underemployment is persistent, its negative effects will be exacerbated. While this is true in general, it is important to keep two points in mind. First, negative effects are also compatible with underemployment that is *not* persistent. Thus workers may exit from underemployment into unemployment or may move out of the labour force altogether, without having solved their underemployment problem, that is the lack of sufficient hours of paid work. Second, even in the case of successful pathways into adequate employment, the success may only be temporary, leading back to underemployment or indeed unemployment. In this case underemployment may not be persistent but it will be *recurrent*. Both points are underlined, by the strong overlap noted in the previous section (2.3) between underemployment and casual jobs, which are often short-term jobs within a pattern of intermittent employment. This would imply a large volume of movement in and out of underemployment, which can be seen as a churning movement within a broad 'grey zone' of poor quality employment.

As a panel survey, HILDA offers tools for examining some aspects of persistence. As noted in Chapter 1, one way of examining persistence is by looking at the probability of exiting a particular labour status between consecutive waves. Table 18 below shows strong persistence for the adequate full-time group, 89.1 per cent of whom were still in adequate full-time employment at the time of the next Wave (t+1), and moderate persistence among the adequate part-time group, 61.1 per cent of whom remained in adequate part-time employment. For the underemployed, the persistence in underemployment was only 34.3 per cent. This might appear to be good news. But it does not mean that the remainder of the underemployed had been able to solve their lack of hours by finding more hours (either in the same job or in other jobs). Some underemployed had indeed moved into adequate employment, either full-time (23.8%) or part-time (26.8%). Although this appears as a relatively good success rate, we can note that a further 4.2 per cent were now classified as unemployed and 10.9 per cent had slipped out of the labour force altogether. This supports an argument that persistence of poor outcomes might be more widespread than a simple definition of persistence in the same state of underemployment might suggest.[11]

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[10]   How these deficits work out in practice is highly variable, with significant differences according to industry conditions and employer strategies. For example, one study shows that casual employees in a retail enterprise tended to work short hours that were relatively unpredictable, while those in a hospitality enterprise worked longer hours in highly irregular, unpredictable and unsocial working time patterns (Walsh & Deery 1999).

[11]   The need for a broader viewpoint is particularly evident if we look at the unemployed. At first glance, the fact that only 25.1 per cent of the unemployed were still unemployed in the next wave might be seen as good news, but it is

Table 18: Transition probabilities for labour status groups between consecutive waves, 'responsible adults', HILDA 2001–2009 (% within origin labour status groups)

	Destination labour status (t+1)					
	Employed full-time	**Adequate part-time**	**Underemployed**	**Unemployed**	**NLF**	**Total %**
Origin labour status (t)						
Employed full-time	89.1	4.5	2.1	1.2	3.2	100
Adequate part-time	15	61.1	10.1	1.4	12.4	100
Underemployed	23.8	26.8	34.3	4.2	10.9	100
Unemployed	24.6	9.7	13.2	25.1	27.5	100
Not in the labour force	2.4	4.5	1.9	2.1	89	100
N	*37,231*	*11,054*	*4,222*	*1,895*	*28,633*	*83,035*

Source: HILDA release 9

A more direct measure of persistence is through 'spells', where a 'spell', as explained in Chapter 1, is defined as time spent continuously in one labour market state. Spells can be considered in terms of both length and number. This is a transition measure and in this case we need to distinguish more carefully between 'observations' and persons. As Table 19 below indicates, around 40 per cent of all observations of underemployment involved more than one spell. From this point of view the majority of underemployed observations appear short-lived, but there was a substantial group with a more persistent pattern.

Table 19: Spells of underemployment, 'responsible adults', HILDA 2001–2009

	Observations		Adults	
No. spells	**N**	**%**	**N**	**%**
1	3,275	*60.54*	2,368	*75.46*
2	1,631	*30.15*	635	*20.24*
3	483	*8.93*	129	*4.11*
4	21	*0.39*	6	*0.19*
Total	*5,410*	*100*	*3,138*	*100*

Source: HILDA release 9

Persistence tends to be unequally distributed. For all responsible adults the mean number of spells was around 1.5 and the mean length of each spell was 1.974 years (data not shown here). Both number and length are higher among women and older age groups.

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necessary to note that lack of persistence in unemployment does not necessarily mean that the unemployed had found a satisfactory job. Some 34.3 per cent had moved into a job classified as adequate in terms of the number of hours, but 13.2 per cent had moved into an underemployed job and a further 27.5 per cent had dropped out of the labour force entirely. If we adopt a broader definition of persistence as persistence of poor outcomes then the unemployed could be seen as having a strong persistence in poor outcomes between successive waves of almost 65.1 per cent.

2.5 Main characteristics of underemployed households

Chapter 1 introduces our typology of households, differentiated according to the labour force status of the responsible adults within those households. We distinguished seven household types, two of which involved underemployed persons, and we outlined HILDA data concerning both the distribution of responsible adults (Table 4) and the distribution of households (Table 5) among the seven household types.

This section shifts the unit of measurement from individuals to households. This allows us to situate underemployed responsible adults within our household types, and to examine the differences not only between underemployed households and other household types but also between our two underemployed household types, distinguished according to whether or not underemployed persons are joined with other earners in the household. By shifting the unit of measurement to the household, we are able to deepen the analysis of previously-discussed characteristics such as sex, age and housing tenure and to introduce new characteristics such as total household hours of paid work.

Most household types in our typology show a relatively even distribution of men and women (Table 20). The exception would seem to be underemployed single earner households, where most (61.5%) responsible adults are women. The pattern according to age is not marked, though there is some evidence that responsible adults in underemployed households tend to be in younger age groups (Table 20).

Table 20: Sex and age by household type, 'responsible adult' members of households, HILDA 2001–2009 (% of each household type)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Sex								
Male	49.9	49.3	49.8	38.5	50.8	47.5	40.5	47.0
Female	50.1	50.7	50.2	61.5	49.2	52.5	59.5	53.0
Total %	100	100	100	100	100	100	100	100
N	*33,659*	*25,308*	*6,010*	*2,683*	*1,901*	*2,094*	*23,604*	*95,259*
Age								
15–19 yrs	1.1	1.9	3.9	5.5	8.0	9.7	1.1	1.9
20–24 yrs	6.6	7.4	11.5	12.3	13.0	14.8	1.6	6.4
25–34 yrs	23.5	21.5	21.1	17.7	25.9	21.8	3.8	17.8
35–44 yrs	29.4	26.1	28.7	22.8	23.8	20.2	5.1	22.0
45–54 yrs	26.2	20.4	23.8	21.8	19.7	17.3	7.3	19.4
55–64 yrs	11.2	16.1	9.7	15.1	8.7	12.8	19.6	14.6
65–74 yrs	1.7	5.4	1.0	3.9	0.6	3.0	32.2	10.2
75+	0.3	1.2	0.3	0.9	0.3	0.4	29.3	7.7
Total %	100	100	100	100	100	100	100	100
N	*33,659*	*25,308*	*6,010*	*2,683*	*1,901*	*2,094*	*23,604*	*95,259*

Source: HILDA release 9

Household types show clear differences according to their *family* composition (Table 21). As could be expected the profile varies widely. It also varies between our two underemployed household types. For underemployed multiple earner households, the dominant family types are couples with dependent children (46.5%) and couples without dependent children (33.6%). For underemployed single earner households the dominant components are lone person (48%) and lone parent with dependent children (22.5%), though there is also a group of couples, either with (9.4%) or without dependent children (11.1%).

Table 21: Family type by household type[a], households, HILDA 2001–2009 (% of each household type)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		Unemployed			
Family type	**Multiple earners**	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Couple without children	44.1	13.8	33.6	11.1	35.2	13.1	33.5	29.1
Couple with dependent child	43.2	14.7	46.5	9.4	35.1	11.3	2.3	20.2
Couple with non-dependent child	4.8	1.8	3.6	1.5	3.5	1.1	2.0	2.8
Lone parent dependent child	0	9.4	0	22.5	0	14.8	5.4	5.6
Lone parent non-dependent child	0	2.5	0	1.9	0	1.2	3.0	1.8
Lone person	0	55.3	0	48.0	0	48.0	51.8	35.4
Group	3.0	0.6	4.6	1.8	6.9	1.9	0.7	1.6
Multi family	4.9	1.9	11.7	3.8	19.3	8.6	1.3	3.5
%	100	100	100	100	100	100	100	100
N	*14,227*	*16,004*	*2,424*	*1,817*	*777*	*1,293*	*15,909*	*52,451*

a. HILDA pooled household observations 2001–2009.

Source: HILDA release 9

Labour market characteristics are useful in helping to develop the profile of our seven household types. Already in Chapter 1, Table 6 presented a basic profile of each household type in terms of the *labour force status* of the responsible adult members. This revealed important differences between our two underemployed households. In the underemployed multiple earner household around half the responsible adult members were underemployed but many of the remainder were adequately employed. In the underemployed single earner household, by contrast, a higher proportion (75.6%) were underemployed and the remainder were unemployed or not in the labour force.

Labour market attachment shows a distinctive distribution, with most attachment to employment shown by responsible adults in adequately employed multiple earner households

and the least attachment to employment—apart from the special case of the all NLF household—shown by the unemployed without earners household (Table 22).

Table 22: Labour market attachment by household types, 'responsible adult' members of households, HILDA 2001–2009 (mean % of time in last financial year)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Per cent time spent in jobs	95.78	73.35	89.30	68.18	67.24	26.44	4.58	63.94
Per cent time spent unemployed	1.08	2.28	3.81	9.44	16.47	38.54	1.99	3.16
Per cent time spent out of labour force	3.14	24.36	6.89	22.38	16.29	35.02	93.43	32.89
Per cent time spent in full-time education	2.29	3.59	6.27	9.50	7.32	8.85	1.99	3.26
N	33,659	25,308	6,010	2,683	1,901	2,094	23,603	95,258

a. Per cent time in jobs, unemployed, not in the labour force and in full-time education are derived variables that stem from the HILDA employment and education calendar. Because this is a derived variable, the N appears here as an expression of the entire sample population. The first three rows are mutually exclusive states where the proportions in the columns add up to 100 per cent. The fact that the adequately employed have on average spent a small proportion of time unemployed or not in the labour force reflects the fact that labour force status is recorded at the time of interview but the calendar refers to activities over the previous twelve months. It is likely that some members of the adequately employed group will have spent some time during the previous twelve months unemployed or not in the labour force, before securing a job with adequate hours.

Source: HILDA release

As noted in a preceding sub-section, underemployment among responsible adults is strongly linked with *casual status*. Similarly, the data in Figure 4 below show that underemployed households, both multiple and single earner households, contain a higher proportion of employees who are casuals than all other households. This is particularly true for underemployed single earner households. This suggests that these households are likely to be affected not only by underemployment but also by other forms of labour insecurity.

Figure 4: Type of employment contract by selected household type, 'responsible adult' members of households[a], HILDA 2001–2009 (% of employees in each household type)
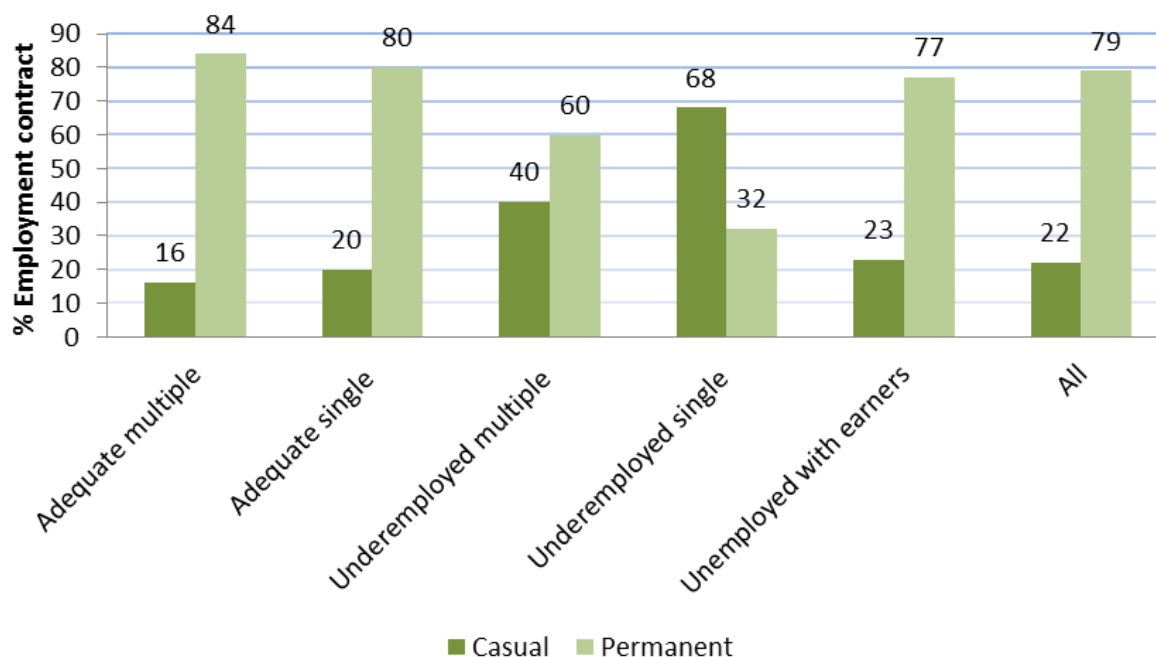
a. ABS definition of casual and permanent is 'employee without paid leave entitlements' and 'employee with paid leave entitlements' respectively. The sample is restricted to employees.

Source: HILDA release 9

Perhaps the most important characteristics for building a profile of households concern hours and income. If we examine average *total weekly household hours* of paid work in each household type, we can see the impact of having additional earners in the household (Table 23). The underemployed single earner household stands out in terms of the relative lack of weekly hours.

Table 23: Weekly hours of employment by household type, 'responsible adult' members of households, HILDA 2001–2009 (average aggregate weekly hours)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	
			Underemployed		*Unemployed*			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
Mean	80.8	41.3	62.8	18.1	47.8	0	0	44.9
Median	80.0	40.0	61.0	20.0	40.0	0	0	45.0
N	33,484	25,267	6,003	2,674	1,897	2,091	23,604	95,020

The table presents the total number of weekly hours worked for all responsible adults. Total weekly hours are calculated by summing the individual hours of all responsible adults.

Source: HILDA release 9

Reversing the perspective somewhat, we can look at a household measure of the weekly *labour hours deficit* (Table 24). A deficit only applies to the inadequately employed household types, that is underemployed and unemployed household types, since the calculation of the measure is limited to underemployed and unemployed persons (see Chapter 1). This is in effect a measure of the *extent* of inadequacy in employment. The data show a particular strong deficit in unemployed households and lower figures for underemployed households.

Table 24: Weekly labour hours deficit[a] by household type, 'responsible adult' members of households, HILDA 2001–2009 (average aggregate weekly hours deficit)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	
			Underemployed		*Unemployed*			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
Mean	0	0	13.90	17.6	31.65	35.32	0	2.7
Median	0	0	10.00	13.0	35.0	38.00	0	0
N	33,653	25,306	5,997	2,670	1,824	1,948	23,599	94,997

a. The table presents the total number of weekly hours deficit for all responsible adults. Total weekly hours deficit are calculated by summing the individual hours of all responsible adults.

Source: HILDA release 9

Data for *annual household income* are presented in Table 25 below. The absolute size of the figures is less important than the relative comparison among the household types. The table can be read as a rough indicator of financial advantage and disadvantage among the household types. The most prosperous households, even with this equivalised measure, are the adequately employed multiple earner households, while the least prosperous are the unemployed without earner households. Most of the other household types cluster around the average for all households ($35 000). One exception is the underemployed single earner household, where the mean equivalised income ($22 723) is only slightly above that of the unemployed without earner households ($18 786). Lower income is itself a factor in labour insecurity, with likely consequences for household insecurity.

Table 25: Disposable equivalised annual household income by household type, households, HILDA 2001–2009 ($)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Mean	49,911	37,675	38,573	23,071	36,705	19,105	20,723	35,238
Median	44,755	32,904	34,456	20,913	32,045	15,437	16,350	30,145
N	16,388	18,088	2,826	2,009	854	1,442	16,692	58,299

Household disposable income is equivalised using the 'square root scale' in which household income is divided by the square root of household size. Household disposable income is equivalised to adjust for the 'economies of scale' derived from living in a household with two or more people compared to a single occupant, that is, it is cheaper for two people to share household expenses than one person.

Source: HILDA release 9

It is useful to examine income more closely, in order to see how it has changed for each household type over the course of the nine waves of HILDA. To make sense of the figures it is advisable to convert into real income. Figure 5 shows the trend for real income for the different household types over the period from 2001 to 2009. This suggests that all household types experienced increases in real income, with most displaying a growth similar to the average (+ 29.2%). However, the poorer households tended to have smaller increases. The household type with the least growth, starting off an already low base, was the unemployed without earner household, which showed an overall increase over this period of only 6 per cent. Close to it, also off a low base, was the underemployed single earner household, which had an overall increase of only 12.9 per cent. This suggests that the income position of underemployed households may have improved absolutely but the income of underemployed single earner households deteriorated relative to adequately employed households.

