



Research Paper

# Housing affordability and financial stress

**National Research Venture 3: Housing  
affordability for lower income Australians**

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authored by

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## EXECUTIVE SUMMARY

Housing affordability issues are gaining increasing prominence in an Australian context. In general, most of the immediate concerns relate to constraints that affordability imposes on housing outcomes for different households. For example, a lack of affordable housing can mean many households do not have access to adequate, appropriate and secure housing at a cost they can afford. However non-housing outcomes can also be affected by housing affordability. If housing absorbs a high proportion of household budgets, for instance, then the trade-offs households are required to make in order to meet their housing needs may mean they have inadequate resources to meet their non-housing needs. One potential implication is that households who pay high proportions of their household incomes to meet their housing needs may face financial stress in that they are less likely to have the financial resources needed to enable them to participate fully in the society in which they live. If this inability is a direct outcome of their high housing costs, in the sense that a reasonable reduction in housing costs would eliminate their financial stress, then reducing housing stress would eliminate financial stress. If the financial stress faced by households with high housing costs is greater than it is for households with lower housing costs, financial stress adds to concerns associated with poor housing outcomes arising from a lack of affordable housing even if reducing housing costs will not eliminate financial stress.

The purpose of this report is to provide a statistical analysis of the factors that contribute to financial stress. The key research question analysed is whether high housing costs contribute to financial stress. The report uses data collected by Australian Bureau of Statistics (ABS) for the 2003-04 Household Expenditure Survey (HES) to undertake this analysis.

Chapter 1 provides background information on the role of financial stress and deprivation indicators recorded in the HES. An example of the former is going without meals. An example of the latter is not being able to afford a week's holiday once a year. These are used to create a composite index in which households are defined as being in some financial stress if they reported just one occurrence of any of the deprivation or financial stress indicators available in the HES, and as being in high financial stress if they reported more than one occurrence. Chapters 2 and 3 examine the risk factors that contribute to financial stress. They also provide a summary of the role these play in contributing to housing stress, defined on a 30/40 rule: that is, for households in the lowest two quintiles (40 per cent) of the equivalent disposable income distribution spending at least 30 per cent of their gross household income in meeting their housing costs.

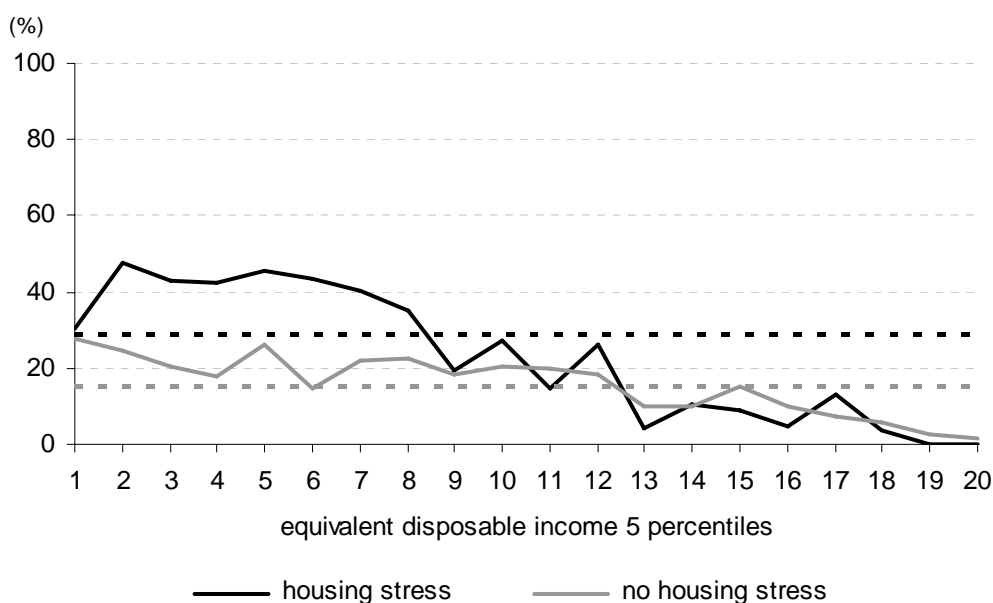
The results presented in Chapters 2 and 3 show that incidence of financial stress decreases markedly as household income increases and somewhat less markedly as the age of the household increases. By household type, however, the incidence of financial stress is remarkably similar although that of high financial stress is well above average for sole parents (and only for sole parents). By tenure, the incidence of financial stress is well above average for renters and, particularly, for renters in public housing. In the main, the factors that increase the risk of being in financial stress are the same factors that increase the risk of being in housing stress. These initial results clearly point to common factors that contribute both to housing and financial stress.

In addition, the results in Chapter 3 also show, almost without exception, that the incidence of financial stress is higher for households with housing cost ratios of 30 per cent or more of income than for households whose housing cost ratios were less than

30 per cent of income. This holds for households in each of the 5 age groups and each of the 6 household types considered. It holds for households in every one of the 5 tenure categories other than those in public housing and for households in all but one of the higher (equivalent disposable) income quintiles considered.