Figure 5: Disposable equivalised annual real household income by household type, households[a], HILDA 2001–2009 (real $)
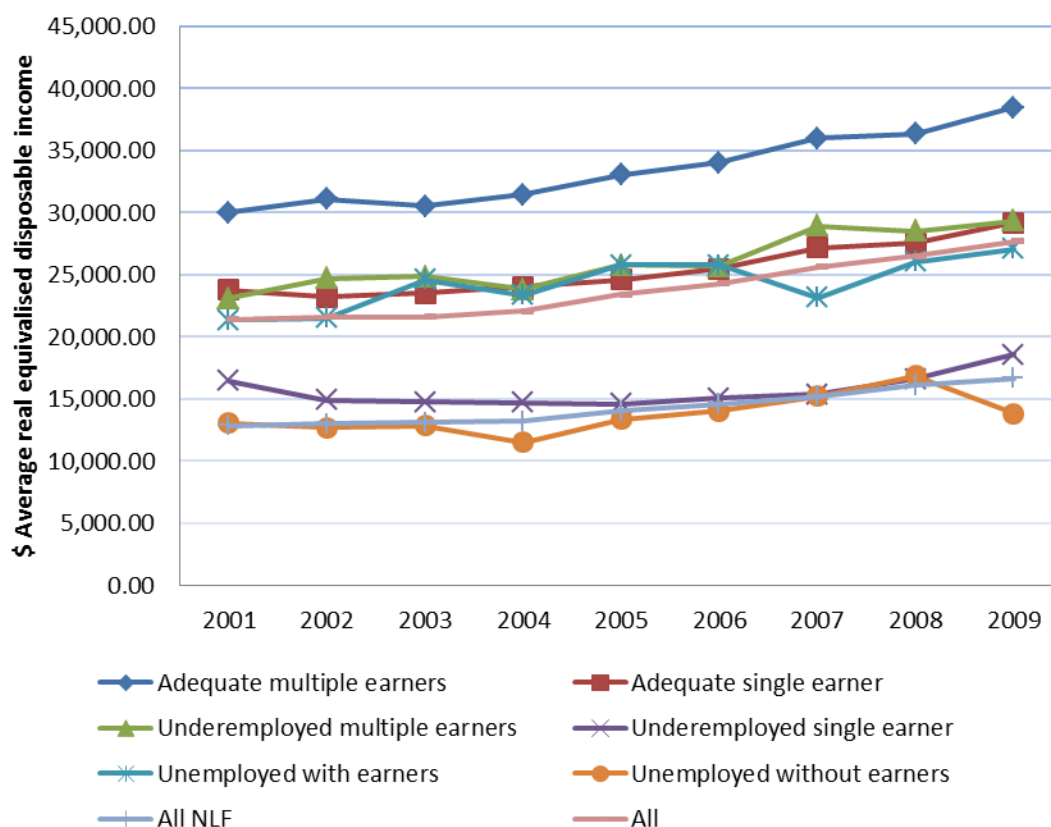
[a] HILDA weighted all households cross section 2001–2009. Real disposable income adjusted from consumer price index (CPI), figures taken from June quarter from 2001–2009, in 1989 dollars (Dec 1989 = 100).

Source: HILDA release 9

We noted above that housing tenure can shape the chances of experiencing housing insecurity. Table 26 below shows the profile of household types according to housing tenure. Compared to the adequately employed households, fewer underemployed households are outright owners. Most are purchasers or in private rental, with a small minority in social rental. However, the table also points to differences between the two underemployed household types, with purchasers (47.8%) more prominent as a proportion of all underemployed multiple earner households and private renters (48.2%) and social renters (9.3%) more prominent among underemployed single earner households.

Table 26: Housing tenure by household type, households, HILDA 2001–2009 (% of each household type)

	Household type							
	Adequately employed		*Inadequately employed*				*Not in the labour force*	*All*
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Private renters	20.2	36.1	28.3	48.2	39.9	51.3	14.2	25.6
Social rental	0.8	3.1	2.3	9.3	3.4	14.2	11.6	5.5
Purchasers	55.1	33.1	47.8	21.0	39.6	11.6	7.0	30.9
Outright owners	22.0	24.4	19.6	17.6	14.2	17.4	62.1	34.5
Rent free	1.9	3.3	2.0	3.9	2.9	5.5	5.1	3.5
%	100	100	100	100	100	100	100	100
N	*14,009*	*15,847*	*2,386*	*1,799*	*767*	*1,279*	*15,825*	*51,912*

Source: HILDA release 9

In short, the data framed in terms of household types reinforces the arguments advanced when we examined responsible adults in terms of labour status groups. They indicate that underemployed responsible adults have distinctive characteristics compared with the adequately employed on one side and the unemployed on the other side. The data, however, also point to differences between the two underemployed households. The underemployed multiple earner household is more in the mainstream, whereas the underemployed single earner household appears particularly disadvantaged and perhaps particularly vulnerable to housing difficulties, including housing insecurity.

2.6   Conclusion

This chapter offers extensive detail on characteristics, in building up its descriptive profile of underemployed persons and households. On most characteristics underemployment seems to occupy a middle position between unemployment and adequate employment. This has implications for housing insecurity. In particular, the HILDA data presented in this chapter suggest that underemployed persons are vulnerable to housing insecurity both because of an association of underemployment with low income and other forms of labour insecurity and because underemployed households tend to be concentrated in private rental, social rental and purchaser housing tenure.

3 UNDEREMPLOYED HOUSEHOLDS AND HOUSING INSECURITY

Chapter 2 profiled both the main characteristics of underemployed persons, in comparison with other labour status groups, and the main characteristics of underemployed households, in comparison with other household types. We suggested that underemployed persons were likely to be at risk of housing insecurity both because of the association of underemployment with low income and other forms of labour insecurity and because underemployed households tended to be concentrated in private rental, social rental and purchaser housing tenure.

This chapter directly examines the association between underemployment and housing insecurity. From the labour market side we start with a cross-tabulation framed in terms of our five labour status groups; however, the discussion in the main part of this chapter is framed in terms of our household typology, using the attribution approach which assigns our sample of responsible adults to seven household types (see Chapter 1). From the housing side we focus on our two main measures of housing insecurity: housing payment arrears and housing payment risk. As noted in Chapter 1 (1.3.4), related measures such as 'other bill payment difficulties' and 'income-supplementing strategies' can also be useful; we therefore add on an analysis in terms of these two additional measures. Finally, we explore the issue of underemployment and housing affordability, using in this last case our HILDA sample of households.

We are particularly interested in analysing the vulnerability of underemployed households to housing insecurity, in comparison with other household types. [12] Specifically, the chapter addresses the following main research question:

→ Do underemployed households have a higher incidence of housing insecurity compared to other household types? How does this vary with tenure?

This can be considered in terms of several subsidiary questions:

→ Is the incidence of housing payment arrears and housing payment risk higher among underemployed households compared with other household types?

→ To what extent do underemployed households, compared with other household types, encounter difficulties with paying other bills?

→ To what extent do underemployed households, compared with other household types, use income-supplementing strategies?

→ Has housing affordability for underemployed households declined over time compared with other household types?

The chapter begins by analysing the relationship between underemployment, primarily framed in terms of household types, and our two main measures of housing insecurity. This is followed by a discussion of other bill payment difficulties and income-supplementing strategies. As outlined in Chapter 1, these measures draw on the HILDA financial stress variables and other indicators of prosperity that are collected on an individual and not a household basis. Our discussion therefore is at the household level of measurement but it relies on an individual unit of analysis, using the sample of responsible adults. Finally we examine trends in housing affordability for our household types. The affordability measures are derived from variables on household monthly rental payments, household monthly mortgage repayments on all loans and

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[12] We are conscious that there is a potential two-way association between labour market and housing positions—housing position can be both a cause and a consequence of the household's employment position. Here we are not concerned with the direction of causality but merely seek to document the strength of the connection between underemployment and housing insecurity.

household equivalised disposable income. The unit of analysis for trends in housing affordability is the household itself.

3.1 Housing payment arrears and housing payment risk

Housing payment arrears is a measure derived from the HILDA financial stress indicator: 'could not pay the mortgage or rent on time' in the past twelve months because of a shortage of money. This measure is indicative of a cash flow problem that could be either one-off or more enduring. *Housing payment risk* is a variation on the typical housing stress measure and includes individuals and households who satisfy all of the following three conditions:

→ Paying over 30 per cent of equivalised disposable income on rental or mortgage costs.

→ Extreme difficulty in raising $2000 ($3000) at a time of need.

→ Self-rated prosperity as 'just getting by', 'poor' or 'very poor'.

When combined, these three indicators of housing stress signal that individuals and households are in a highly vulnerable position in their housing, both on a day-to-day basis in terms of 'getting by' and on a longer-term basis in terms of access to resources to cushion unexpected events.

We start with a simple cross-tabulation framed in terms of our five labour status groups (Table 27). These aggregate figures strongly suggest that the underemployed, like the unemployed, are more likely to experience payment arrears and housing payment risk, compared to the adequately employed. Thus, the figure for payment arrears among the underemployed is 14.8 per cent, more than double the rate for all responsible adults. Similarly, the figure for payment risk among the underemployed was 15.5 per cent, again more than double the risk for all responsible adults. The figures for the unemployed are even higher, but even in this simple cross-tabulation we can see that the underemployed, like the unemployed, are likely to experience substantial housing insecurity. The importance of underemployment as a locus of housing insecurity is reinforced if we look at the absolute numbers. Among the underemployed, the number of observations of housing payment arrears (711) and housing payment risk (736) exceeds the parallel numbers for the unemployed (472 and 593). In short, this table provides powerful evidence that already goes some way to answering our main research question concerning a link between underemployment and housing insecurity. It indicates that underemployment is strongly associated with housing insecurity.

Table 27: Incidence of housing payment arrears and housing payment risk by labour status groups, 'responsible adults'[a], HILDA 2001–2009 (% of each labour status group)

	Employed Full-time	Adequate part-time	Underemployed	Unemployed	NLF	All
Payment arrears %	6.7	6.2	14.8	20.2	6.4	7.3
N arrears	*2,715*	*746*	*711*	*472*	*1,906*	*6,550*
N All	*40,539*	*12,091*	*4,805*	*2,334*	*29,838*	*89,607*
Payment risk %	5.0	5.9	15.5	25.3	9.0	7.6
N payment risk	*1,997*	*702*	*736*	*593*	*2,834*	*6,862*
N All	*39,998*	*11,930*	*4,741*	*2,342*	*31,392*	*90,403*

[a.] HILDA unweighted pooled adult sample observations 2001–2009. Because the measures of housing insecurity are constructed from responses to the individual self-completion questionnaire, they are subject to a significant number of missing values. A pooled sample of 'responsible adults' would normally have an N = 102 000, but cross-tabulating to these measures has reduced the N to 90 403.

Source: HILDA release 9

Table 27 provides evidence for underemployed persons, but it is important to push further to a discussion framed in terms of underemployed households. A household level of measurement allows us to capture the effect of household composition and housing tenure. Figure 6 compares the incidence of payment arrears and payment risk by household types for our sample of 'responsible adults'.[13] Among the total population of 'responsible adults', around 7 per cent experienced housing payment arrears and around 8 per cent could be characterised as at housing payment risk. The proportions tended to be lower among responsible adults in the adequately employed and the all NLF household types. On the other hand, the proportions were higher among the responsible adults in the four inadequately employed household types. The 'unemployed without earners' household type appeared to display the most vulnerability to housing payment arrears and payment risk, followed closely by the 'underemployed single earner' household type and then the 'unemployed with earner' and 'underemployed multiple earner' household types.

The data are valuable in confirming the strength of the link between underemployment and our two measures of housing insecurity. They are also useful in pointing to the influence of the composition of the household. They suggest that the presence of other earners in both unemployed and underemployed households can lessen the likelihood of housing insecurity. Both housing arrears and housing payment risk are marked in underemployed single-earner households, but they are less evident in underemployed multiple earner households. We can see here that the presence of other earners *cushions* but does not fully eliminate the higher incidence of housing insecurity.

Figure 6: Incidence of housing payment arrears and housing payment risk by household type, 'responsible adult' members of households[a], HILDA 2001–2009 (% of each household type)
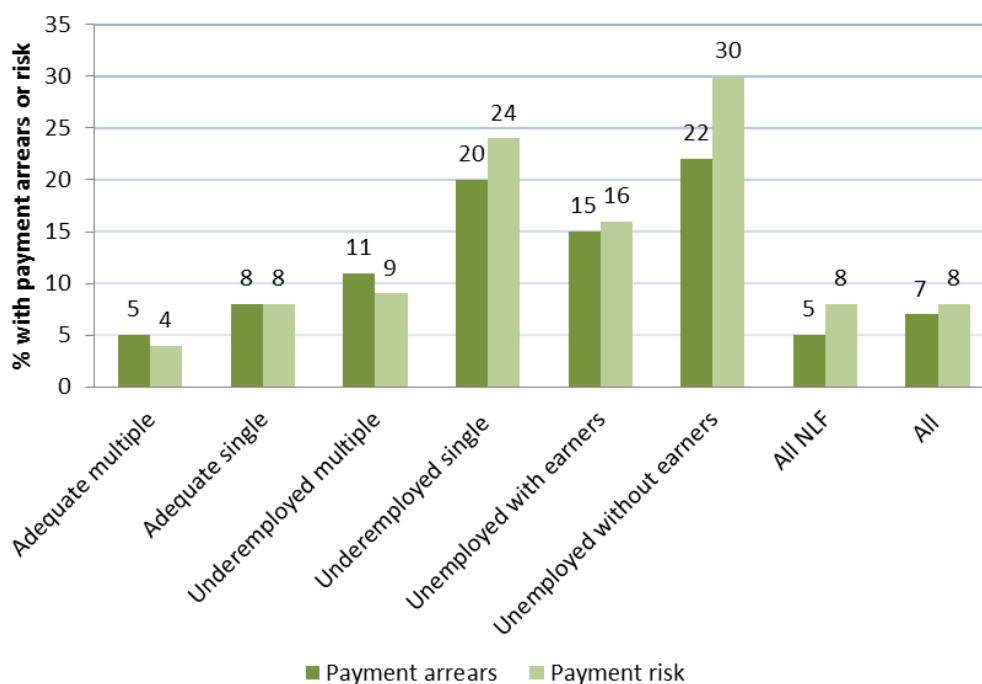
a. HILDA unweighted pooled adult sample observations 2001–2009

Source: HILDA release 9

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[13] It should be stressed that this involves a household level of measurement, but the unit of analysis remains that of individual responsible adults. Because housing payment arrears and housing payment risk are measures collected from individuals, using an individual unit of analysis is the most direct way of presenting the link. Moreover, it is most consistent with the approach taken with the modelling in the next chapter. Design of household measures of payment arrears and payment risk would involve assumptions about whose individual responses to select for the household measure. This is possible in principle but for ease of presentation and for consistency with modelling in Chapter 4 we have decided to restrict the household analysis here to the individual unit of analysis.

The aggregate picture provided in Figure 6 above suggests that underemployment, especially underemployment in single earner households, is associated with higher housing insecurity. However, it is important to disaggregate according to housing tenure, since it is likely that housing tenure shapes the extent and the likely form of housing insecurity. We start with a disaggregation of *housing payment arrears* (Table 28).[14] As noted in Chapter 2, housing insecurity is likely to be concentrated among individuals and households that are private renters, social renters and purchasers. The overall figures for private renters, social renters and purchasers in Table 28 confirm that the highest incidence of payment arrears is found among private renters (17.1%), followed by social renters (11.8%) and then purchasers (5.9%). But a revealing feature is the pattern according to household employment type, which underlines the heightened housing insecurity associated with inadequate employment, when compared with adequate employment. The highest figures for payment arrears in each housing tenure group tended to be found among responsible adult members in 'unemployed without earner' households', followed by 'underemployed single earner', 'unemployed with earners' and 'underemployed multiple earner' households. The proportions experiencing housing payment arrears are high, for example 28 per cent of responsible adults in underemployed single earner households who are private renters and 22.6 per cent of responsible adults in underemployed multiple earner households who are private renters. The proportions among purchasers are lower, for example 17.8 per cent of responsible adults in underemployed single earner households who are private renters and 7.9 per cent of responsible adults in underemployed multiple earner households who are private renters, but they are still substantial enough to provoke concern.

Table 28: Incidence of housing payment arrears in past 12 months by household type and tenure type, 'responsible adult' members of households[a], HILDA 2001–2009 (% within each cell)

	Household type						Not in the labour force	All
	Adequately employed		Inadequately employed					
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earner**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Private renters/ caravans	11.6	16.8	22.6	28.0	21.9	30.1	16.8	17.1
Social rental	12.4	13.9	13.2	24.3	25.5	17.6	8.5	11.8
Purchasers	4.1	6.3	7.9	17.8	10.9	21.9	11.5	5.9
Outright owners	1.5	1.7	2.7	3.6	7.0	6.1	1.9	1.9
Rent free	2.0	5.5	2.9	5.6	6.1	12.3	4.1	4.2
All adults	5.0	8.4	11.0	19.9	15.0	22.2	5.4	7.3
N Arrears	*1,500*	*1,857*	*590*	*459*	*247*	*383*	*1,109*	*6,145*
N All	*30,260*	*22,217*	*5,367*	*2,310*	*1,647*	*1,724*	*20,454*	*83,979*

a. Table 28 shows the percentage of responsible adults within each cell who reported yes to missing a payment on their rent or mortgage in the past 12 months. Private renters include those living in a caravan. Positive responses from those who are currently outright owners or living rent free may refer to previous periods in the past twelve months when they were paying for housing.

Source: HILDA release 9

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[14] The figures in Tables 27 and 28 represent the proportions in each cell. Thus they do not take account of the overall distribution of persons among these household types and tenure groups, and it is necessary to keep in mind that some of the cells are quite small in number. The figures are best seen as expressing the housing insecurity risk associated with membership of a household type and a tenure group. The row figures for 'all adults' reproduce the percentages shown in Figure 6.