In particular, the incidence of financial stress and high financial stress is significantly higher for lower income households who were also experiencing housing stress. This is illustrated below, in a chart used in Chapter 2.

**Figure 1: Incidence of high financial stress by housing stress**



The formal analysis presented in the concluding section of Chapter 3 suggests that the correlation between housing and financial stress for lower income households can be attributed to their common risk factors. Low income, youth, having only a single adult in the household, and renting all contribute both to financial stress and to housing stress. In other words, the results of the paper highlight the extent to which at least two of the sources of disadvantage faced by many low income households (viz. housing stress and financial stress) can be attributed to the socio-economic and demographic characteristics of those households. The results therefore suggest that policy responses, including housing policy responses, need to recognise the diversity of the risk factors that contribute to both housing and financial stress.

When all of these common risk factors are controlled for simultaneously through use of multivariate analysis, however, the analysis fails to establish a statistical relationship between financial and housing stress. A number of technical reasons why this might be so are provided at the end of Chapter 3.

When each of these risk factors are controlled for individually, however, the formal analysis reported at the end of Chapter 3 suggests that, if a household is experience housing stress, there is a ten percentage point increase in the probability that it will also experience financial stress over and above, respectively, the impact of income, age, household type and tenure.

The paper concludes that financial stress would not be eliminated by lowering housing costs alone. Financial stress is determined by a number of factors, many of which also determine housing stress. As such, the results caution against the simplistic conclusion that improving housing affordability outcomes alone will address this

particular manifestation of one of the multiple sources of deprivation many lower income households face. However, the results do suggest that reducing the incidence of housing stress will reduce the incidence of financial stress.



# 1 HOUSING AFFORDABILITY AND FINANCIAL STRESS

## 1.1 Overview and outline

Housing affordability issues are gaining increasing prominence in an Australian context. In general, most of the immediate concerns relate to the burden that housing costs place on housing budgets and to the constraints that affordability imposes on housing outcomes for different households. For example, a lack of affordable housing can mean many households do not have access to adequate, appropriate and secure housing at a cost they can afford. Lower income households paying at least 30 per cent of their income in meeting their housing costs are defined as being in 'housing stress'.<sup>1</sup> However non-housing outcomes can also be affected by housing affordability. If housing absorbs a high proportion of household budgets (so that their housing cost to income ratio is high), then the trade-offs households are required to make in order to meet their housing needs may mean they have inadequate resources to meet their non-housing needs.

One potential implication is that households who pay high proportions of their household incomes to meet their housing needs are less likely to have the financial resources needed to enable them to participate fully in the society in which they live. Such households can be defined as being in financial stress. If this inability is a direct outcome of their high housing costs, in the sense that a reasonable reduction in housing costs would eliminate their financial stress, then reducing housing stress would eliminate financial stress. If the financial stress faced by households with high housing costs is greater than it is for households with lower housing costs, financial stress adds to concerns associated with poor housing outcomes arising from a lack of affordable housing even if reducing housing costs will not eliminate financial stress. As such, it extends concerns about housing affordability beyond the burden that housing costs impose upon household income.

This broader concern with housing affordability underpins so-called 'residual' housing affordability measures that take into account the relationship between housing costs and a household's capacity to maintain an acceptable standard of living. A recent exposition by the key proponent of 'residual' measures of housing affordability can be found in Stone (2006). It also underpins the after-housing poverty measures employed in much poverty research (for example, Harding and Szukalska, 2000).<sup>2</sup> Before examining how much income is available for spending on housing, residual measures assess how much income is needed to ensure households are able to meet their basic non-housing needs. In terms of the above, they focus on how much income is needed to ensure that a household is not in financial stress. Housing stress

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<sup>1</sup> This definition has been employed in the work undertaken for NRV3, the National Research Venture on housing Affordability for Lower Income Australians. Lower income households are those in the lowest 40 per cent of the equivalised disposable income distribution. Equivalised disposable income is derived by dividing disposable income by an equivalence factor derived using the 'modified OECD' equivalence scale in which the first adult in the household has a weight of 1 point, each additional person aged 15 year or more is allocated 0.5 points and each child under the age of 15 is allocated 0.3 points. The equivalised income of a single person household is the same as its unequivalised income. The equivalised income of a household with more than one person is lower than its unequivalised income. The purpose of this adjustment is to allow for the economies of scale that arise from the sharing of income.

<sup>2</sup> A current AHURI project on housing costs and financial disadvantage at a national and regional level also proposes use of the residual income measure embodied in measures of after housing poverty (McNamara et al., 2006).

is then determined by how much is available for housing once non-housing needs are met.