Table 29 disaggregates the figures for *housing payment risk* according to housing tenure. This suggests that the incidence of housing payment risk is fairly equal for private renters (20.3%) and social renters (20.8%) but is less among purchasers (6.7%). The pattern according to household type reveals once again the heightened housing insecurity associated with inadequate employment, when compared with adequate employment. As in the case of housing payment arrears (Table 28), the highest figures for housing payment risk in each housing tenure group tended to be found among responsible adult members in 'unemployed without earner' households', followed by 'underemployed single earner', 'unemployed with earners' and 'underemployed multiple earner' households.[15] What is perhaps most noteworthy about Table 29 below is the marked unevenness of the distribution of payment risk, with modest numbers for the responsible adults in the adequately employed households but high numbers for responsible adults in the inadequately employed household types. For example, among private renters the incidence of payment risk reaches up to 46 per cent in 'unemployed without earner' households and 37.1 per cent in underemployed single earner households. Similarly, among purchasers the proportion is very low in adequately employed households, but it jumps to 27 per cent in 'unemployed without earner' households and 20.5 per cent in 'underemployed single earner' households. This indicates that the link between inadequate employment, both unemployment and underemployment, and household insecurity is stronger in the case of payment risk than in the case of payment arrears.

Table 29: Incidence of housing payment risk by household type and tenure type, 'responsible adult' members of households[a], HILDA 2001–2009 (% within each cell)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**Total**
Private renters/caravans	8.0	17.0	16.2	37.1	24.8	46.0	41.4	20.3
Social rental	8.6	16.8	14.8	34.9	21.8	32.0	20.8	20.8
Purchasers	3.8	7.8	8.1	20.5	13.8	27.4	21.1	6.7
Outright owners	0	0	0	0	0	0	0	0
Rent free	0	0	0	0	0	0	0	0
All adults[a]	3.7	8.2	8.7	23.9	15.9	30.2	8.3	7.7
N Arrears	*1,086*	*1,823*	*460*	*552*	*259*	*526*	*1,805*	*6,511*
N All	*29,651*	*22,168*	*5,271*	*2,309*	*1,642*	*1,740*	*21,889*	*84,670*

a. Those who are owners and living rent free are coded to zero for this measure of payment risk because they are deemed to not have current housing costs.

Source: HILDA Release 9

The data summarised here point to significant differences between our two underemployed household types. In general, as Figure 6 above indicates, housing payment arrears and housing payment risk is less widespread in underemployed multiple earner households than in underemployed single earner households. This pattern holds across all tenure groups. It

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[15] One exception is social rental, where the highest incidence of payment risk is shown by responsible adults in the underemployed single earner household (34.9%), overshadowing even the proportion in the 'unemployed without earner' household (32%).

reflects the cushioning effect on housing insecurity if other earners are present in the household. Nevertheless, in spite of this difference, it is important to note that both underemployed household types are more vulnerable to housing insecurity than the adequately employed household types. The tables indicate that problems of payment arrears and payment risk for the two underemployed household types are particularly evident when the households are involved in private rental, followed closely by social rental. On the other hand, purchasers have a reduced risk of housing insecurity.

The association between inadequate employment and housing insecurity can be viewed in another way by using a volume instead of a headcount measure. In Chapter 2, we present data on what we called the average weekly 'labour hours deficit' within our household types (Table 24). This offers a measure of inadequate employment that counts the labour hours desired by the underemployed and the unemployed. Most households had zero hours deficit because they do not include underemployed or unemployed persons. However, our two underemployed and two unemployed household types had varying degrees of labour hours deficit. It is possible to classify the results for all households according to the extent of the deficit, on a five point scale from zero (0) to very high (38+), and then examine the correlation with our two main measures of housing insecurity. The results in Figure 7 demonstrate clearly that the higher the extent of the labour hours deficit, whether derived from underemployment or unemployment, the higher the likelihood of experiencing payment arrears and payment risk.[16]

Figure 7: Incidence of housing payment arrears and risk by ranking of household weekly labour hours deficit[a], 'responsible adult' members of households[b], HILDA 2001–2009 (% of each ranked group)
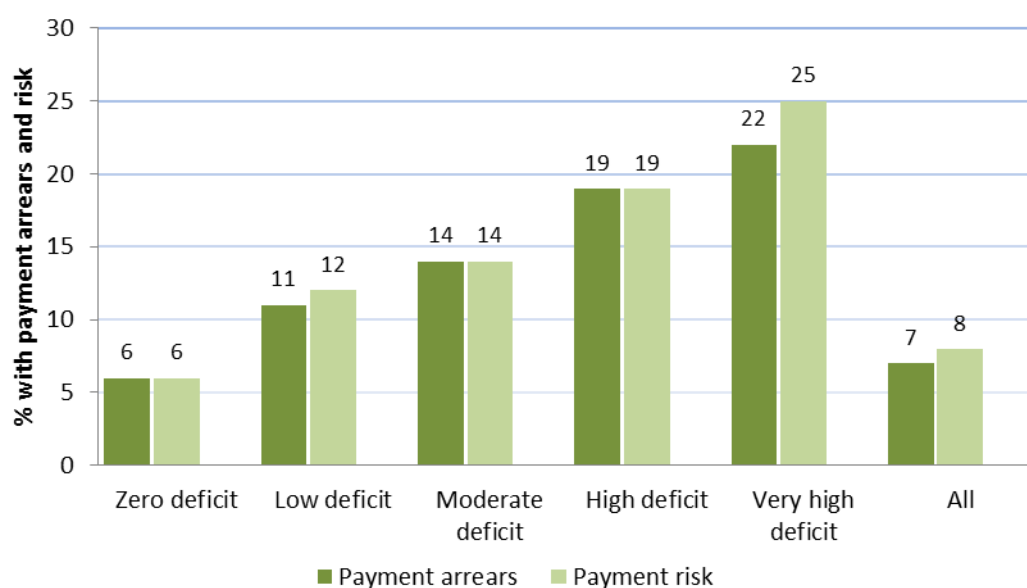
[a.] Zero deficit = 0; Low deficit = 1 to 10 hours; Moderate deficit = 11 to 24 hours; High deficit = 25 to 37 hours; Very high deficit = 38 and above.

[b.] HILDA pooled sample adult observations 2001–2009.

Source: HILDA release 9

In short, data for our two measures of housing insecurity indicate that the incidence of housing insecurity is higher among underemployed households compared with adequately employed household types. The presence of other earners in the household makes a difference, with underemployed multiple earner households less vulnerable than underemployed single-earner

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[16] Housing payment arrears and risk are closely aligned, showing strong internal consistency as measures of housing insecurity.

households. Housing tenure also has an influence, with housing insecurity in underemployed households most intense among renters, though it was also evident among purchasers.

3.2 Two additional measures

As explained in Chapter 1 (Section 1.3.4), one item from the HILDA financial stress indicators is used as the basis for our measure of housing payment arrears. Other items from these financial stress indicators can be combined in order to produce two additional measures related to housing insecurity. The first measure is referred to as 'other bill payment difficulties'. Its value is to broaden out the discussion. A weakness of the housing payment arrears variable as a marker for housing insecurity is that it may not accurately reflect the fragile state of a household's finances that eventually precipitate housing insecurity. Thus it does not capture cases where households seek to prioritise housing payments but are obliged to miss payments for utilities (e.g. electricity and gas bills) and other essential expenses. We assign our sample of responsible adults into the 'other bill payment difficulties' category if HILDA respondents indicate that because of a shortage of money in the last twelve months they experienced one or more of the following: (1) 'could not pay utilities on time'; (2) were 'unable to heat home'; or (3) 'went without meals'.

The second measure is called 'income-supplementing strategies'. It provides potentially valuable insights into how households make adjustments in response to or in anticipation of housing insecurity. Relevant items from the HILDA financial stress question include experiences in the past 12 months in 'seeking financial help from friends and family', 'seeking help from welfare/community organisations', and 'pawning or selling a possession'. Such income-supplementing strategies could be used to avert housing arrears.

3.2.1 Other bill payment difficulties

The overall incidence of other bill payment difficulties (17%), shown in Figure 8 below, is substantially higher than the overall incidence of housing payment arrears (7%). However, the pattern according to household type is similar, with the highest incidence shown by 'unemployed without earners' type, followed by the 'underemployed single earner', the 'unemployed with earners', and the 'underemployed multiple earner' types. This suggests that the unemployed and the underemployed households, in comparison with the adequately employed households are more likely to experience financial stress, but the extent of financial stress will be cushioned by the presence of adequately employed adults in the household.

Figure 8: Incidence of other bill payment difficulties in past 12 months by household type, 'responsible adult' members of households[a], HILDA 2001–2009 (% of each household type)
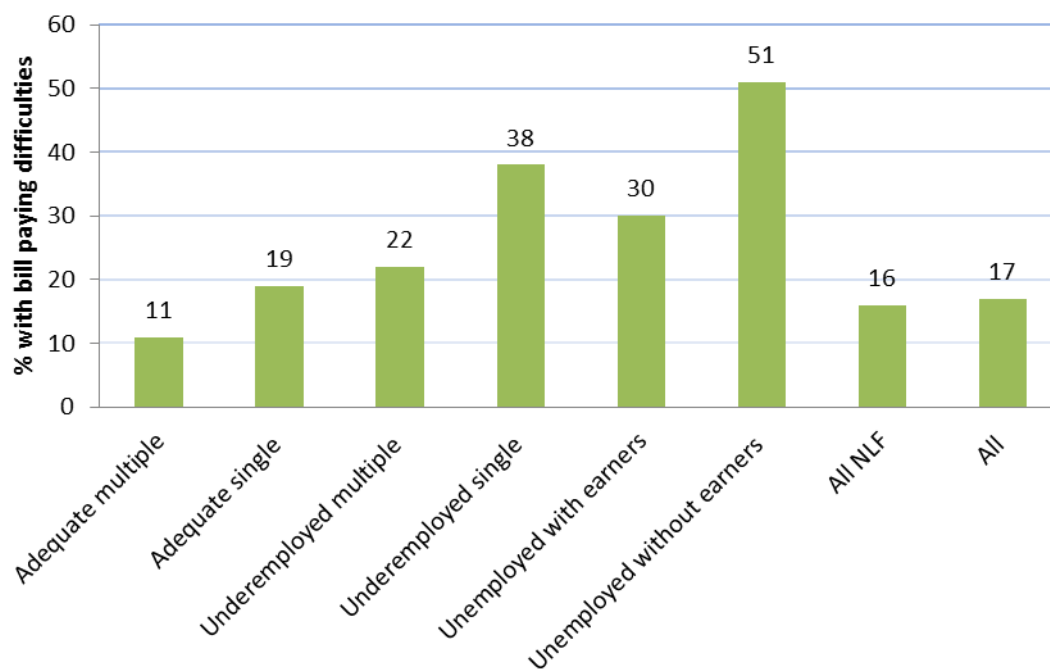
a. HILDA pooled sample adult observations 2001–2009.

Source: HILDA release 9

Table 30 below disaggregates the incidence of other bill payment difficulties by housing tenure, in order to determine whether there are notable differences across tenure groups as well as across household types. Many responsible adults in private rental (32.7%) and social rental (36.8%) reported struggling with these bills. In contrast to the pattern for payment arrears, where the incidence was highest among private renters, social renters were slightly more vulnerable to other bill payment difficulties. This is likely to reflect the greater ability of those in social rental to adjust or delay housing payments.

The broad pattern in Table 30 is consistent with the pattern for housing payment arrears, where those living in an unemployed household with no earners have the highest incidence, followed by those living in an underemployed single earner household. The levels of reported difficulty are high. Around half of responsible adults in underemployed single earner households, either in private rental (48.9%) or social rental (52.8%), reported other bill payment difficulties, and even among persons in underemployed multiple earner households the respective proportions (37.9% and 32.5%) were high. What is interesting is the extent to which underemployed households that were purchasers also reported significant levels of other payment difficulties (33.7% for the single earner and 18.2% for the multiple earner household). This suggests that purchasers, like private renters, may be under more pressure to prioritise housing payments at the expense of other bills.

Table 30: Other bill payment difficulties in past 12 months by tenure by household type, 'responsible adult' members of households[a], HILDA 2001–2009 (% within each cell)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
Private renters/caravans	22.3	31.0	37.9	48.9	42.4	60.2	38.5	32.7
Social rental	23.9	32.8	32.5	52.8	47.3	65.9	34.2	36.8
Purchasers	10.2	16.6	18.2	33.7	25.0	41.0	29.8	14.6
Outright owners	3.8	6.0	8.9	13.3	13.1	22.4	6.8	6.3
Rent free	7.3	19.2	15.5	31.1	18.4	44.1	14.7	15.5
All	11.2	18.5	22.1	38.1	30.4	50.5	15.9	16.9
N Difficulties	*3,402*	*4,135*	*1,195*	*896*	*507*	*889*	*3,301*	*14,325*
N All	*30,339*	*22,335*	*5,393*	*2,336*	*1,655*	*1,755*	*20,886*	*84,699*

[a.] HILDA pooled adult sample observations 2001–2009.

Source: HILDA release 9

In short, the proportion of responsible adults in underemployed households that face difficulties paying other bills is higher than the proportion in adequately employed households, with the highest incidence shown by responsible adults in underemployed single earner households.

3.2.2 Income-supplementing strategies

Living with adequately employed income earners is one way in which inadequately employed adults can cushion their exposure to payment difficulties and payment risk. We have seen evidence of this cushioning effect in the data presented above on the difference between underemployed single earner households and underemployed multiple earner households. From this point of view, living in a multiple earner household could itself be seen as an income-supplementing 'strategy'. However, this section is concerned with three income-supplementing strategies that offer a more immediate response to financial difficulties; asking for help from friends and family; asking for help from welfare/ community organisations; and pawning or selling possessions.

Table 31 below presents detail on these three income-supplementing items. The most common strategy was asking for help from friends and family, with smaller proportions reporting the other two strategies. Again, we can see a clear pattern, with responsible adults in inadequately employed households, compared with adequately employed households, more likely to have used such strategies in the past 12 months. The most frequent use was found among responsible adults in unemployed without earner households, followed by underemployed single earner, unemployed with earner and underemployed multiple earner households.

Table 31: Income-supplementing strategies in past 12 months by household type[a], 'responsible adult' members of households, HILDA 2001–2009 (% of each household type)

	Household type							
	Adequately employed		**Inadequately employed**				**Not in the labour force**	**All**
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
Asked for help from friends and family	9.1	15.6	19.4	33.3	27.7	40.5	10.5	13.5
N	*30,741*	*22,506*	*5,463*	*2,362*	*1,672*	*1,762*	*20,798*	*85,304*
Asked for help from welfare/ community organisation	0.9	3.0	3.7	12.7	8.0	23.8	5.7	3.8
N	*30,685*	*22,452*	*5,434*	*2,341*	*1,665*	*1,754*	*20,778*	*85,109*
Pawned or sold a possession	2.4	5.0	6.0	12.2	10.1	22.9	5.2	4.8
N	*30,710*	*22,454*	*5,440*	*2,337*	*1,662*	*1,749*	*20,710*	*85,062*

Source: HILDA release 9

In short, the proportion of responsible adults in underemployed households that resort to these three income-supplementing strategies is substantially higher than the proportion in adequately employed households, with the highest incidence shown by responsible adults in underemployed single earner households.

3.3   Housing costs and affordability

Housing costs and affordability are important background factors in understanding housing insecurity. An examination of trends in housing costs and housing affordability over the period from 2001 to 2009, as revealed in HILDA data, can extend the cross-sectional perspective that we have adopted in the major part of our research project. It can assist in assessing whether such trends are likely to be exacerbating or ameliorating housing insecurity for underemployed households. In this way it can help pave the way for appropriate policy initiatives.

We start with mortgage costs and then move on to rental costs, before considering housing affordability. Housing affordability is conceptualised and measured in various ways and has been the subject of significant debate among housing researchers over the past few years (Yates et al. 2007; Burke et al. 2011). Measures of affordability typically examine the relationship between housing costs and incomes, or how much household income is absorbed by housing costs and whether there is an adequate amount left over to live on after rents and mortgages have been paid. Readily available HILDA measures for housing costs and income are computed on a household basis, allowing us to examine the household itself as the unit of analysis. We calculate real housing costs against changes in the Consumer Price Index. We also examine trends in the housing cost-to-income ratios for different household types. Despite the crudeness of this measure, it is useful in indicating whether the generally low incomes of the inadequately employed are offset by low housing costs or if they face increasing affordability pressures over time.

3.3.1 Mortgage costs

Table 32 below presents the real changes in mortgage repayments from 2001 to 2009. They have risen across the board in the whole period by 41.7 per cent, much higher than the increase in rents (see Section 3.3.2 below). As shown, the housing costs of underemployed households are generally lower than the adequately employed and slightly higher than the unemployed. Typically the adequately employed with multiple earners have the highest mortgage costs of all household types; this is likely to reflect the higher earnings among these households and therefore their capacity to consume more expensive housing. Between 2008 and 2009 there was a general decline in purchaser costs for all groups except the underemployed single earner and the all NLF households. Declines in mortgage repayments most likely reflect rapid reductions to interest rates during the peak of the GFC. Most important, over the entire period from 2001–2009, the increase in mortgage payments is most marked among the underemployed compared with other household types.

Table 32: Median monthly real mortgage repayments by household type[a], purchaser households, HILDA 2001–2009 ($)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
2001	731.69	597.16	597.91	389.39	527.65	487.29	332.58	642.75
2002	726.74	581.40	631.54	473.84	581.40	472.38	323.40	631.54
2003	768.58	636.94	615.00	384.29	584.57	353.86	353.86	672.33
2004	828.73	675.41	720.30	450.28	675.41	375.0	414.36	727.90
2005	943.40	731.81	731.81	526.95	758.09	539.08	347.04	792.45
2006	972.13	777.71	750.49	528.19	900.84	545.69	436.16	845.11
2007	1,015.87	825.40	882.54	760.63	751.75	540.95	413.97	888.89
2008	1,122.11	924.06	976.91	557.72	911.30	729.04	407.05	989.67
2009	1,040.72	884.43	910.78	598.20	780.84	390.42	494.61	910.78
% change	*42.23*	*48.11*	*53.32*	*55.17*	*47.83*	*-19.9*	*48.7*	*41.7*

[a.] HILDA weighted purchaser HOUSEHOLD cross section 2001–2009. Real mortgage repayments adjusted from consumer price index (CPI), figures taken from June quarter from 2001–2009, in 1989 dollars (December 1989 = 100).

Source: HILDA release 9

The disparity in mortgage costs among households invites the question of whether differences may be attributable to cheaper housing. Table 33 below shows the median value of the primary residence for our household types for the year 2009. As shown, there are slight differences, as reflected in the loan-to-value ratios calculated from the median debt owing to median value of the home, between the adequately employed and underemployed. The underemployed single earner household has lower overall debt compared with their adequately employed single earner counterparts—potentially indicating that they have purchased their homes less recently.

The adequately and underemployed multiple earning purchasers have comparable levels of debt although the former have slightly more expensive housing.

Table 33: Loan-to-value (LTV) ratios by household type[a], purchaser households, HILDA 2009

	Median amount owing on primary residence ($)	Median value of primary residence ($)	LTV
Adequately employed multiple earners	200,000	500,000	0.4
Adequately employed single earner	174,000	400,000	0.43
Underemployed multiple earners	197,000	450,000	0.44
Underemployed single earner	120,000	400,000	0.3
Unemployed with earners	160,000	380,000	0.42
Unemployed without earners	120,000	350,000	0.34
All NLF	91,000	400,000	0.23

[a.] HILDA weighted purchaser household cross section 2009 only.

Source: HILDA release 9

3.3.2 Rental costs

Real rents, as shown in Table 34 below, have typically risen across the board over this period by around 20 per cent.[17] This is less than the rise in real mortgage payments, but it remains substantial, with the pattern of increase accelerating somewhat from 2005 to 2009. Moreover, there is a marked unevenness in the experience of rent rises according to household type. Real rents of those who are unemployed with and without earners in their household declined from 2007 onwards, while rents for all NLF households also declined from 2008. However, the increase in median rents for the underemployed with multiple earner household type was particularly sharp, exceeding all other household types. Differences in rental payments among household types are likely to be influenced by many interacting factors and it is difficult to speculate from costs data alone, without extending the analysis to income (see below). But the increases evident here provide at least prima facie evidence of an elevated risk of housing stress for particular household types, including in particular underemployed multiple earner households.

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[17] Though it is true that the dynamics affecting rents are somewhat different in the case of private rents and social rents, we merge the two together in this analysis in order to facilitate a more streamlined presentation. For information on the relative importance of private rental and social rental in our seven household types, see Table 25 above.

Table 34: Median monthly real rental costs by household type[a], renter households, HILDA 2001–2009 ($)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	**Single earner**	**Multiple earners**	**Single earner**	**With earners**	**Without earners**	**All NLF**	**All**
2001	617.34	487.29	519.43	422.27	519.43	389.39	304.93	454.41
2002	631.54	460.76	568.31	378.63	521.08	337.94	293.60	441.86
2003	615.00	491.86	569.00	399.86	553.43	368.72	296.53	459.31
2004	660.22	479.97	570.44	375.0	629.83	405.39	300.41	450.28
2005	673.18	468.33	570.75	424.53	629.38	380.73	307.28	468.33
2006	675.96	492.55	619.57	422.55	521.06	385.61	329.23	478.94
2007	700.95	537.78	634.29	455.24	662.22	455.24	330.79	496.51
2008	712.64	526.12	765.49	461.73	633.66	408.87	369.38	501.82
2009	780.84	572.46	802.40	481.44	650.30	364.07	364.07	546.11
% change	*26.48*	*17.48*	*54.47*	*14.01*	*25.19*	*-6.50*	*19.39*	*20.0*

[a.] HILDA weighted renters household cross section 2001–2009. Real rental costs adjusted from consumer price index (CPI), figures taken from June quarter from 2001–2009, in 1989 dollars (December 1989 = 100).

Source: HILDA release 9

3.3.3 Housing affordability

To assess affordability, we need to relate housing costs to income. Average household incomes for our seven household types are discussed in Chapter 2 (Section 2.5; see Table 25). The data suggested that underemployed households had equivalised incomes that were lower than their adequately employed counterparts. While lower housing costs among the underemployed are likely to offset some of the shortfall in household incomes, it could be hypothesised that many will be paying above an affordable threshold due to the overall decline in the availability of stock, both purchased and rental housing, at the lower end or affordable segment of the market (see Campbell et al. p.36). The standard benchmark of affordability using a housing cost-to-income ratio approach is whether a household's housing costs exceed 30 per cent of their equivalised disposable income (Wood & Ong 2011). We can use this benchmark to compare whether the household types fall above or below this 30 per cent threshold.

Using HILDA data over the nine waves, we can calculate median affordability ratios (housing costs as a proportion of income) for both purchasers and renters, disaggregated by household type. Table 35 below presents the median affordability ratio for purchasers, while Table 36 below presents the median affordability ratio for renters.

Table 35 shows that, with the exception of the common drop in 2008–2009, the general trend for purchasers over this period has been one of declining affordability. This trend has been most marked for inadequately employed households, in comparison with the adequately employed, where the decline has only been modest, and the not-in-the-labour-force household, where affordability seems to have improved over this period. The relative position of

underemployed households has deteriorated over this period. In 2001, underemployed purchasers had mortgage repayment to income ratios that were largely on a par with the adequately employed. However, by 2009 the mortgage to income ratios of the underemployed exceeded the adequately employed by 6 percentage points for multiple earner households and 2 percentage points for underemployed single earners. This suggests increased difficulties and stress for underemployed households over this period, in the face of mortgage payment constraints.

Table 35: Median purchaser affordability by household type[a], purchaser households, HILDA 2001–2009 (mortgage costs as a % of disposable equivalised household income)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		Unemployed			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
2001	31.9	30.8	31.6	29.5	31.3	31.3	30.6	31.4
2002	30.9	31.4	31.4	35.6	33.1	37.8	32.5	31.5
2003	34.4	32.8	30.2	30.9	35.8	32.8	34.6	33.3
2004	35.0	34.5	39.4	37.8	38.2	55.0	36.8	35.5
2005	37.9	36.3	35.6	38.4	38.9	46.1	24.4	36.8
2006	38.0	38.2	39.1	42.3	47.2	37.1	35.4	38.2
2007	38.0	38.6	41.3	47.2	36.7	37.1	34.9	38.2
2008	41.0	43.1	43.4	43.0	38.2	54.0	39.6	41.8
2009	33.9	35.8	39.0	37.8	36.6	42.0	27.5	34.5

a. HILDA weighted purchaser household cross section 2001–2009.

Source: HILDA release 9

We noted above the rise in real rents for different household types, especially the underemployed multiple earner household. Table 36 below suggests an overall stability in affordability for renters over this period. However, again there is a notable unevenness in the pattern according to household type. For renters, the adequately employed household types, both single and multiple earners, consistently paid below 30 per cent of their incomes on housing costs. In contrast, the rent to income ratio for underemployed multiple earner households increased from 32 per cent in 2001 to 41 per cent by 2009. For underemployed single households, the median rent to income ratio reached a peak of 42 per cent in 2007 before dropping to 36 per cent in 2009. This suggests deterioration in rental affordability for both underemployed household types, in contrast to the experience of the adequately employed.[18]

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[18] It is difficult to fully establish the extent to which high housing costs may be influencing part-time workers to move into or remain in the status of underemployment. Assuming the status of an underemployed worker is likely to involve a two-way interaction between labour market position and housing costs as households try to resolve their housing consumption needs. However, given that underemployed households are not able to obtain the hours they prefer in the context of potential housing consumption constraints suggests an important influence of inadequate labour demand over excessive housing costs.

Table 36: Median renter affordability by household type[a], rental households, HILDA 2001–2009 (rental costs as a % of disposable equivalised household income)

	Household type							
	Adequately employed		Inadequately employed				Not in the labour force	All
			Underemployed		*Unemployed*			
	Multiple earners	Single earner	Multiple earners	Single earner	With earners	Without earners	All NLF	All
2001	27.8	29.4	31.6	37.4	35.1	40.2	34.8	31.7
2002	30.0	28.7	30.3	38.7	35.9	38.1	34.6	31.6
2003	28.6	29.8	31.4	40.4	31.6	44.6	34.7	31.9
2004	27.2	28.6	32.4	35.4	37.1	48.4	35.7	31.4
2005	27.4	27.2	33.4	36.4	30.4	43.1	35.9	30.9
2006	27.5	28.4	34.8	41.2	31.5	36.5	35.7	30.8
2007	28.1	27.8	34.4	41.7	43.3	46.4	34.8	31.1
2008	26.6	27.8	38.4	39.1	38.3	37.3	37.1	31.2
2009	27.8	29.0	40.8	35.7	31.9	40.2	36.3	31.3

a. HILDA weighted renter HOUSEHOLD cross section 2001–2009.

Source: HILDA release 9

3.3.4 Summary

In short, the discussion of housing affordability suggests that increasing mortgage and rental costs over time absorb a significant proportion of the limited incomes of the inadequately employed. There is little sign of these affordability pressures easing in the longer term. Purchasers in particular have experienced a decline in affordability for much of the decade, regardless of their household type. Compared with the adequately employed, the decline in affordability, however, is steeper for underemployed purchasers, both those living in multiple and single earning households. The rapid adjustment to interest rates during the GFC seems to have provided some relief for purchasers as a group, but may only be a temporary measure. For renters, the overall pattern is closer to stability. But housing affordability for renters in underemployed multiple earner households has deteriorated, with the median reaching a difficult level of 40.8 per cent in the latest figures. For renters in underemployed single earner households affordability has fluctuated over this period, but it has always remained uncomfortably above the affordability threshold of 30 per cent. In contrast, rents for the adequately employed have remained below the affordability threshold over the nine-year period.

It is likely that many underemployed purchasers and renters are falling through the housing assistance safety net. The findings suggest the need for additional income support to relieve affordability pressures for underemployed households paying high rents and mortgages. These policy implications are discussed further in Chapter 5.

3.4 Conclusion

This chapter directly examines the association between underemployment and varied measures of housing insecurity. A simple cross-tabulation of our sample of responsible adults, framed in terms of labour status groups, clearly demonstrates one fundamental and crucial conclusion: that the underemployed are more vulnerable than the adequately employed to housing payment arrears and housing payment risk.

The main part of the chapter is concerned with examining this association more closely at a household level of measurement. The pattern of association is clear and consistent across all measures, both our two main measures of housing insecurity (payment arrears and payment risk) and the two additional measures of other bill payment difficulties and income-supplementing strategies. Underemployed households are more vulnerable than adequately employed households to housing insecurity. The household level of measurement extends the discussion first by revealing differences between the two underemployed household types. The underemployed single earner household is the most vulnerable to housing insecurity. The presence of other earners in the underemployed multiple earner household acts to cushion but not eliminate the association with housing insecurity. The household level of measurement also allows a closer attention to the influence of housing tenure. Here we can see that the vulnerability of underemployed households to housing insecurity is shaped by housing tenure, with private and social renters, in comparison to purchasers, consistently showing the higher incidence of payment arrears, payment risk, other payment difficulties, and recourse to income-supplementing strategies.

Finally the chapter examines the influence of trends in housing costs and housing affordability. The analysis suggests that these trends are putting pressure on underemployed purchasers and underemployed rental households.

4 MODEL ESTIMATES OF EMPLOYMENT ADEQUACY AND HOUSING INSECURITY

Chapter 3 demonstrated that those with underemployment present in their household are, when compared with the adequately employed, more likely to be insecure in their housing. We showed a strong descriptive association between underemployed households and several measures of housing insecurity, including in particular housing payment arrears and housing payment risk.

However, descriptive analysis alone is limited as a basis for inferences. It cannot establish whether the association between the adequacy of employment and housing insecurity is a result of the characteristics of underemployed individuals or whether there is something about the nature of underemployment itself that increases their vulnerability. The use of regression techniques can isolate the impact of underemployment while holding other characteristics such as age, education and so on constant.

This chapter presents modelling results for our two measures of housing insecurity—housing payment arrears and housing payment risk (see Chapter 1 for measurement details). There are two aims. The first is to ascertain whether simple measures of the incidence of underemployment raise the risk of payment arrears and payment risk among renters and purchasers. A second aim is to explore whether the persistence of underemployment increases vulnerability to housing insecurity. With these aims in mind, we address the following research questions:

→ Do correlations between underemployment and housing insecurity outcomes still hold after controlling for other individual and household attributes?

→ Does the persistence of underemployment increase the odds of housing insecurity?

4.1 Research approach

Our sample is an unbalanced sample of the pooled observations of all responsible adults participating in the first nine waves of the HILDA survey (2001–2009). We model renters and purchasers separately because there are important controls, such as equity accumulated in a purchaser's primary residence, that are not relevant in both tenures.[19] The dependent variable in each model is a dichotomous indicator of payment arrears (or payment risk) that will reflect whether an individual is prone to housing insecurity. The right-hand side 'explanatory' variables include a set of binary variables from our household typology. Specifically, with respect to measuring the impact of underemployment, we include two separate binary variables—one for those living in an underemployed single earner household and another for those in a underemployed multiple earner household (see Chapter 1 for definitions of the seven household types). These are key variables for testing our ideas about the importance of underemployment, but they are crude measures because they take no account of the scale of underemployment at any point in time. The scale of a household's underemployment is addressed by estimating models that include interaction variables between household types and a household measure of labour hours deficit, which is an hours-based measure of the gap between actual household labour supply and adequate household labour supply (see Chapter 1).

A second issue concerns persistence; that is whether the underemployment is temporary or enduring, and if short lived, is the escape from underemployment permanent? Persistence of underemployment is captured by including both lagged (past) and contemporaneous (current) measures of underemployment as explanatory variables. The inclusion of a lagged variable

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[19] We model social renters and private renters together so that we can include a tenure variable that shows whether social renting has lower odds of housing insecurity relative to private renting.

requires omission of the first year of observations; the time frame used for estimation is therefore 2002–2009. A positive estimated coefficient on the lagged underemployment variable suggests that there is a scarring effect such that an experience of underemployment impacts on housing insecurity, beyond the current time period (in this case year/wave). If the estimated coefficient attached to the contemporaneous underemployment measure is also positive, there is evidence indicating that episodes of underemployment that endure over two successive years have a larger impact on housing insecurity than an isolated single episode of one year. If the coefficient attached to the lagged variable is smaller in size, the effects of underemployment decay. [20]

Our control variables include measures of household composition, the presence of children, education, receipt of income support, presence of a health condition, age, residential location in a major city, continuous measures of the proportion of income spent on housing costs and income volatility. Detailed definitions of all variables are listed in Table A3 of the Appendix. But the measure of income volatility deserves more comment. Our chosen measure is the coefficient of variance of household's equivalised disposable income—that is the ratio of the standard deviation to the mean over the period 2001–2009. It will reflect how capricious the income stream of responsible adults is relative to his/her average income over the period. An income stream that jumps and falls unpredictably, but where the deviations are small relative to a high average income, poses fewer threats to payment arrears and payment risk, as compared to the same unpredictable pattern but with respect to a lower average income. The coefficient of variation captures these ideas about volatility.

In modelling the relationship between underemployment and housing insecurity we employ both random and fixed effects regression models (for more detailed explanation see Wooldridge 2009; Allison 2009). Random and fixed effects models both belong to a class of regression models that are suitable for panel data. A particular problem specific to panel analysis is serial correlation of the errors belonging to repeated responses of the same individual across time, and is due to unobserved heterogeneity. When you have repeated responses for the same individual an ordinary least squares (OLS) regression analysis assumes independence between each observation. When extending the analysis to a panel data structure where there are multiple observations for the same individual or household, the assumption of independence is no longer valid. The key point here is that unmeasured factors affecting an individual's vulnerability to payment arrears (insecurity) will likely affect all the observations recorded for that individual, so that the error in a regression model will be correlated across observations belonging to the same person. The problem is compounded if the unmeasured factors are correlated with the measured variables (gender, age, employment and so on) that we believe determine payment arrears and payment risk status. Simply applying ordinary least squares regression models to a pooled dataset, without making an allowance in the estimation method for correlation in the errors and omitted variables, results in inefficient and biased coefficient estimates.