An earlier Research Paper for NRV3 covered the issues associated with measuring housing affordability by a ratio measure, such as that embodied in the above definition of housing stress, and with broader interpretations such as that embodied in a residual measure (Gabriel et al., 2005). A later paper provided estimates of the numbers of households who have housing affordability problems when considered under different measures (Yates and Gabriel, 2006). Both of these papers highlighted the inherent difficulties associated with a residual housing affordability measure because of the difficulties of determining appropriate housing and budget standards. They provide an explanation of why simpler affordability measures, such as those based on the ratio of housing costs to income, are employed to determine whether or not a household is defined as having a housing affordability problem. However, they also signal a weakness with the simple measures: viz. they do not give any indication of the non-housing outcomes that might be associated with housing stress or a high housing cost ratio such as is attempted by residual measures. It is one aspect of this weakness that is addressed in this paper.

In this paper, an alternative approach to embodying broader concerns in housing affordability is taken to examining the impact of housing stress or high housing costs on non housing outcomes reflected by aspects of a household's standard of living. The paper moves away from attempts to include these concerns in a more complex measure such as is done in the residual approach. It therefore does not need to attempt to determine either appropriate housing or appropriate budget standards. Instead, it focuses specifically on the relationship between housing affordability defined by the simple ratio measure and a limited range of non-housing outcomes that reflect economic and social well being. When selecting non-housing outcomes for consideration, this paper employs the financial stress and deprivation indicators of economic hardship that were included by the ABS for the first time in the 1998-99 Household Expenditure Survey (HES) and again in the recently released 2003-04 survey.

The purpose of this report is to provide a statistical analysis of the factors that contribute to financial stress. The key question addressed is whether housing stress (when the analysis is limited to lower income households) or high housing costs (when all households are included) contribute to financial stress. A measure of financial stress is derived from the deprivation and financial stress indicators reported in the 2003-04 Household Expenditure Survey.

The remainder of this chapter describes the data available in the HES, describes the measures of financial stress employed, and provides a brief overview of relevant results from studies that have used these data from earlier surveys. Chapter 2 presents a descriptive overview of results on housing and financial stress at an aggregate level from the most recent HES. Chapter 3 provides a more detailed analysis of these results disaggregated by a range of potential risk factors such as income, age, household type and tenure. It concludes with a formal analysis of their inter-relationships. Chapter 4 summarises the key conclusions from the analysis.

## **1.2 Background and definitions**

This section provides a comparative overview of the various approaches to measuring financial stress that have been employed in studies using data for Australia and the rationale for the measures employed. The specific measures employed in this paper are not discussed until in section 1.3.

### 1.2.1 Background to measuring financial stress

In the recent ABS surveys under discussion here, the inclusion of deprivation and financial stress indicators reflects a move away from a single dimension approach to defining economic hardship, such as one based on income alone, and towards a multidimensional approach that reflects the capacity of people to enjoy a socially acceptable minimum material standard of living. Saunders (2004, 2005) places deprivation into a broader method for conceptualising disadvantage. Headey (2006) relates a preference for such multidimensional measures (of which material deprivation is one) back to Nobel prize winner Amartya Sen's work on conceptualising and measuring poverty (see for example Sen, 1987). Material deprivation indicators such as those to be described in this chapter are related back to Townsend (1979). In Australia, developmental work on deprivation indicators was undertaken by Travers and Richardson (1993) with a follow up report by Travers and Robertson (1995). An overview of early work undertaken by The Australian Institute of Family Studies can be found in Brownlee and McDonald (1991).

#### Deprivation indicators

Data on deprivation (or social activity) and financial stress have been used by the ABS to supplement its headline indicator of economic hardship based on changes in (real equivalised disposable) household income. This is done in recognition of the fact that income is not the only economic resource available to households. Household wealth is identified as playing an important role. Economic hardship may also be affected by financial needs of households, and these can differ for a number of reasons such as household size and differences in medical needs, but also because of regional differences in housing costs. Along with most commentators who advocate the use of multidimensional indicators, the ABS concludes "there is no standard way to measure the total resources available to a household, nor to measure the financial needs of a household [but argue] it is useful to examine the indicators of the economic situation of households which can more directly identify households at risk of or actually falling below minimum acceptable living standards" (ABS, 2006d, p69-70). The deprivation and financial stress measures employed in the Household Expenditure Survey are examples of such indicators.<sup>3</sup>

The HES collected data on 6 specific deprivation indicators which households indicated they were unable to afford. These included:

- Week's holiday away from home at least once a year
- Night out once a fortnight
- Special meal once a week
- New clothes (buy second hand clothes most of the time)
- Leisure or hobby activities
- Family/friends for a meal once a month

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<sup>3</sup> Similar data were collected in the earlier 2002 General Social Survey. The introduction to the summary results from that survey suggested a rationale for why such data were collected. It was predicated on the assumption that "[a]mong the many, often inter-related aspects of life that are important to human well-being are good health, good family relationships and engagements with wider social networks, good educational opportunities and outcomes, suitable employment, a decent income and freedom from financial stress, a decent and affordable place to live, feeling safe and secure, and having access to suitable transport. There is increasing recognition that many social phenomena are inter-related and social policy is becoming less sectoral as a consequence." (ABS, 2003, p1)