As an aid to understanding possible estimation solutions, consider the simple linear model (equation 1) with an unobservable fixed effect a_i where i represents the individual and t the year/wave.

$$y_{it} = \beta_1 x_{it} + a_i + u_{it} \qquad\qquad (1)$$

If a_i is correlated with the explanatory variable x_{it}, β_1 will be biased. An approach that addresses this problem involves averaging equation (1) over time, so that

$$\bar{y}_i = \beta_i \bar{x}_i + a_i + \bar{u}_i \qquad\qquad (2)$$

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[20] A richer analysis is possible on adding variables that are lagged two or more years. But each successive lag requires omission of one year of observations, thereby reducing degrees of freedom. As the HILDA panel survey matures the use of more sophisticated lag structures becomes more feasible.

where bars denote averages/means; so, for example, $\bar{y}_i$ is the average income of individual i calculated over $t = 1,2..T$ waves . On subtracting equation 2 from equation 1 we obtain

$$y_{it} - \bar{y}_i = \beta_i(x_{it} - \bar{x}_i) + u_{it} - \bar{u}_i \tag{3}$$

The left-hand side dependent variable in equation (3) is the time de-meaned data on y. Equation 3 is a fixed effects (FE) transformation (or within transformation), and pooled estimation by least squares or maximum likelihood is called a fixed effect estimation. The fixed effects estimator solves the problem of omitted (time invariant) variables as the unmeasured a_i is deleted by the transformation. But u_{it} nevertheless needs be uncorrelated with $x_{it} - \bar{x}_i$ in all time periods to ensure unbiased estimates. Measured variables that are constant over time are also swept away by the transformation.[21]

If a_i is uncorrelated with x_{it} FE transformations are inefficient. Equation (1) can now be expressed as a random effects (RE) model in which the error term has two components $(a_i + u_{it})$. But pooled estimation by OLS will result in incorrect standard errors and t-statistics because the composite errors $\vartheta_{it} = a_i + u_{it}$ are serially correlated due to the presence of a_i.

RE estimation is a Generalised Least Squares solution to this serial correlation problem that transforms equation1 by subtracting a fraction λ of the time averages $\bar{y}_i, \bar{x}_i, \bar{\vartheta}_i$. This approach differs from FE because the fraction λ is a function of the variances of the disturbance term u_{it} (σ^2_u) and the random but person-specific error a_i (σ^2_a). The fraction used in the transformation allows time invariant explanatory variables to remain part of the model specification, thus allowing us to estimate the effect of variables such as sex. This is an advantage of RE over FE estimation methods.

While RE is attractive from this perspective, an important motivation for using panel data is that it allows us to more effectively address the problems posed when unobserved time invariant effects are correlated with the explanatory variables. Estimation of RE, FE and pooled OLS can be informative about how different transformations affect the coefficient estimates. The same principles of fixed and random effects outlined for linear regression can also be applied when dependent variables, such as payment arrears and payment risk, take the form of a binary rather than a continuous measure and modelled using a logistic regression formulation (for details see Allison 2009).

While logistic regression models with both random and fixed effects have been estimated, in this section we report the findings from random effects models (results obtained on the estimation of fixed effects models are presented in Tables A1 and A2 in the Appendix). It turns out that key findings are consistent across the two sets of model estimates.[22] For ease of interpretation, the coefficient estimates have been converted to odds ratios. This is a common and intuitively appealing transformation. When the predictor variable is dichotomous—for example, a variable such as household moved that indicates whether the individual's household moved house between one year and the next—the odds ratio is the odds of event occurrence (say payment arrears) when a person moves relative to the odds of event occurrence when a person continues to reside in the same dwelling. The odds ratio is then a measure of how likely movers are to fall behind on housing payments relative to non-movers (the reference group). If the odds ratio is 2, movers are twice as likely to slip into payment arrears as non-movers. If the odds ratio is 0.5, movers have odds of payment arrears that are one-half those of non-movers. An odds ratio of 1 is then a critical threshold. Ratios above 1 reveal a higher risk of payment arrears (risk) relative to the reference group, and those below 1 indicate a lower risk relative to the reference group. For a continuous variable the odds ratio is

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[21] But they can be included by interacting with variables that change over time, if there is good reason to believe in interaction effects.

[22] All models were estimated in Stata 11 using the xtlogit command with the conditional fixed effects likelihood function and random effects function on a person-period dataset.

defined with respect to a one unit increment in the continuous variable. For example, if income is a variable in the model and a unit increase is $1000 the odds ratio is the odds of event occurrence (say payment arrears/insecurity) when a person's income is $1000 higher relative to the odds of event occurrence holding income constant.

4.2   Findings: rental insecurity

We begin by considering tenants in private and social rental housing and their susceptibility to rent arrears and rent payment risk. Table 37 below lists descriptive statistics for socio-economic, demographic and location characteristics commonly associated with housing insecurity, and calculated using the sample employed in estimating our models of housing insecurity. The typical socio-economic variables are augmented by our household employment categories and hours deficiency measure. The units of measurement and variable definitions are presented in Appendix A, Table A3. A key feature of the table is its use of a pooled sample of observations (person periods) to measure the incidence of arrears and payment risk. In aggregate rent arrears is present in 16 per cent of all observations, but is somewhat higher (at 17%) when renting privately than when renting from a social landlord (12%), which may potentially be due to the higher use of Centrelink direct rental payment debiting for social renters compared with private renters. On the other hand, our rent payment risk measure occurs more frequently, at 20 per cent of all observations; it is slightly higher (at 21%) when renting socially than when renting from a private landlord (20%). The occurrence of arrears and payment risk is particularly high among underemployed single earner households and unemployed without other earners households. The shortfall in hours of employment compared to adequate levels of employment is likely to be important because the hours deficit variable is nearly twice as high in observations of arrears and payment risk. Thus, if under (un)employment is present in a household, arrears and payment risk occurs more frequently, but it is accentuated if household labour supply falls well short of adequate levels of employment.

Table 37 below shows that rent arrears and rental payment risk is also associated with other household and personal characteristics. Couples and sole parents with dependent children are over represented in observations featuring arrears and payment risk. Though eligibility for an income support program is a passport to Commonwealth rent assistance and public housing, the principal forms of housing assistance available to tenants, it does not seem to buffer clients of these programs against housing arrears and payment risk. Of relevance here is the finding that average rent-to-income ratios are higher when a household is in arrears or prone to payment risk. The young appear to be especially vulnerable to arrears and payment risk, as are those with a health condition and lower educational status, particularly if living in inner regional areas. These other household and personal characteristics could be over-represented among the underemployed; for example, young people with a health condition are prone to fall into rent arrears, and they might also tend to be underemployed. Is their vulnerability to rent arrears due to high medical expenses and the 'immaturity of youth', or is it due to their underemployment?

Table 37: Descriptive statistics for renter insecurity models, pooled observations of responsible adults HILDA 2001–2009 (column % unless stated otherwise)

	Rental payment arrears	No rental arrears	Rental payment risk	Low rental payment risk	All renters
Household hours deficit (mean)	7.8	4.2	7.7	4.11	4.8
Adequate multiple	18.8	27.9	10.5	30.7	25.7
Underemployed multiple	9.6	6.6	5.6	7.5	6.9
Adequate single	32.4	31.8	26.6	33.4	32.1
Underemployed single	9.3	4.8	9.9	4.4	5.5
Unemployed with earners	4.3	2.9	3.8	2.9	3.0
All NLF	17.2	21.7	33.2	17.4	21.5
Unemployed without earners	8.3	4.2	10.3	3.5	5.08
Couple without child	17.1	25.7	15.0	26.6	23.2
Couple with dependent child	29.1	20.9	28.0	21.0	21.7
Couple independent child	1.3	1.8	1.7	1.7	2.0
Lone parent dependent child	12.0	7.3	18.3	5.7	7.7
Lone parent independent child	1.6	1.7	1.9	1.6	1.7
Lone person	23.9	28.3	21.5	28.5	27.1
Group	4.9	5.2	3.5	5.6	5.8
Multi family	10.0	9.19	10.1	9.2	10.8
Receives income support	42.6	35.3	61.2	30.3	36.9
Has health condition	30.8	26.4	38.0	24.5	27.8
% rent to equivalent disposable income (mean)	42.2	35.7	51.4	33.1	37.1
Coefficient of variance of household income	39.8	37.5	38.3	37.0	38.1
Age 34 years and below	55.2	48.9	44.8	50.9	50.6
Age 35–44	25.2	19.6	25.5	19.5	19.9
Age 45–54	12.5	13.9	14.9	13.4	13.5
Age 55 and over	7.16	17.6	14.8	16.1	15.9
Major city	61.5	65.0	59.3	65.6	64.7
Inner regional	26.1	21.3	28.6	20.6	21.2
Outer regional	10.7	11.4	10.7	11.4	11.6
Remote	1.6	2.0	1.1	2.1	2.1
Very remote	0.2	0.3	0.2	0.3	0.4
Bachelor and above	11.9	21.5	8.3	23.0	18.8
Ed. Diploma/certificate	32.2	28.2	29.9	28.6	28.6
Ed. year 12	19.9	18.0	16.7	18.3	18.6
Ed. year11	36.3	32.3	45.1	30.0	34.0
Moved	43.5	39.8	41.6	39.9	41.7

Source: HILDA release 9

Modelling housing insecurity measures can help unravel these confounding influences. Table 38 below reports estimates of odds ratios for four models. Models 1 and 2 share the same measure of housing insecurity—rent arrears—but Model 1 only employs the household employment typology to gauge whether inadequate employment in a household affects the chances of falling behind with rent payments. The omitted reference group is the adequately employed multiple earning household. Model 2 replaces this series of dummy variables by interactions between the household employment categorical variables and our measure of the shortfall between hours of labour supply and an adequate number of hours.[23] This second model offers a more nuanced understanding of how inadequate employment can affect vulnerability to housing insecurity. Models 3 and 4 repeat this experimentation with and without interactions by replacing the rent arrears with the rent payment risk dependent variable. In all four models there are the same extensive range of control variables, and odds ratio estimates are also listed for these controls.

Table 38: Random effects logistic regression model of rental housing insecurity and household employment, pooled observations of responsible adults HILDA 2001–2009[1]

	Rent arrears				Rent payment risk			
	Model 1		Model 2		Model 3		Model 4	
	Odds ratio		Odds ratio		Odds ratio		Odds ratio	
Underemployed multiple	2.044[.243]	***			1.78[.228]	***		
Adequate single	1.332[.140]	**			2.634[.273]	***		
Underemployed single	2.680[.387]	***			6.277[.866]	***		
Unemployed with earners	1.955[.322]	***			2.860[.465]	***		
All NLF	1.347[.196]	*			7.804[1.047]	***		
Unemployed without earners	1.852[.293]	***			7.437[1.103]	***		
Underemployed multiple * hours deficiency			1.032[.006]	***			1.012[.006]	*
Underemployed single * hours deficiency			1.031[0.005]	***			1.041[.005]	***
Unemployed with earners * hours deficiency			1.016[.005]	***			1.015[.005]	***
Unemployed without earners * hours deficiency			1.009[.004]	**			1.031[.003]	***
Adequate single			1.067[.094]				1.440[.123]	***
All NLF			1.029[.129]				3.657[0.414]	***
Couple with dependent child	1.587[.174]	***	1.673[.183]	***	2.144[.232]	***	2.446[.263]	***
Couple independent child	1.611 [.470]		1.607[.469]		1.278[.353]		1.198[.335]	
Lone parent dependent child	1.427[.223]	*	1.652[.251]	***	2.608[.372]	***	3.813[.535]	***
Lone parent independent child	1.299[.403]		1.475[.455]		1.562[.407]		2.181[.567]	**
Lone person	1.167[.142]		1.350[.156]	**	0.666[.076]	***	.944[.104]	
Group	1.062[.204]		1.048[.203]		1.127[.217]		1.173[.225]	
Multi family	1.134[.155]		1.064[.147]		1.517[.202]	**	1.541[.206]	***
Receives income support	1.642[.135]	***	1.702[.139]	***	2.172[.162]	***	2.516[.187]	***

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[23] Note that these interactions are defined conditional on a shortfall in hours. Thus single adequately employed and unattached categorical variables are left as in model 1.

	Rent arrears				Rent payment risk			
	Model 1		Model 2		Model 3		Model 4	
	Odds ratio		Odds ratio		Odds ratio		Odds ratio	
Income volatility (coefficient of variance)	1.002[.002]		1.002[.002]		1.005[.002]	**	1.006[.002]	**
Social rental	.645[.077]	***	.654[.078]	***	0.428[.044]	***	.443[.046]	***
Has health condition	1.594[.125]	***	1.615[.127]	***	1.519[.112]	***	1.566[.116]	***
Rent as % of equivalised income[2]	1.010[.001]	***	1.010[.001]	***				
Age 34 years and below	4.430[.690]	***	4.199[.652]	***	1.650[.217]	***	1.431[.189]	**
Age 35–44	3.795[.613]	***	3.640[.587]	***	1.975[.273]	***	1.677[.231]	***
Age 45–54	2.700[.441]	***	2.603[.424]	***	1.545[.213]	**	1.377[.189]	*
Major city	.961[.077]		.962[.077]		1.121[.086]		1.092[.084]	
Ed. Diploma/certificate	2.548[.319]	***	2.612[.327]	***	3.034[.382]	***	3.184[.402]	***
Ed. year 12	2.309[.312]	***	2.416[.326]	***	2.696[.366]	***	2.908[.396]	***
Ed. year11	2.695[.355]	***	2.794[.368]	***	4.112[.531]	***	4.530[.589]	***
Household moved	.903[.055]		.902[.055]		1.183[.069]	**	1.181[0.069]	**
LR chi2	538.43	***	529.58	***	1225.81	***	1138.38	***
P	.529[.016]		.528[.016]		.499 [.015]		.506[.015]	
Number of obs	18,741		18,658		18,913		18,826	
Number of adults	5,649		5,642		5662		5654	

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

[1.] The omitted categories from the polychotomous categories are adequately employed multiple earners, private renters, couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

[2.] Rent as a % of equivalised income is not included in models 3 and 4 because paying more than 30 per cent of equivalised disposable income in housing costs is one criterion used in the housing payment risk measure.

Source: HILDA release 9

First we consider the impact of underemployment in all four models, and then discuss the significance of other individual and household characteristics. Models 1 and 2 confirm that households with inadequate employment (unemployment or underemployment) have statistically significantly higher odds of being in rent arrears. Equally important is the magnitude of this impact. We find in Model 1 that the single underemployed household is nearly three times (2.7, p<0.001) more likely to fall behind with rent payments as compared to the adequately employed multiple earning household. Underemployment remains important in the presence of other earners in the household, with odds twice (2.0) those of their adequately employed multiple earning counterparts. The size of these odds ratios is intriguing because they are higher than for households where unemployment is present with no wage earners (odds ratios of around 1.9). Finally, we note that those with no adult in the labour force are somewhat more liable to fall behind on rent payments, but the size and statistical significance of this elevated risk is much lower than among inadequately employed households.

Model 2 confirms that households with underemployment present are more prone to rent arrears than other inadequately employed households, even when using a more sophisticated hours-based measure of labour deficiency. With every one hour increase in hours of labour deficiency, the odds of falling into arrears increase by 3 per cent, regardless of whether other earners are present in the household. The odds of rental arrears increase with a one-hour rise

in labour deficiency for households with unemployed persons living with employed persons, but not as steeply as for households with underemployment present.

Now consider Models 3 and 4 where rent payment risk is substituted for rent arrears as the dependent variable. While odds ratio estimates confirm the importance of underemployment, there are some important differences in emphasis. First, note that of all the household employment types, the all NLF type has become the most vulnerable on this alternative measure of housing insecurity. It seems that while this group compare rather unfavourably in terms of indicators such as paying more than 35 per cent of income in housing costs, they are willing and/or better able to manage housing payments without falling into arrears. Because they have no earnings, this group are entirely reliant on income support payments (ISPs) and savings. ISPs are probably a less volatile income stream than earnings, particularly if the all NLF group would typically take insecure forms of employment if they had jobs.[24]

The second marked difference in findings is the importance of unemployment relative to underemployment. The odds ratios of all NLF and unemployed without earner household types are 7.8 and 7.4 respectively; so these household types are much more prone to housing payment risk than the adequately employed multiple earner household. But in addition their odds ratios are higher than those of the single (6.3) and multiple earner (1.8) household with underemployment present. There is a change in the ranking when the hours deficiency measure is interacted with the household employment categories in Model 4. Underemployment remains relatively unimportant in multiple earner households, but a marginal increase in hours deficiency seems to be particularly important for the underemployed single earner household, which now becomes more prone to housing payment risk than either of the two unemployed household types.

Next we consider the influence of other individual and household characteristics in Models 1 to 4. The presence of dependent children seems to be an important demographic dimension affecting housing insecurity. The pressing spending needs associated with child rearing responsibilities are presumably driving this result. Household types where children have never been present or those where children have 'flown the nest' are not especially prone to housing insecurity on either measure. These are particularly noteworthy findings because they suggest that it is the capacity of the household to generate sufficient hours of work, which is often shaped by the constraints of caring for young children, that exposes vulnerable household types (e.g. sole parents) to rental insecurity. It is then unsurprising to find that lone parent households are over-represented among the single underemployed (accounting for 20 per cent of the single underemployed compared to 6 per cent of the total population sample of lone parent households). Measures to lower barriers impeding labour market participation are then of particular importance to this demographic group (see Chapter 5 for further discussion).

A second important demographic characteristic is age; the young are more vulnerable to housing insecurity according to both measures. But it is most clear cut with respect to rent arrears where we find that those under 35 years of age have odds of falling behind on rent payments that are more than four times the odds of those over 55 years of age. The higher savings that older renters have been able to accumulate over the life course are a likely explanation, as they are a buffer that households can fall back on in emergencies. Those without a year 12 education and no post-school qualifications have significantly higher risk of housing insecurity regardless of the measure of insecurity we model. The acquisition of qualifications is a signal of credit worthiness and so we might speculate that those without post-school qualifications find it more difficult to borrow and thereby ease acute but temporary budgetary pressures. Indeed, according to the HILDA survey, 50 per cent (31%) of renters without (with) post-school qualifications are unable to raise $2000 in an emergency, an observation consistent with this hypothesis.

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[24] But we do control for income volatility in these regression models.

Finally a few comments on factors found to be generally unimportant. Our income volatility measure proves statistically significant as a determinant of housing payment insecurity, but unimportant as far as rent arrears is concerned. The same pattern is evident with respect to the household move variable. This is puzzling, as Wood and Ong (2011) find that renters' housing affordability difficulties are eased on moving as such people typically have lower rents in their new residence.

The presence of underemployment in a household has been shown to increase the risk of housing insecurity. We now ask whether the persistence or otherwise of episodes of underemployment matter. Table 39 below presents results for the random effects models containing the same vector of control variables, but replaces our household category measures of underemployment by person-based variables (see Section 1.3.2 part c for details). As explained above, the persistence and scarring effects of underemployment are captured by contemporaneous and lagged underemployment status indicator variables. With the presence of dummy variables for unemployment and not-in-the-labour-force the omitted category becomes those persons who are employed either full-time or part-time but supply adequate hours of labour. Two sets of model estimates are offered; in Model 1 the dependent variable is an indicator of rent arrears status, while Model 2 offers estimates for our alternative composite payment risk measure.

Both model estimates confirm the presence of scarring effects. The lagged underemployment variables are positive and significant, as is also the case for contemporaneous versions of the underemployment status indicator. But the contemporaneous estimates are larger, so the scarring effects do decay. In the rent arrears Model 1 specification, an individual underemployed in the current year but adequately employed in the previous year has odds of housing insecurity that are 1.9 times those of the adequately employed. If the person had been underemployed in the previous year, but adequately employed in the current year, the odds of insecurity are 1.4 times those adequately employed in the previous year. The chances of rent arrears are higher but the impact is not as important compared to the contemporaneous effect. Finally, the cumulative effects are such that a person with underemployment that endures more than one year is over three times more likely to experience housing insecurity. These cumulative effects are greater than those associated with either unemployment or not in the labour force status. The findings are similar in Model 2.

The presence of dependent children appears to make parents more vulnerable to rent arrears and payment risk, and this is consistent with model estimates reported in Table 38 above. The remaining controls are findings reported in Table 38. Those living in social rental are significantly less likely to experience rental arrears (0.6) and rental payment risk (0.4) compared with private renters. The odds of payment risk are higher among those aged between 35 and 44 years. Lower levels of education also increase the odds of both measures of rental insecurity. Households moving house in the previous 12 months are 15 per cent more likely to experience payment risk but have lower odds of arrears than those who do not move—although again, as in Table 38, the odds for arrears are insignificant. The impact of underemployment on rental housing payment arrears and risk is likely to be influenced by the household's capacity to move out of their current housing situation. Higher mobility of renters could mitigate the effects of temporary and persistent underemployment if they are able to obtain more affordable accommodation, although renters will often face difficulties accessing more affordable housing unless moving to areas with lower employment opportunities.

Table 39: Random effects logistic regression model of rental housing insecurity and the persistence of underemployment, pooled observations of responsible adults, HILDA 2001–2009[1]

Random effects	Rental payment arrears		Rental payment risk	
	Model 1		Model 2	
Underemployed lagged t-1	1.432[.136]	***	1.373 [0.129]	***
Underemployed t	1.930[.195]	***	2.276 [0.228]	***
Unemployed	1.522[.195]	***	2.794 [0.336]	***
Out of labour force	1.129[.108]		3.206 [0.283]	***
Couple with dependent child	1.720[.187]	***	2.382 [0.260]	***
Couple independent child	1.309[.361]		1.444 [0.362]	
Lone parent dependent child	1.502[.219]	**	4.925 [0.670]	***
Lone parent independent child	1.240[.357]		2.547 [0.621]	***
Lone person	1.272[.133]	*	1.287 [0.134]	*
Group	1.053[.204]		1.040 [0.205]	
Multi family	1.123[.154]		1.504 [0.202]	**
Receives income support	1.664[.138]	***	2.397 [0.180]	***
Social rental	0.631[.075]	***	0.443 [0.046]	***
Has health condition	1.545[.122]		1.482 [0.110]	***
Percentage of rent to income	1.009[.001]	***		
Coefficient of variance of household income	1.002[.002]		1.005 [.002]	**
Age 34 years and below	4.167[.631]	***	1.309 [0.169]	*
Age 35–44	3.607[.567]	***	1.626 [0.219]	***
Age 45–54	2.592[.409]	***	1.301 [0.173]	*
Major city	0.980[.079]		1.105 [0.085]	
Ed. Diploma/certificate	2.570[.322]	***	3.234 [0.415]	***
Ed. year 12	2.337[.316]	***	2.745 [0.381]	***
Ed. year11	2.699[.355]	***	4.345 [0.571]	***
Household moved in past 12 mths	0.904[.056]		1.147 [0.068]	*
Wald chi	504.21	***	1135.70	***
P	.524[.016]		0.502 [0.015]	
Number of observations			18,687	
Number of adults			5,594	

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

[1.] The omitted categories from the polychotomous categories are adequately employed multiple earners, private renters, couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

4.3 Findings: purchaser insecurity

Next we present results for the drivers of housing insecurity among purchasers—that is home owners with a mortgage, also known as mortgagors. In 6 per cent of all person-period

observations purchasers report mortgage arrears; the frequency of payment risk is slightly higher at 7 per cent of all person-period observations. In contemporary housing markets the purchase of housing is very difficult if not impossible in the absence of earnings. Given the importance of two earnings streams as a platform supporting access to home ownership, it is unsurprising to report that unemployment and underemployment is less prevalent among mortgagors. Moreover, when underemployment and unemployment is present among purchasers it is more likely, as compared with renters, to be combined with another earner in the household. Purchaser households with one unemployed or underemployed person present, but no other earners, are reported in only 1 per cent and 2 per cent of all person-period observations respectively. Purchasers who have unemployed and underemployed adults with other earners present in a respective 2 and 8 per cent of person-period observations.

Table 40 below lists the descriptive statistics for household employment category measures as well as the socio-economic and demographic variables that are, with one exception (housing equity), the same as those used in modelling renters' housing insecurity. The occurrence of inadequate employment is again associated with housing insecurity, and this association is apparent regardless of the insecurity measure. Both under (un)employment are implicated but it would appear to be more serious when there are no other earners in the household. The hours deficiency measure of employment inadequacy also offers supporting evidence; if housing insecurity is flagged in a wave, hours deficiency is more than double its value in waves where housing insecurity is absent.

In regard to demographics, there is an interesting contrast with renters where the presence of dependent children among couples was strongly correlated with housing insecurity measures but this is not the case for purchaser insecurity. It is single, group and lone parent households that are particularly vulnerable, signaling that two incomes, and the risk sharing advantages of couples, shield them from mortgage arrears and payment risk. The other demographic feature that seems to be influential is age, with the younger at higher risk than those in older aged groups. Other variables associated with a relatively high incidence of mortgage arrears and housing payment risk are income support, a health condition, income volatility (especially in relation to mortgage arrears), and the absence of post-school qualifications. Housing insecurity is more common if there is a relatively small equity stake in the home, but moves in the last 12 months do not seem to be relevant.

Table 40: Descriptive statistics for purchaser insecurity, pooled observations of responsible adults HILDA 2001–2009 (column % unless stated otherwise)

	Purchaser arrears	No arrears	Purchaser payment risk	Low payment risk	All purchasers
Household hours deficit	5.0	2.1	4.6	2.1	2.3
Adequate multiple	37.9	55.9	31.0	57.2	54.6
Underemployed multiple	11.3	8.3	10.2	8.3	8.3
Adequate single	28.8	26.9	31.1	26.6	27.1
Underemployed single	5.4	1.6	5.3	1.5	1.8
Unemployed with earners	3.8	1.9	4.4	1.9	2.1
All NLF	10.0	4.8	15.1	3.9	5.3
Unemployed without earners	2.8	0.6	2.9	0.5	0.8
Couple without child	17.6	25.8	13.6	25.9	24.8
Couple with dependent child	50.8	52.6	52.9	52.9	51.9
Couple independent child	4.2	4.4	2.9	4.5	4.7
Lone parent dependent child	7.0	3.1	10.2	2.9	3.3
Lone parent independent child	1.1	0.8	1.0	0.8	0.9
Lone person	9.5	7.9	8.2	7.7	7.7
Group	1.8	0.8	0.8	0.9	0.9
Multi family	7.8	4.7	10.4	4.5	5.8
Receives income support	23.7	10.7	32.4	9.6	11.7
Has health condition	27.9	18.1	31.5	17.5	18.9
% mortgage to equivalent disposable income (mean)	48.1	38.8	52.7	38.5	39.9
Housing equity/10,000 (mean)	16.8	25.1	14.0	24.7	24.7
Coefficient of variance	37.6	31.1	32.7	30.6	31.7
Age 34 years and below	26.0	24.9	27.9	25.4	25.20
Age 35–44	35.9	35.4	38.5	35.6	35.0
Age 45–54	27.3	26.5	23.2	26.8	26.5
Age 55 and over	10.9	13.1	10.4	12.2	13.3
Major city	61.4	63.2	56.0	63.5	63.3
Bachelor and above	18.7	29.2	13.1	29.7	28.0
Ed. Diploma/certificate	37.4	34.3	35.3	34.6	34.7
Ed. year 12	11.9	12.5	12.5	12.6	12.7
Ed. year11	32.0	24.0	39.2	23.2	24.5
Household moved	12.4	12.8	13.9	12.9	13.2

Source: HILDA release 9

In modelling the predictors of purchasers' mortgage arrears and payment risk we again include our household employment groups and the same controls as for renters, except that their housing equity stake is added. Findings are reported in Table 41 below. Models 1 and 2

analyse drivers of mortgage arrears status; the crude household employment categories capture the possible influence of inadequate employment in Model 1. Model 2 interacts these categories and our measure of actual labour supply relative to adequate labour supply (hours deficiency) with a view to establishing whether the scale of employment inadequacy matters. Models 3 and 4 follow the same sequence, but this time using our housing payment risk measure as the binary dependent variable.

The key finding is a confirmation that even after controlling for personal characteristics, including housing cost burden measures (in mortgage arrears models), employment inadequacy in the household is significantly associated with housing insecurity. Unemployment is uncommon among purchasers, but is nevertheless a statistically significant influence, with high odds ratios that are typically larger than those of equivalent households where underemployment is present. Underemployment is nevertheless important; for example, the single underemployed household has odds of falling behind on mortgage payments that are more than four times those of the dual earner household where no one is looking for additional employment (see Model 1). The extent of inadequate employment in a household counts, but an additional hour of employment that helps bridge the inadequacy gap will typically matter more to the household where no other earners are present (see Models 2 and 4). Finally, note that inadequate employment is an even more important source of housing insecurity among mortgagors that it is for tenants. This might reflect the absence of an owner occupier safety net in income support programs that could offer the support provided by Commonwealth Rent Assistance. We elaborate further on policy implications in the final chapter.

In addition to the adequately employed multiple-earner household, there are two household categories untouched by inadequate employment, that is either underemployment or unemployment. Those households where no responsible adult is in the labour force are very susceptible to payment risk, but the likelihood of mortgage arrears is modest by comparison to most households affected by inadequate employment. The adequately employed single-earner household is prone to housing insecurity even if adequately employed is further affirmation of the importance of two earnings streams. But odds ratios are modest by comparison to households touched by inadequate employment.

Next we examine the significance of other individual and household characteristics. Consider the demographic variables; dependent children did not flag housing insecurity in the descriptive statistics but they do come through once we control for other factors in the modelling, and it is especially important for lone parents. Age is important in driving the payment risk measure, with the young again prone, but this result is a weak one in relation to mortgage arrears. Indeed the incidence of mortgage arrears peaks in the 45–54 years age band. The management of housing wealth has changed in recent decades as flexible mortgages encourage owners to dip into their housing equity. Middle-aged owners seem to find this option especially attractive (Parkinson et al. 2009); the spike in mortgage arrears might well reflect this change in behaviour. While group and multi-family households are highly susceptible to housing insecurity their numbers are low in purchased housing, representing a respective 1 and 6 per cent of adult observations.

Turn now to financial variables. Those with large equity stakes in their home are less prone to housing insecurity. The odds of falling behind on mortgage payments or being exposed to payment risk declines by 1.6 per cent and 3.2 per cent respectively for every $10 000 increase in housing equity. The findings with respect to equity are consistent with previous studies examining mortgage arrears and risk. For instance, Berry, Dalton & Nelson (2010) find that recent purchasers with typically low levels of equity (and higher mortgage payments) are more likely to default on their loans. Maybe mortgagors with larger amounts of housing wealth at stake are more inclined to slash other discretionary spending items to keep up with mortgage payments, but this hypothesis requires further research. When the housing cost burden measure is a variable in the arrears model, both it and the income volatility measure are

statistically significant. It seems that unpredictable shifts in income could be more important to the arrears predicament of mortgagors than tenants. The income volatility measure is also statistically significant in both versions of the payment risk model, where the housing cost burden measure is omitted (because it is used as a criterion for judging payment risk).

Finally we turn to the other socio-economic variables. A health condition is uniformly statistically significant, lifting the odds of housing insecurity to between 47 per cent and 65 per cent (depending on the measure of insecurity) above those in good health. The inferior is educational attainment, the greater the risk of housing insecurity. This is conspicuously evident among owners that completed their schooling in year 11 and have no post-school qualifications. These owners have odds of mortgage arrears status that are twice those with a degree, and the odds ratio is even higher at around four when the payment risk measure is modelled.

Table 41: Random effects logistic regression model of purchaser housing insecurity and household employment, pooled observations of responsible adults HILDA 2001–2009[1]

	Mortgage arrears				Purchaser payment risk			
	Model 1		Model 2		Model 3		Model 4	
	OR							
Underemployed multiple	2.071[.269]	***			1.931[.268]	***		
Adequate single	1.506[.168]	***			2.240[.262]	***		
Underemployed single	4.368[.967]	***			7.562[1.760]	***		
Unemployed with earners	2.350[.493]	***			2.467[.537]	***		
All NLF	2.551[.521]	***			6.660[1.350]	***		
Unemployed without earners	9.685[3.139]	***			6.213[2.085]	***		
Underemployed multiple * hours deficiency			1.047[.007]	***			1.039[.008]	***
Underemployed single * hours deficiency			1.046[.009]	***			1.058[.010]	***
Unemployed with earners * hours deficiency			1.029[.007]	***			1.024[.007]	***
Unemployed without earners * hours deficiency			1.061[.009]	***			1.038[.010]	***
Adequate single			1.329[.141]	**			1.800[.199]	***
All NLF			2.090[.415]	***			4.789[.937]	***
Couple with dependent child	1.471[.190]	***	1.519[196]	***	2.347[.327]	***	2.421[.336]	***
Couple independent child	1.278[.298]		1.356[.316]		1.022[.279]		1.078[.293]	
Lone parent dependent child	1.929[.452]	**	2.418[.558]	***	4.121[.984]	***	5.481[1.290]	***
Lone parent independent child	1.355[.577]		1.537[.658]		1.178[.514]		1.446[.630]	
Lone person	1.368[.267]		1.592[.307]	*	1.225[.260]		1.498[.315]	*
Group	6.512[2.393]	***	6.644[2.439]	***	1.376[.721]		1.403[.730]	
Multi-family	1.777[.366]	**	1.794[.372]	**	4.375[.908]	***	4.353[.905]	***
Receives income support	1.577[.211]	***	1.632[.217]	***	2.221[.295]	***	2.424[.320]	***
Has health condition	1.474[.150]	***	1.514[.154]	***	1.608[1.169]	***	1.648[.173]	***
Percentage of mortgage to	1.016[.002]	***	1.017[.002]	***				

	Mortgage arrears		Purchaser payment risk	
	Model 1		**Model 2**		**Model 3**		**Model 4**	
	OR							
income								
Income volatility (coefficient of variance)	1.019[.003]	***	1.019[.003]	***	1.011[.003]	***	1.012[.003]	***
Housing equity/10,000	.984[.002]	***	.984[.002]	***	.968[.003]	***	.968[.003]	***
Age 34 years and below	1.466[.267]	*	1.420[.258]	*	2.259[.450]	***	2.142[.425]	***
Age 35–44	1.400[.246]	*	1.344[.235]		1.983[.382]	***	1.845[.354]	***
Age 45–54	1.542[.257]	**	1.484[.246]	*	1.463[.270]	*	1.377[.253]	
Major city	1.103[.115]		1.072[.112]		.983[.112]		.951[.108]	
Ed. Diploma/certificate	1.602[.218]	***	1.585[.216]	***	2.779[.444]	***	2.769[.441]	***
Ed. year 12	1.448[.256]	*	1.452[.256]	*	2.104[.424]	***	2.121[.426]	***
Ed. year11	2.266[.334]	***	2.269[.335]	***	4.294[.732]	***	4.323[.736]	***
Household moved	.740[.085]	**	.724[.083]	**	.946[.106]		.933[.105]	
LR chi2	505.90	***	507.42	***	671.07	***	645.88	***
P	.575 [.019]		.575 [.019]		.633 [.017]		.633[.017]	
Number of the obs	25,271		25,233		25,427		25,390	
Number of groups	6,562		6,557		6,558		6,553	

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

1. The omitted categories from the polychotomous categories are adequately employed multiple earners, couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

Our final set of random effects models, shown in Table 42 below, focus on the association between the persistence of underemployment and purchaser insecurity. As with the renter models presented earlier, the purchaser model sample is based on adults and the unit of measurement for employment variables is the individual not the household.