Households who report missing out on a range of goods or activities because they cannot afford them are regarded as being deprived of expenditures seen to reflect socially accepted norms about the basics of life. In deciding which deprivation indicators to employ in its various surveys, the ABS drew on results from the Travers and Robertson report. The indicators were selected from a wide range of those employed by Travers and Robertson and were chosen because they were most highly correlated with the more complex index of deprivation compiled in the Travers and Robertson report. (McColl et al., 2001, p15). The ABS caution users of these indicators to take care in using individual responses in isolation from other responses since households "have their own priorities and consumption preferences and may choose quite different patterns of expenditure from a socially accepted norm of the basics of life." (ABS, 2006a, p30)

### Financial stress indicators

These deprivation indicators in the HES are supplemented by 7 financial stress questions which relate to cash flow problems attributable to a shortage of money in the past year. These are:

- Could not pay gas/electricity/telephone bill on time
- Sought financial help from friends/family
- Could not pay registration/insurance on time
- Pawned or sold something
- Went without meals
- Sought assistance from welfare/community organisations
- Unable to heat home

There are also two additional questions relating to the financial resources available to the household (covering their capacity or otherwise to save and to raise \$2,000 in a week) and a question of subjective well being (comparing present standard of living with 2 years ago). As with the deprivation indicators, users are cautioned against using any one of these indicators in isolation. This is because preferences of households among the various indicators might be affected by household composition, and different households will respond to financial pressures in different ways, with some higher income households as likely to experience cash flow problems as lower income households. This notwithstanding, the ABS suggest that "the incidence of different household types reporting multiple indicators of financial stress can give an indication of those most likely to have unacceptably low living standards" (ABS 2006d, p70).

### Measures employed in other studies

Results on the deprivation indicators collected in the 1998-99 HES were published by the ABS in McColl et al. (2001). A more detailed study can be found in Bray (2001). Both studies used equivalent disposable household income to report their results.<sup>4</sup> McColl et al. made no distinction between deprivation and financial stress, and aggregated all 15 available individual indicators. In addition, after an exploration based on defining a household as being in financial stress if it reported experience of any one of the indicators, they discarded those cases where the incidence of just one

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<sup>4</sup> A minor difference is that McColl et al. used the 1982 OECD scale to equalise incomes. This assigned 1 to the first adult, 0.7 to second and subsequent adult or non-dependent child and 0.5 to each dependent child. Bray used the revised OECD scale with, respectively, 1, 0.5 and 0.3 weights.

indicator was reported, and revised their definition of financial stress as applying to households reporting at least two indicators. Households reporting 2 to 4 indicators were described as being in “moderate” financial stress and those with 5 or more in “high” financial stress. McColl et al. argued this classification reflected a natural break in the incidence of indicator reporting, with 17 per cent of households reporting just one of the 15 indicators, falling sharply to 9 per cent reporting only two, and then more slowly with 7 per cent reporting three and 5 per cent reporting 4 indicators. On their definitions, 66 per cent of households were considered not to be in financial stress, 21 per cent indicated moderate levels of financial stress, and 13 per cent were defined as being in high financial stress.

An even simpler approach to defining what they called “financial fragility” was employed by La Cava and Simon (2005) in their analysis of data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey for 2001, and from the 1998-99 HES.<sup>5</sup> Their study focused on household debt and financial constraints rather than deprivation and their concern was that people were borrowing more than they could afford and, consequently, would experience cash flow problems and be unable to service loan repayments. Because of their focus on cash flow constraints, La Cava and Simon’s definition ignored the deprivation indicators and focussed solely on the 7 financial stress indicators available in the 1998-99 HES (and replicated from data available in the HILDA survey). These indicators are the same as those listed above. A household who answered “yes” to any one of these financial stress indicators was defined as being financially (or cash flow) constrained (or stressed). On this measure, 31 per cent of households in the HILDA survey but only 22 per cent of households in the HES were defined as being financially constrained.<sup>6</sup> La Cava and Simon concluded that mortgage repayments as a share of household income had a positive but small impact on the probability that a household was likely to be financially constrained.

The study by Bray (2001) was more comprehensive and used a more sophisticated approach to deriving an aggregate measure of financial stress. Bray’s study will be described in more detail below, and provides a starting point for the analysis of financial stress indicators undertaken in this paper. One of the key conclusions of Bray’s study was that housing tenure, and particularly renting, was a critical factor in determining whether households experienced higher levels of financial stress. When socio-demographic and economic characteristics were controlled for, private renters had a significantly higher incidence of financial stress than households in any other tenure. Private renters also constituted the greatest numbers of households in financial stress. Low income private renters paying at least 30 per cent of their household income in meeting their housing costs were particularly vulnerable. This result raises questions about the extent to which difficulties in meeting housing costs impact on other aspects of people’s lives.

Breunig and Cobb-Clark (2005) employed the same cashflow and hardship measures derived by Bray in their update of his analysis. Based on HILDA wave 2 (2001) survey data, their results suggest that, once socio-demographic, economic and spatial

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<sup>5</sup> They also employed econometric techniques based on results from the 1998-99 survey to estimate the proportion of financially stressed households in 1993-94.

<sup>6</sup> They attribute the difference to the use of face to face survey methodology in the HES in contrast to the self-administered survey employed in HILDA rather than to an increase in the proportion in stress between 1998-99 and 2001. They undertook checks that the difference in magnitude had no impact on their key results. These proportions (from HILDA or HES) are lower than those reported by McColl for 1998-99 and below for the 2003-04 HES because they are based on a more narrowly defined range of indicators.

variables are controlled for, home owners or purchasers are substantially less likely to experience financial hardship or cashflow problems than are renters.

In the results sketched briefly above, two different approaches to aggregating the multiple dimensions of financial stress included in the surveys have been employed. The simplest single indicator measures, as employed by McColl or La Cava and Simon, have been derived by summing the various deprivation and financial stress indicators. The more complex multiple measures, as employed by Bray and Breunig and Cobb-Clark, have been derived from a statistical analysis of these indicators.

The question of how the available multiple dimensions might be aggregated to derive a meaningful and valid aggregate measure of financial stress has been addressed explicitly in a recent study by Butterworth and Crosier (2005). Butterworth and Crosier used the HILDA survey data (which is a subset of that available in the HES) to examine different measures. They concluded that, whilst the multiple measure approach which forms the basis of the Bray and Breunig and Cobb-Clark methods adequately fits the data, it is not robust across different surveys. A simpler single indicator approach is both adequate and generates the same pattern of results because of the high correlation between the alternative measures. Butterworth and Crosier conclude "a summary measure representing a simple count of financial hardship is an adequate method of calculating a measure of hardship" (p9). However, they explicitly recognise the potential value of distinguishing between the different types of financial stress that might be experienced. This conclusion has influenced the approach in this paper.

### *1.2.2 Financial and housing stress indicators*

Between 1998-99, when data on financial stress were first collected in the HES and 2003-04, when the current data were collected, economic conditions generally improved but housing affordability worsened. In the intervening 5 years from 1998-99, mean real household income grew at just under 2 per cent per annum (ABS, 2005, Table 2). At the same time, the ratio of mean housing costs to mean household incomes increased from 11.1 per cent to 12.0 per cent (ABS 2005a, Tables 1 and 2).

These trends are likely to have increased housing stress and to have had an indeterminate effect on financial stress. The more recent HES provides an opportunity for determining the impact of improved economic conditions on financial stress. It also creates an opportunity to determine the impact that housing affordability has on financial stress and on social activity.

In this paper's examination of the relationship between housing affordability and selected indicators of economic and social well being, housing stress is defined as occurring when lower income households pay at least 30 per cent of their gross household income in meeting their housing costs. Housing costs are as defined in the various Surveys of Income and Housing (SIH) rather than as in the HES.<sup>7</sup> Results for housing stress definitions based on the conventional restriction to households in the lowest 2 quintiles of the equivalised disposable income distribution and for definitions without any income restriction are reported.

Definitions of financial stress are derived from the indicators included in both the 1998-99 and the 2003-04 Household Expenditure Surveys. As indicated, the

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<sup>7</sup> In the SIH housing costs for purchasers include repayments of principal as well as mortgage interest payments and payments for rates, exclude expenditure on insurance and repairs and maintenance and are gross of any refunds, unlike the current housing costs for purchasers reported in the HES. For renters they reflect current outlays on rents. The SIH definition is employed in this study for consistency with other analyses undertaken for NR3.

definitions employed here are based on those used by Bray (2001) in order to facilitate a comparison of results from the latest HES with those obtained earlier. A summary of these earlier results is presented alongside the current results in the Tables below. More detailed results from the earlier survey and the measures employed can be found in Bray (2001).

## **1.3 Financial stress and deprivation**

### *1.3.1 Indicators recorded in HES*

As indicated above, three different types of deprivation indicators were recorded in both the 1998-99 and 2003-04 Household Expenditure Surveys. The first two cover experiences of financial stress and experiences of deprivation, or missing out on social activities. The third set covered outcomes on a range of subjective measures. This section reports results on these measures.

The financial stress indicators, collected as dichotomous variables, covered a range of actions taken by the household over the past year due to a shortage of money. They ranged from not being able to pay bills on time to going without meals. The indicators and their outcomes disaggregated by equivalent disposable income quintile for 2003-04 are indicated in the top half of Table 1.1 below.

The HES deprivation variables covered participation in a range of activities, most of which could be classified broadly as social activity (such as having a night out or a holiday), as well as a reason for why the household did not participate in this activity. This supplementary information provided a means of distinguishing personal preference (don't want to) from financial (can't afford it) or other (undefined) constraint. In the table below, only the cases of deprivation arising from financial constraint are reported; that is, cases where the household missed out on the activity because they could not afford to undertake it. Data were collected on which of these deprivation indicators were experienced but not on how many times they occurred. The indicators employed and their outcomes are indicated in the bottom half of Table 1.1.