The mortgage arrears and mortgage risk models both confirm the importance of contemporaneous underemployment status, and these impacts are of a similar order of magnitude and statistical significance to unemployment or not-in-the-labour-force statuses in the mortgage payment risk model. However, in the mortgage arrears model, unemployment is the more sizeable influence. Furthermore, both models fail to confirm the scarring effects evident in the equivalent models estimated for a sample of renters. It could be that tenants' housing circumstances are inherently more precarious and so underemployment effects endure beyond the concurrent year.

Similar to previous models, receiving income support, having a health condition, and lower levels of education increase the odds of payment arrears and payment risk. The types of households with increased risk of payment arrears again include those living in group, multi-family, lone person, and lone parent households.

Those who move have a significantly (p <0.05) decreased risk of payment arrears by 29 per cent. This potentially indicates that owners who are unable to quickly move or sell up may be less likely to resolve financial difficulty, leading to arrears. However, our sample does not control for those who move out of home ownership between consecutive waves so there needs to be some caution in the interpretation of the results. Previous research by the authors (Parkinson 2010; Ong et al. 2013) indicates that those who move out of homeownership status are twice as likely, compared with those who remain, to have experienced arrears and financial

stress prior to moving. It is likely that the model is capturing a large proportion of voluntary movers or those 'trading up'.

Finally, age is significantly related to mortgage arrears and payment risk, although the age groups most vulnerable differ across the two measures. For purchaser arrears it is those aged between 45–55 years who have the highest odds (1.41) while for payment risk the youngest households aged 34 years or below have the highest odds, compared with the omitted group of those aged 55 years and over.

Table 42: Random effects logistic regression model of purchased housing insecurity and the persistence of underemployment, pooled observations of responsible adults HILDA 2001–2009[1]

Random effects	Mortgage arrears		Mortgage payment risk	
	Model 1		Model 2	
Underemployed lagged t-1	1.006[.149]		1.127[.167]	
Underemployed	2.097[.295]	***	2.643 [.383]	***
Unemployed	3.056[.689]	***	2.489 [0.590]	***
Out of labour force	1.351[.164]	**	2.800 [0.343]	***
Couple with dependent child	1.630[.209]	***	2.306 [0.320]	***
Couple independent child	1.475[.314]	+	1.063 [0.267]	
Lone parent dependent child	2.815[.624]	***	8.011 [1.826]	***
Lone parent independent child	1.938[.789]		2.176 [0.921]	+
Lone person	1.935[.348]	***	2.235 [0.436]	***
Group	7.377[2.702]	***	.976 [0.541]	
Multi family	2.030[.399]	***	3.858 [0.777]	***
Receives income support	1.758[.225]	***	2.327 [0.297]	***
Has health condition	1.519[.151]	***	1.612 [0.166]	***
Percentage of mortgage to income	1.016[.002]	***		***
Coefficient of variance of household income	1.021[.003]	***	1.012 [.003]	***
Housing equity/10,000	.983[.002]	***	0.968 [0.003]	***
Age 34 years and below	1.222[.216]		2.051 [0.401]	***
Age 35–44	1.234[.210]		1.932 [0.364]	***
Age 45–54	1.408[.225]	*	1.380 [0.248]	+
Major city	1.114[.115]		0.965 [0.109]	
Ed. Diploma/certificate	1.595[.216]	**	2.900 [0.465]	***
Ed. year 12	1.504[.264]	*	2.235 [0.415]	***
Ed. year11	2.315[.338]	***	4.259 [0.727]	***
Household moved	.714[.083]	**	0.895 [0.103]	
Wald chi	480.61	***	639.02	***
P	.579[.018]		0.641 [0.017]	
Number of observations	26,000		26,162	
Number of adults	6,683		6,673	

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

[1.] The omitted categories from the polychotomous categories are adequately employed multiple earners, couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

Source: HILDA release 9

4.4   A note on causality

Our models of housing insecurity in this chapter offer more convincing evidence than descriptive analysis of the impact of underemployment. Use of regression modelling allows the researcher to control for possibly confounding influences that can mask or exaggerate correlations between one variable and another. The models testify to a strong association between underemployment, included here as an independent variable, and housing insecurity. In treating housing insecurity as the outcome variable, and seeking to assess the impact of underemployment, we follow an assumption that the predominant direction of causality is most likely to flow from the labour market to the housing outcomes. This is a plausible assumption, which draws on the fact that underemployment is linked to factors such as low personal and household income, variable income and other dimensions of labour insecurity, which could be expected to act as causal mechanisms in determining housing outcomes.

Our focus in this research has been to examine the relationship between measures of underemployment/labour deficiency as a predictor of housing insecurity rather than examining the reverse relationship in full detail. The descriptive analysis in Chapter 2 revealed several potential mechanisms by which underemployment may increase the chances of experiencing housing insecurity. There is a strong descriptive association between more insecure forms of employment and underemployment suggesting that volatility in hours may be influential. A further potential mechanism could be via the lower overall household income of the underemployed compared with households who are adequately employed. It is likely that the effect of household income is mitigated or exacerbated by overall housing costs. Moreover, underemployment appears to be disproportionately concentrated in certain types of vulnerable households, such as a single-earning households who, without a second earner, may find it more difficult to meet housing costs.

As we noted in passing in Chapter 3, the causal relationship between employment status and housing insecurity can, however, be multi-directional. It is theoretically plausible that high housing costs relative to income or financial stress may prompt those with part-time hours to express the desire for more hours and thus fall into the category of underemployed. That housing insecurity might be a cause of underemployment is an intriguing hypothesis. It might help explain the rising rate of underemployment in Australian labour markets. Increases in real rents and house prices during the 1990s and early 2000s have subsequently slowed, but remain at very high levels that squeeze living standards given the importance of housing payments in the average household budget. The rapid climb in housing costs over this period correlates with the increase in underemployment; there will surely be labour market factors at work. But housing is a necessity that most households will work harder to acquire when secure accommodation is threatened.

Investigating the reverse relationship that might connect increasing housing costs and underemployment is beyond the scope of the current research, though it is undoubtedly warranted, particularly at a macro level. As a small step in the direction of analysing the reverse relationship, we estimated, using fixed effects models, whether housing costs and arrears in the year preceding underemployment predicted the move into underemployment among our sample of responsible adults. The results for the housing measures were insignificant (see Table A4 in Appendix). This finding provides some support for the notion that the dominant direction of causality is from underemployment to housing insecurity rather than the reverse.

4.5   Conclusion

Underemployment is a statistically significant influence in the regression models. It seems to be particularly influential in exposing private rental tenants to housing insecurity (whereas inadequate hours of employment due to unemployment are relatively more important in shaping purchasers' vulnerability to housing insecurity). How far hours of employment fall short

of adequate levels is an important factor. For renters, but not mortgagors, we also detect scarring effects from experiences of underemployment in the previous year. We may therefore conclude that the persistence of underemployment is relevant for tenants' exposure to housing insecurity. The models also offer a broader picture of those particularly vulnerable according to our measures of housing insecurity. They are those with a health condition, those with dependent children, those with an acute housing cost burden, the young, the single (particularly lone parents) and those with no post-school qualifications. The young with dependent children and housing costs that take a relatively high share of income are especially vulnerable if renting. Owners are particularly prone if they have a small equity stake in their homes.

5 POLICY IMPLICATIONS AND FUTURE RESEARCH DIRECTIONS

The research findings reported in previous chapters show that underemployment is an important labour market phenomenon that is linked to housing insecurity. This chapter turns to our final two questions:

→ What might be the policy implications of these research results?

→ What might be the implications for further research?

5.1 Implications for policy

Public policy aims to reduce poor housing outcomes such as housing insecurity. It is well-known that poor housing outcomes may be linked with labour market conditions, but much of the attention in policy debates has so far been devoted to the link with unemployment or joblessness in general. Our results lay down a different, broader challenge, which suggests that it is also necessary to pay attention to the link between underemployment and housing insecurity.

At least two possible directions for policy reform can be distinguished. The first approach treats the issue as primarily a labour market problem and designs measures that make it easier for the underemployed to obtain more hours of work, either in the same job or through a second job. This could involve either direct measures at the workplace or indirect measures that support workforce participation. For example, because child care issues may make it more difficult for lone parents to combine two part-time jobs, improving child care support for working lone parents could be a measure with potential to improve conditions on the labour market side. Alternatively, we might regard the housing insecurity of the underemployed as primarily a housing policy issue that should be addressed through housing reforms that target the underemployed. For example, we might conclude on the basis of our findings that existing housing assistance measures are inadequate because large numbers of the underemployed are evidently falling through the housing assistance 'safety net '.

Labour market policy solutions were canvassed in the recent Inquiry into Insecure Work (Howe et al. 2012). The Inquiry identified critical links between the security of employment and the capacity to gain access to and sustain secure housing. Many of the recommendations would, if implemented, have flow-on effects in the housing market. Of particular relevance are those recommendations aiming to increase the stability of earnings for employees through a set of minimum standards for all workers, including enhanced entitlements and clearer definitions for casual employment. Other recommendations that are likely to help household incomes of underemployed workers include the need for improved income transfers through family tax benefits and tax offsets. More wide-ranging welfare reforms to increase personal income protection were also considered. Social security built around a national employment insurance scheme administered alongside and linked to an individual's superannuation is one option (Howe et al. 2012, p.49). In 'favourable' times, funds accumulate in the insurance scheme as workers and their employers contribute; the funds can then be drawn down if employment circumstances deteriorate.

A central theme emerging from the Inquiry is the need to develop social policies that better reflect contemporary, more fragmented labour markets. There is a need for new policies that are sufficiently fluid to accommodate the critical work-life transitions where vulnerability and the need for assistance are most acute. This idea builds on the work of Günther Schmid, who argues that policies must consider the needs associated with key transitions, such as between education/training and employment, between family-based activity and employment, between unemployment and employment, between periods of incapacity and employment, and from employment to retirement (Schmid 1995; Schmid & Schömann 2003; Howe et al. 2012, p.42).

Housing assistance measures may need to be reformed to adapt to the new structure of labour markets. Rising underemployment and associated forms of insecure employment are, through their contribution to housing risk, helping the emergence of a more fluid housing market. The once standard housing career of leaving the family home as a young adult, purchasing a property and then progressing through to outright ownership in or near retirement is no longer realisable for many Australian households. Churning on the edges of home ownership is now more commonplace in Australia, but our housing policy approach remains wedded to the linear housing careers of the 20th century. We continue to focus on measures promoting first home ownership, while targeting indirect subsidies on older higher-income owners. Meanwhile social housing remains a residual tenure, offering last resort but more stable housing opportunities for those with acute needs. The position of those on the margins of ownership remains largely neglected.

There are signs, however, of a shift in thinking on housing policy. Housing policy reforms are beginning to reflect the need to support households through critical transitions that are linked to fluctuating incomes and housing support needs. For example, the recent policy goal of increasing tenant flows through social housing rather than offering 'tenure for life' is symptomatic of this policy shift. However, our research does confirm the fundamental role that social housing plays in reducing insecurity for those with inadequate and uncertain earnings. The high rate of rent arrears in the private rental market among those with inadequate earnings is a sign that moves from social housing into the private rental sector can be troublesome and could prove to be a revolving door back into public housing. Older workers and women with children, especially those employed in casual jobs, will be particularly vulnerable to changing work conditions and may thus find themselves struggling in the private rental market.

The need to address the adequate supply of low cost housing through initiatives such as the National Rental Affordability Scheme (NRAS) remains an obvious priority in alleviating the housing cost burden for those with inadequate earnings. We do not propose further solutions to addressing ways of increasing the supply of affordable housing, as these have been adequately outlined by others (Berry et al. 2004; Wood et al. 2008; Milligan et al. 2009). Instead our focus here is the capacity of specific forms of housing assistance to help underemployed households in their efforts to increase and stabilise income and to overcome difficulties in meeting housing payments. The current forms of housing subsidy based assistance are Commonwealth Rent Assistance (CRA), other forms of rental payment assistance that provide a one-off payment for recipients, and home purchase assistance, which provides mortgage relief, interest rate protection, and some specifically targeted support for those accessing home ownership for the first time. With the exception of CRA, the amounts and types of housing payment assistance are determined by state governments and hence vary across states and territories (AIHW 2012). The various programs are typically small in scope. The policy implications associated with each source of housing assistance will be discussed in turn.

5.1.1 Commonwealth Rent Assistance

Commonwealth Rent Assistance (CRA) represents the largest form of housing related income support for private renters, providing support to approximately 1.1 million income units at 30 June 2012 (AIHW 2012, p.34). The budget cost in the fiscal year 2011–12 was more than $3.3 billion (SCRGSP 2012, p.G.7). Commonwealth Rent Assistance has been the subject of extensive debate and review over the years. However, there is a common view among housing researchers that, though providing some relief from housing affordability stress, it neither prevents housing insecurity nor stimulates an adequate supply of affordable housing (see Hulse et al. 2012; Burke et al. 2011). A significant proportion of renters remain in housing stress even after receiving CRA, with single-headed households experiencing the greatest rental stress (AIHW 2012, p.35).

Our research confirms the need for reforms to improve the efficiency and equity of CRA. In particular, more consideration needs to be given to the housing cost burdens of those who are living in underemployed single-earner households and are commonly ineligible for the government income support that acts as a passport to CRA. The high rate of arrears, especially among single underemployed households, reveals critical problems associated with cash flow. One difficulty that underemployed workers face, particularly those with more volatile incomes, in being able to meet their housing payments is the timeliness of income support when they are not currently registered recipients for a regular Centrelink payment. While many part-time workers combine paid part-time work with income support, workers not in receipt of benefits can be left with no income at all if their paid hours are intermittent (Howe et al. 2012). Moreover, unlike many of their unemployed counterparts, underemployed workers are unlikely to receive compensation in the form of redundancy packages if their hours are suddenly reduced.

Not all underemployed workers will require ongoing income support because they can rely on the incomes of other employed household members or may earn enough to tide them over during short episodes of underemployment. However, there will be a sizable group, particularly among the single underemployed households, who will need more rapid access to an income supplement to meet urgent housing costs. To this end there is a need for more tenure-neutral income support related housing policies that are tied to the amount and stability of income within a household rather than whether they are a renter or purchaser. The formula for assessing eligibility for ongoing housing assistance or more specific time-limited assistance needs to be based on affordability thresholds that can better accommodate fluctuations in earnings from week to week, especially for those who are not registered Centrelink recipients.

5.1.2 Rental payment assistance

Rental payment assistance is offered by some state governments, and it remains small in scope relative to CRA. How this type of housing assistance is delivered and its eligibility varies across states. In the fiscal year 2010–11, a total of $152.1 million was spent on rental payment assistance delivered to approximately 126 000 households across Australia (AHIW 2012, p.36). Rental payment assistance is typically targeted to those who experience difficulties in gaining access to rental accommodation because they cannot raise a rental bond, or have fallen into arrears, thereby threatening the security of their current rental property. Assistance for arrears or housing crisis is administered via community welfare organisations; eligible recipients can receive a one-off payment over any one twelve-month period. For example, the Victorian Housing Establishment Fund (HEF) provides up to $300 a year to a person in need. A systematic review found that the program delivered significant and valuable benefits for tenants, but it also noted that the program's effectiveness could be enhanced if payments were extended over longer periods to better stabilise households through a crisis (Jacobs et al. 2005). The provision of such support is unlikely to prevent housing loss among those with more chronic arrears and ongoing constraints to income. While the program is accessible for those in paid work, it is unlikely to provide sufficient relief where incomes vary unpredictably and often. Nonetheless, the expansion of such programs should be considered.

5.1.3 Home purchase assistance

Targeted home purchase assistance provides assistance to lower income groups seeking to access home ownership for the first time. It commonly takes the form of loans to help bridge deposit requirements, or shared equity loans that help lower ongoing mortgage payments. It can also provide interest rate assistance and mortgage relief for those experiencing hardship (AIHW 2012). Again the implementation and eligibility rules for this kind of mortgage assistance differ across states and territories. The mortgage relief component of the program is small in scope, with a total of 758 households in NSW, Victoria, Qld, WA, and the ACT receiving mortgage relief in 2010–11. Interest rate protection was delivered to a further 19 928 households in WA and SA (AIHW 2012, p.38).

There are large differences in home purchase assistance across states. Mortgage relief is typically provided in the form of an interest free loan that must be paid back after a set period. It is designed to assist those who have experienced a sudden but temporary change in their circumstances, such as unemployment, sickness, or separation and divorce. Eligibility is typically defined according to an affordability threshold defined by mortgage payments as a percentage of income. A cap is set on eligible house values. While the introduction of mortgage relief is a welcome policy direction, a loan that adds to existing mortgage debt may prove difficult for the inadequately employed to repay, especially those who remain persistently underemployed or who have limited scope for increasing earnings within their household.

5.2   Implications for future research

This is the first comprehensive study using national data to examine associations between household underemployment and housing insecurity. Many new research questions have emerged from this research that were not within the scope of the current study.