The final two columns of Table 1.1 provide the equivalent results on each of these sets of indicators for 1998-99. Comparison of the totals for 2003-04 and 1998-99 show the outcomes are remarkably similar, both in terms of the overall incidence and the relative hierarchy of the outcomes. The overall incidence of financial stress and social inactivity was marginally higher in 1998-99 but the growth in the number of households means that the total numbers affected are marginally higher in 2003-04.<sup>8</sup>

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<sup>8</sup> A comparison of these results with those presented in Bray's Table 1, shows that a similar conclusion can be drawn from the results for each income quintile.

**Table 1.1: Incidence of financial stress and deprivation by household income, 2003-04 and 1998-99**

	Equivalent disposable income quintile					Total		Total	
	Q1	Q2	Q3	Q4	Q5	2003-04	1998-99	1998-99	1998-99
	(% of households)					(%)	('000s)	(%)	('000s)
<b>Due to shortage of money in past year</b>									
Could not pay gas/electricity/telephone bill on time	21	20	17	12	4	15	1,153	16	1,147
Sought financial help from friends/family	14	15	11	8	4	10	794	10	705
Could not pay registration/insurance on time	7	8	6	5	2	6	443	7	463
Pawned or sold something	7	5	3	2	1	4	274	4	299
Went without meals	8	4	2	2	0	3	238	3	192
Sought assistance from welfare/community organisations	8	4	2	1	0	3	228	4	249
Unable to heat home	5	4	2	1	0	2	174	2	157
<b>Cannot afford</b>									
Week's holiday away from home at least once a year	45	35	26	17	7	26	2,000	27	1,944
Night out once a fortnight	34	27	18	12	4	19	1,468	19	1,382
Special meal once a week	24	15	10	6	2	12	897	12	826
New clothes (buy second hand clothes most of the time)	23	17	9	5	1	11	856	12	840
Leisure or hobby activities	20	13	7	4	1	9	692	9	648
Family/friends for a meal once a month	14	7	6	3	0	6	473	5	377
<b>No. of households ('000s)</b>	<b>1,547</b>	<b>1,547</b>	<b>1,547</b>	<b>1,548</b>	<b>1,547</b>	<b>7,736</b>			<b>7,122</b>

Source: Household Expenditure Survey 2003-04 CURF; 1998-99 data from Bray (2001, Table 1)

These figures show that, whilst a relatively small proportion of households are affected by any one of these indicators, in both 1998-99 and 2003-04 there were generally more than 200,000 households who faced at least one of the various types of financial stress indicated in the top half of Table 1.1. More than 1 million households (15 per cent of all households) reported they were unable to pay their gas or electricity bills on time because of a shortage of money. The fact that a significant proportion of these were households in the top income quintile highlights the basis for the caution ABS suggest should be used in using individual responses. The results in the bottom half of the table also show there generally were at least 400,000 households for whom financial constraints restrict their range of social activities, with 2 million households (26 per cent of all households) reporting they were unable to afford a week's holiday away from home at least once a year.

Table 1.1 clearly indicates the impact of low household income on these outcomes. For households in the lower income quintiles, there are significantly higher incidences of both financial stress and deprivation on every one of the indicators.

In addition to the financial stress and deprivation indicators, the HES also collected data on a third set of variables that were more subjective. These variables covered the ability of the household to raise emergency money, management of household income, and an assessment of their present standard of living compared with 2 years ago. A subset of questions assessed how the household would cope in an emergency. The results are summarised in Table 1.2.



**Table 1.2: Living standards and budget outcomes by household income, 2003-04 and 1998-99**

	Equivalent disposable income quintile					Total		Total	
	Q1	Q2	Q3	Q4	Q5	2003-04		1998-99	
	(% of households)					(%)	('000s)	(%)	('000s)
Living standard compared with 2 years ago									
Better	15	20	26	41	48	30	2,321	28	2,001
Same	44	46	47	38	35	42	3,239	43	3,041
Worse	41	33	26	20	15	27	2,085	26	1,859
Household not comparable	1	1	1	2	2	1	91	3	214
Over the past 12 months usually									
Spend more money than we get	25	21	19	15	8	18	1,363	15	1,047
Just break even most weeks	57	57	52	44	31	48	3,735	53	3,767
Able to save money most weeks	18	22	29	41	61	34	2,638	32	2,307
Could not raise \$2000 in a week	29	20	13	8	2	14	1,105	19	1,360
No. of households ('000s)	1,547	1,547	1,547	1,548	1,547		7,736		7,122

Source: Household Expenditure Survey 2003-04 CURF; 1998-99 data from Bray (2001, Table 1)

Just over 40 per cent of households reported their standard of living was the same as 2 years ago. The remainder were more or less equally divided between households for whom it had increased and those for whom it had decreased. These proportions, whilst marginally improved, are similar to those reported in 1998-99. More than 1.3 million households (18 per cent of all households) reported spending more money than they received over the past year, up from 1 million or 15 per cent of households in 1998-99. Fewer reported that they were not able to raise \$2,000 within a week in 2003-04 compared with 1998-99 (14 per cent of all households in 2003-04 compared with 19 per cent in 1998-99). This last comparison, however, is of marginal value as the data have not been inflation adjusted.