One implication of the research is the need to improve data measures for both underemployment and housing insecurity. The data available on housing arrears remains problematic. There is a critical need to collect more robust measures of housing insecurity that can be monitored over time. There needs to be greater access to arrears data for rental properties and for purchased housing. Moreover, there needs to be better measures of labour underutilisation and insecurity that can be examined alongside arrears and other measures of housing insecurity. Cross-sectional surveys such as the Survey of Income and Housing Costs (SIHC), which is often used to monitor housing affordability trends, could be enhanced by extending labour market categories to incorporate measures of underemployment, and other dimensions of labour insecurity such as those examined in this report.

In our research we succeed in analysing the link between underemployment and housing security, showing how this is influenced by the composition of the household and forms of housing tenure. We demonstrate through our modelling that this link holds when taking account of background factors. But much remains to be done in teasing out the direction of the causality. Panel microdata sets such as HILDA offer an opportunity to explore more closely the dynamics of this relationship.

We identify possible mechanisms of causality linking underemployment and housing insecurity, such as volatility of hours, the correlation with other forms of labour insecurity and the depressive impact of low hours (and low wages) on household income. However, to determine which factors are most important, and under what circumstances, would require a judicious combination of quantitative and qualitative research.

We are not able in this research to resolve the important issue of 'thresholds' or 'tipping points' where underemployment exercises a severe impact on individuals or households, thereby establishing both the rationale and the site for policy intervention. Determining a threshold requires an assessment of both the intensity of underemployment and its persistence over time. We acknowledge that the relationship between underemployment and housing insecurity is likely to be non-linear. We identify one path forward, which is to use a household measure based on bands of weekly hours that are in deficit within households (see Table 24 and Figure 7). This has the virtue of combining unemployment and underemployment. Similarly, we begin an analysis of persistence through a matrix of transition probabilities (see Table 18). However, a full examination of both aspects would require a combination of quantitative and qualitative research.

The link between underemployment and other dimensions of labour market insecurity is an important relationship demanding further investigation. Inadequate employment hours are a cause of low income, while job insecurity can be the source of volatile and intermittent earnings profiles. Underemployment's impact on housing insecurity is likely to be greater when joined by

one or more dimensions of job insecurity. Measurement of these interaction effects deserves attention.

In-depth qualitative research examining what happens to households during a period of underemployment, including how they seek to resolve their housing difficulties, would greatly add to our understanding of the ways underemployment may differ or align with the experience of unemployment. A critical component of this type of inquiry would be to examine the factors shaping a household's need and decision to work more hours, including the role that housing cost burdens may play in the collective labour supply of household members.

There is also a need to extend the scope of research. In our research project we focus on supplementing the conventional approach oriented to analysing joblessness by incorporating underemployment. There is a good case for extending the analysis further to look at groups such as the potential labour force (the 'hidden unemployed'), who are also omitted in the conventional approach but who may be marginally attached to the labour force and may also desire paid work. Even within the group of underemployed persons, we focused in the main body of this Final Report on a majority group deemed to be responsible for housing payments. This required setting aside non-dependent children within the household, though this group had a high incidence of underemployment. This is a group that should be incorporated into the analysis of housing outcomes.

Finally, we can note that this Final Report compares underemployment, both at the individual and at the household level, with adequate employment on the one hand and unemployment on the other hand. We show that underemployment, like unemployment, is associated with a higher risk of housing insecurity. We suggest that underemployment, like unemployment, can be persistent. This moves the discussion of housing assistance policy beyond the narrow prism of unemployment or joblessness and helps to prise open the issue of the impact of contemporary labour market restructuring. More needs to be done, however, in investigating the movements in and out of these disadvantaged labour force statuses. In the light of evidence of substantial churning at the edges of contemporary labour markets, that is between short-lived adequate employment, underemployment, unemployment and NLF statuses, there may in fact be a broad group that is at risk of poor housing outcomes. Further careful research is needed to identify the size and characteristics of this broader group.

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Appendix 1

Table A1: Fixed effects logistic regression model of rental housing insecurity and household employment, pooled observations of responsible adults HILDA 2001–2009[1]

Conditional fixed effects	Rent arrears				Rent payment risk			
	Model 1		Model 2		Model 3		Model 4	
	OR				OR			
Underemployed multiple	1.563 [0.214]	***			1.195 [0.174]			
Adequate single	1.174 [0.154]				1.648 [0.217]	***		
Underemployed single	2.279 [0.388]	***			3.179 [0.524]	***		
Unemployed with earners	1.378 [0.257]				1.583 [0.291]	**		
All NLF	1.567 [0.289]	*			4.047 [0.708]	***		
Unemployed without earners	1.359 [0.253]				3.575 [0.642]	***		
Underemployed multiple * hours deficiency			1.022 [0.007]	***			0.995 [0.007]	
Underemployed single * hours deficiency			1.024 [0.006]	***			1.023 [0.005]	***
Unemployed with others * hours deficiency			1.009 [0.005]				1.001 [0.005]	
Unemployed no others * hours deficiency			1.003 [0.004]				1.019 [0.004]	***
Adequate single			.977 [0.105]				1.058 [0.108]	
All NLF			1.280 [0.201]				2.333 [0.331]	***
Couple with dependent child	1.193 [0.194]		1.230 [0.200]		1.171 [0.194]		1.293 [0.215]	
Couple independent child	0.783 [0.316]		0.743 [0.299]		0.806 [0.277]		0.703 [0.251]	
Lone parent dependent child	0.947 [0.196]		1.029 [0.228]		1.373 [0.294]		1.815 [0.380]	**
Lone parent independent child	0.914 [0.380]		.985 [0.408]		1.357 [0.472]		1.819 [0.623]	
Lone person	1.034 [0.184]		1.160 [0.197]		0.719 [0.124]	*	0.960 [0.159]	
Group	0.933 [0.255]		0.922 [0.253]		.987 [0.259]		1.108 [0.292]	
Multi family	0.931 [0.173]		0.828 [0.157]		1.043 [0.191]		1.095 [0.201]	
Receives income support	1.482 [0.147]	***	1.506 [0.150]	***	1.270 [0.116]	**	1.339 [0.122]	***
Social rental	0.785 [0.139]		0.774 [0.138]		0.383 [0.055]	***	0.378 [0.059]	***
Has health condition	1.284 [0.124]	**	1.275 [0.124]	*	1.162 [0.107]		1.163 [0.108]	
Percentage of income to rent	1.007 [0.002]	***	1.008 [0.002]	***				
Age 34 years and below	2.598 [1.052]	*	2.531 [1.031]	*	1.541 [0.773]	***	1.559 [0.554]	
Age 35–44	1.534 [0.574]	**	1.549 [0.809]		1.257 [0.397]	**	1.214 [0.384]	
Age 45–54	1.260 [0.406]		1.265 [0.410]		.930 [0.242]		.906 [0.235]	
Major city	.936 [0.142]		.962 [0.148]		1.068 [0.159]		.993 [0.148]	
Ed. Diploma/certificate	1.205 [0.401]		1.283 [0.428]		1.549 [0.509]		1.585 [0.520]	
Ed. year 12	3.661 [1.206]	***	3.884 [1.277]	***	3.059 [0.934]	***	3.357 [1.017]	***

Conditional fixed effects	Rent arrears		Rent payment risk	
	Model 1	Model 2	Model 3	Model 4
	OR		OR	
Ed. year 11	1.609 [0.627]	1.727 [0.673]	1.599 [0.608]	1.629 [0.613]
Household moved	.944 [.066]	.938[.066]	1.218 [.081] **	1.209[.080] **
LR chi2	151.70 ***	145.69 ***	256.08 ***	226.70 ***
Number of obs	5,850	5,791	6,576	6,502
Number of groups	1,191	1,185	1,292	1,284

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

[1.] The omitted categories from the polychotomous categories are adequately employed multiple earners, couple without child, private renters, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

Appendix 2

Table A2: Fixed effects logistic regression model of purchaser housing insecurity and household employment pooled observations of responsible adults HILDA 2001–2009[1]

	Purchaser payment arrears				Purchaser payment risk			
	Model 1		Model 2		Model 3		Model 4	
Conditional fixed effects	OR							
Underemployed multiple	1.735 [0.267]	***			1.635 [0.256]	**		
Adequate single	1.301 [0.189]				2.062 [0.311]	***		
Underemployed single	2.495 [0.625]	***			4.372 [1.161]	***		
Unemployed with earners	1.665 [0.386]	*			1.523 [0.372]			
All NLF	1.829 [0.506]	*			3.138 [0.832]	***		
Unemployed without earners	5.146 [2.021]	***			2.404 [0.906]	*		
Underemployed multiple * hours deficiency			1.033 [0.009]	***			1.034 [0.009]	**
Underemployed single * hours deficiency			1.023 [0.008]	***			1.040 [0.011]	**
Unemployed with earners * hours deficiency			1.017 [0.007]	*			1.007 [0.008]	
Unemployed without earners * hours deficiency			1.047 [0.012]	***			1.011 [0.010]	
Adequate single			1.052 [0.154]				1.656 [0.228]	***
All NLF			1.472 [0.384]				2.232 [0.555]	**
Couple with dependent child	1.724 [0.390]	*	1.868 [0.423]	***	1.550 [0.343]	*	1.600 [0.353]	*
Couple independent child	1.067 [0.341]		1.177[0.376]		0.637 [0.227]		0.672 [0.239]	
Lone parent dependent child	1.642 [0.594]		1.972 [0.701]	*	1.761 [0.615]		2.366 [0.808]	**
Lone parent independent child	1.369 [0.752]		1.514 [0.829]		0.557 [0.305]		0.726 [0.394]	
Lone person	1.092 [0.383]		1.242 [0.432]		1.393 [0.480]	*	1.662 [.566]	
Group	4.949 [3.176]	*	5.193 [3.295]	**	1.092 [.910]		1.041 [0.891]	
Multi family	.889 [0.297]		0.941 [0.318]		2.221 [0.689]	**	2.165 [0.671]	*
Receives income support	1.156 [0.191]		1.168 [1.192]		1.394 [0.230]	*	1.457 [0.241]	*
Has health condition	1.013 [0.134]		1.049 [0.138]		0.870 [0.104]		0.873 [0.307]	
Percentage of income to mortgage	1.010 [0.002]	***	1.011 [0.002]	***				
Housing equity/10,000	0.992 [0.004]	*	0.993 [0.003]	*	0.983 [0.005]	***	0.983 [0.004]	***
Age 34 years and below	1.693 [0.646]		1.775 [0.678]		1.804 [.731]	***	1.885 [.765]	
Age 35–44	1.207 [0.393]		1.238 [0.404]		1.574 [0.551]		1.577 [0.553]	
Age 45–54	1.177 [0.307]		1.184 [0.312]		1.107 [0.323]		1.116 [0.327]	
Major city	0.511 [0.153]	*	0.506 [0.151]	*	0.608 [0.234]		0.592 [0.229]	
Ed. Diploma/certificate	0.288 [0.219]		0.259 [0.199]		0.645 [0.490]		0.565 [0.434]	

	Purchaser payment arrears		Purchaser payment risk	
	Model 1	Model 2	Model 3	Model 4
Conditional fixed effects	OR			
Ed. year 12	0.299 [0.302]	0.299 [0.308]	0.200 [0.193]	0.200 [0.194]
Ed. year 11	0.400 [0.326]	0.371 [0.304]	0.691 [0.566]	0.617 [0.511]
Household moved	.817 [.107]	.803 [.106]	.901 [.115]	
LR chi2	100.99 ***	101.48 ***	114.22 ***	101.70 ***
Number of the obs	3,697	3,684	3,588	3,585
Number of groups	742	740	709	709

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

1. The omitted categories from the polychotomous categories are adequately employed multiple earners, couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

Appendix 3

Table A3: Definitions and units of measurement of model variables

Variables	Definition of variables	Measure
Dependent variables		
Rental arrears	Could not pay the rent on time in the past 12 months	1 = yes and 0 otherwise
Purchaser arrears	Could not pay the mortgage on time in the past 12 months	1 = yes and 0 otherwise
Purchaser constraint	Purchasers with a combined yes for the following: → Paying above 30 per cent of equivalent disposable income. → Cannot raise $2000 ($3000) without doing something drastic or not at all. → Prosperity given financial needs is just getting by to very poor.	1 = yes and 0 otherwise
Rental constraint	Renters with a combined yes for the following: → Paying above 30 per cent of equivalent disposable income. → Cannot raise $2000 ($3000) without doing something drastic or not at all. → Prosperity given financial needs is just getting by to very poor.	1 = yes and 0 otherwise
Control variables		
Underemployed multiple	One or more underemployed with other earners	1 = yes and 0 otherwise
Adequate single	Single earner not underemployed	1 = yes and 0 otherwise
Underemployed single	One earner only and is underemployed	1 = yes and 0 otherwise
Unemployed with earners	One earner with another member unemployed	1 = yes and 0 otherwise
All NLF	Zero earners who are all out of the labour force	1 = yes and 0 otherwise
Unemployed without earners	Zero earners with one or more unemployed	1 = yes and 0 otherwise
Omitted Adequate multiple	At least two members employed with no underemployment	1 = yes and 0 otherwise
Household hours deficit	Continuous measure of labour deficiency selected for household heads	Continuous
Couple with dependent child	Couple household with dependent children	1 = yes and 0 otherwise
Couple independent child	Couple household with independent children	1 = yes and 0 otherwise
Lone parent dependent child	Lone parent with dependent children	1 = yes and 0 otherwise
Lone parent independent child	Lone parent with independent children	1 = yes and 0 otherwise
Lone person	Lone person household	1 = yes and 0 otherwise
Group	Group household	1 = yes and 0 otherwise

Variables	Definition of variables	Measure
Multi family	Multi-family household	1 = yes and 0 otherwise
Omitted Couple without child	Couple without children in the household	1 = yes and 0 otherwise
Receives income support	Currently receives any income from the government in the form of a benefit, pension or allowance	1 = yes and 0 otherwise
Social Rental	Lives in either community or public rental housing	1 = yes and 0 otherwise
Proportion of rent to income	Proportion of monthly rental costs to monthly equivalised disposable income	Continuous percentage
Proportion of mortgage to income	Proportion of monthly mortgage costs to monthly equivalised disposable income	Continuous percentage
Coefficient of variance of household income	Cluster standard deviation of household equivalised disposable income divided by cluster mean of that income multiplied by 100	Continuous percentage Does not vary across observations for the same individual (or time invariant)
Equity/10,000	Total housing equity held divided by 10,000. Difference between total mortgage debt and imputed house value	Continuous
Has health condition	Has a long-term health condition	1 = yes and 0 otherwise
Age 34 & below	Age of household head is 34 years or below	1 = yes and 0 otherwise
Age 35–44	Age of household head is between 35 and 44 years	1 = yes and 0 otherwise
Age 45–54	Age of household head is between 45 and 54 years	1 = yes and 0 otherwise
Omitted 55+	Age of household head is 55 years or older	1 = yes and 0 otherwise
Major city	Lives in a major city in Australia	1 = yes and 0 otherwise
Omitted Other locations	Other areas include inner regional, outer regional, remote, very remote, and migratory Australia	1 = yes and 0 otherwise
Ed. Diploma/certificate	Highest level of education diploma	1 = yes and 0 otherwise
Ed. year 12	Highest level of education in year 12	1 = yes and 0 otherwise
Ed. year11	Highest level of education in year 11	1 = yes and 0 otherwise
Omitted Degree or higher	Highest level of education is Bachelor degree or higher	1 = yes and 0 otherwise
Household moved	Household moved in previous 12 months	1=yes and 0 otherwise
Recurrent spells of underemployment		
One spell of underemployment	One spell of underemployment for the total observations in the panel period	1=yes in all time periods if have only one spell and 0 otherwise (time invariant)
Two or more spells underemployment	Two or more spells of underemployment for the total observations in the panel period	1=yes in all time periods if have two or more spells and 0 otherwise (time invariant)

Appendix 4

Table A4: Individual and household predictors of underemployment, fixed effects logistic regression, HILDA 2001–2009

Fixed effects	Underemployment		Underemployment	
	Model 1		**Model 2**	
	Sample of purchasers		**Sample of renters**	
Couple with dependent child	1.846[.391]	***	.872[.181]	
Couple independent child	1.700[.470]	*	.228[.131]	**
Lone parent dependent child	2.206[.682]	*	1.712[.444]	*
Lone parent independent child	1.428[.892]		1.634[.611]	
Lone person	1.409[.447]		1.721[.341]	
Group	1.204[.915]		2.268[.686]	**
Multi family	1.952[.628]		1.286[.310]	
Receives income support	1.488[.210]	**	1.198[.130]	+
Has health condition	1.079[.136]		.951[.117]	
Social renter			1.229[.276]	
Percentage of mortgage/rent to income t-1	1.002[.002]		.999[.002]	
Mortgage/rent arrears t-1	1.147[.174]		1.012[.2]	
Age 34 years and below	1.024[.269]		1.495[.672]	
Age 35–44	.884[.270]		1.419[.578]	
Age 45–54	.700[.182]		1.365[.478]	
Major city	.921[.245]		.696[.128]	*
Ed. Diploma/certificate	1.907[.917]		3.579[1.332]	***
Ed. year 12	1.326[.670]		3.077[.999]	***
Ed. year 11	1.622[.846]		4.065[1.767]	***
Household moved	.988[.131]		1.037[.088]	
Number of observations	4,486		4,095	
Number of adults	820		797	
LR Chi(19)	31.68	*	66.22	***

* p <0.05, ** p <0.01, *** p<0.001. Standard errors shown in parenthesis.

The omitted categories from the polychotomous categories are couple without child, aged 55 years or higher, live in other locations from major city, has a degree or higher education.

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