In using these multidimensional indicators of financial stress and deprivation to supplement or modify conventional income definitions of poverty, Saunders (2004) suggests two alternative approaches have been employed. The first defines as "poor" anyone's household whose income is below a defined minimum and who has experienced at least one of the indicators listed in Table 1.1 or Table 1.2 above. The second restricts this to the household's experience of what are described as "core hardship" indicators, covering all of the financial stress indicators in the top half of Table 1.1 except for seeking financial assistance from friends or family. No explanation is provided for these options which differ from the aggregation employed by McColl et al. (2001) and Bray (2001).

These differences in approaches to defining an aggregate indicator of financial stress highlight a difficulty with multidimensional indicators. As a precursor to describing the indicators to be employed in this study, the following sub-section outlines the approach employed by Bray. The chapter concludes with an overview of the methodology employed to generate the aggregate financial stress indicator employed in Chapters 2 and 3 in the analysis of the relationship between financial stress and housing stress or high housing cost ratios undertaken in this paper.

### 1.3.2 Cashflow, hardship and missing out indicators

In his analysis of the financial stress and social activity indicators in the 1998-99 Household Expenditure Survey, Bray (2001, p69) used factor analysis to group the range of variables in Table 1.1 according to correlations between them. The variables in Table 1.2 were omitted because they were seen as being conceptually different,

related to hypothetical situations, were difficult to interpret, and did not show a consistent relationship to the other questions (Bray 2001, pp93-95).

Bray's analysis suggested the indicators listed in Table 1.1 could be described as falling into one of three distinct groups:

- "the degree to which households constrain the activities they undertake in order to meet household budget limitations. That is, the extent to which they miss out on doing some things they would like to do because they cannot afford to;
- the capacity of households to be able to manage their financial activities, and in particular their cashflow; and
- situations where a household may have been unable to achieve some basic outcome, or has needed to rely on 'last resort' to manage." (Bray, 2001, p69)

Bray assigned shorthand descriptions for these three groups of indicators: missing out, cashflow problems, and hardship problems. The first group ("missing out") covered being unable to have family and friends over once a month for a meal, or to have a special meal once a week, to buy new rather than second hand clothes, to have a holiday away from home once a year or spend a night out once a fortnight, and finally, being unable to spend time on leisure or hobby activities. These problems were seen as being related to the capacity of a household to participate in a range of activities consistent with a reasonable standard of living, and thus contribute to deprivation. The second group of indicators ("cashflow problems") covered being unable to pay bills on time and needing to borrow money from friends and family, and can be described as coping mechanisms. The third group ("hardship") covered being unable to afford heating and meals, having to pawn or sell possessions, and needing assistance from community organisations. These indicators covered a mix of deprivation outcomes and coping mechanisms.

These three groups are seen by Bray as reflecting a hierarchy of difficulties. Problems in the first group are relatively widespread, and are seen generally as a natural consequence of having to set priorities and make trade-offs in everyday life. Problems in the third group, however, have considerable capacity to reflect real hardship.

The results for this summary taxonomy when applied to the 2003-04 HES data are presented in Table 1.3 below. This table follows the same structure as that presented in Bray in order to facilitate comparison with the earlier results. As above, the summary results for 1998-99 are presented in the final columns of Table 1.3. The disaggregated results for 1998-99 can be found in Table 3 of the source paper.

**Table 1.3: Cashflow, hardship and missing out indicators by household income, 2003-04 and 1998-99**

	Equivalent disposable income quintile					Total		Total	
	Q1	Q2	Q3	Q4	Q5	2003-04		1998-99	
	(% of households)					(%)	('000s)	(%)	('000s)
Missing out									
no missing out indicator	43	51	62	76	89	64	4,976	62	4,394
at least one	57	49	38	24	11	36	2,760	38	2,728
2 or more	41	31	20	13	3	22	1,665	22	1,553
3 or more	27	18	11	6	1	12	959	13	890
4 or more	18	9	5	3	0	7	550	7	499
5 or more	11	5	3	1	0	4	324	4	256
6	5	2	1	1	0	2	130	1	93
Cashflow problems									
no cash flow indicator	74	75	78	84	93	81	6,229	79	5,655
at least one	26	25	22	16	7	19	1,506	21	1,467
2 or more	12	13	11	6	2	9	687	9	655
3	3	4	2	3	1	3	197	3	192
Hardship problems									
no hardship indicator	84	89	93	96	99	92	7,127	92	6,538
at least one	16	11	7	4	1	8	608	8	584
2 or more	7	4	2	1	0	3	208	3	221
3 or more	3	1	0	0	0	1	74	1	71
4	1	1	0	0	0	0	24	0	21
No. of households ('000s)	1,547	1,547	1,547	1,548	1,547	7,736		7,122	

Source: Household Expenditure Survey 2003-04 CURF; 1998-99 data from Bray (2001, Table 3)

As can be seen from these results in Table 1.3, the “missing out” indicators have a different pattern of incidence from the “cashflow” or “hardship” indicators. Nearly 40 per cent of households (in both 1998-99 and 2003-04) reported at least one occurrence of the missing out indicators listed in Table 1.1. Only 19 per cent of households (21 per cent in 1998-99) reported at least one occurrence of a cashflow indicator, and only 8 per cent reported at least one occurrence of a hardship indicator. More than 2.7 million households reported missing out on at least one of the listed social activities in 2003-04 because they felt they could not afford it. A significant 1.5 million households reported at least one occurrence of a cashflow problem with 687,000 reporting at least two occurrences. Finally, 608,000 households reported at least one occurrence of hardship in 2003-04 and 208,000 reported at least two occurrences. All of these numbers are virtually unchanged from the numbers reporting hardship in 1998-99 despite the general improvement in household incomes in the intervening period. They suggest a certain robustness in the chosen measures reported below.

### 1.3.3 Summary financial stress indicators

In order to simplify the analysis of outcomes which varied from none to many occurrences of the specific stress indicators within these groups, Bray distinguished what he called “lower” and “higher” levels of financial stress. Lower levels arose when the household reported either some stress, with just one occurrence of the problems within any group, while higher levels of stress corresponded with multiple occurrences of problems in any group. Bray argued that this latter measure, in which households have experienced financial stress on more than one occasion, is a more robust indicator of substantial financial stress.

Table 1.4 provides a summary of the potential combinations of no occurrence, at least one occurrence, and more than one occurrence of each of the three indicators

(missing out, cashflow and hardship). It highlights the extent to which the experiences of these indicators are inter-dependent and determines the hierarchy in their pattern of incidence. The results, with one exception, are ranked in descending order according to the number of households experiencing the various combinations. The exception is the 0.3 per cent of households who reported just one case of hardship, no cashflow problems, and no occurrences of missing out, and who are classified as having a low level of financial stress.

The results show that 58 per cent of households experienced none of the financial stress indicators reported in the HES. They also show that 21 per cent report missing out on some social activities because they cannot afford them but report no occurrences of cashflow or hardship problems. At least half of these reported multiple occurrences of missing out on social activities but no cashflow or hardship problems. A further 11 per cent reported at least one or more occurrences of a cashflow problem alongside experiences of missing out, but still experienced no hardship problems. Less than 1 per cent of households reported multiple hardship problems without also reporting at least one experience of a cashflow problem or of missing out on social activity. Of these small numbers of households reporting hardship problems but not reporting missing out, a high proportion were higher income households.

**Table 1.4: Summary financial stress indicators\*, 2003-04**

			Total	
			2003-04	
			(%)	('000s)
<i>No financial stress</i>				
-	-	-	58.0	4,489
<i>Low level of financial stress</i>				
multiple missing out	-	-	10.9	842
some missing out	-	-	10.1	784
-	some cashflow	-	3.6	275
-	-	some hardship	0.3	26
<i>High level of financial stress</i>				
multiple missing out	some cashflow	-	3.0	229
multiple missing out	multiple cashflow	-	2.3	178
some missing out	some cashflow	-	2.0	157
multiple missing out	multiple cashflow	some hardship	1.6	126
multiple missing out	multiple cashflow	multiple hardship	1.6	120
-	multiple cashflow	-	1.3	98
some missing out	multiple cashflow	-	1.0	75
multiple missing out	some cashflow	some hardship	0.8	65
multiple missing out	-	some hardship	0.8	59
multiple missing out	some cashflow	multiple hardship	0.5	37
-	multiple cashflow	some hardship	0.5	37
-	some cashflow	some hardship	0.4	30
some missing out	multiple cashflow	some hardship	0.3	23
some missing out	some cashflow	some hardship	0.3	20
-	multiple cashflow	multiple hardship	0.2	16
some missing out	-	some hardship	0.2	16
some missing out	multiple cashflow	multiple hardship	0.2	13
multiple missing out	-	multiple hardship	0.1	8
some missing out	some cashflow	multiple hardship	0.1	5
-	-	multiple hardship	0.1	5
-	some cashflow	multiple hardship	0.0	1
some missing out	-	multiple hardship	0.0	1
no. households ('000s)			7,736	

\* Ranked in descending order by number of households except for line 4 in the low level of stress category

Source: Household Expenditure Survey 2003-04 CURF

The results in Table 1.4 reinforce the suggestion that there is a hierarchy in the measures based on the 3 group taxonomy of financial stress. Most households (58 per cent) do not experience any form of financial stress. Many households (21 per cent) miss out on social activity because they cannot afford it, but do not experience cashflow or hardship problems. A further 4 per cent report no more than one occurrence of a cashflow or hardship problem but do not report any occurrences of missing out on social activity as a result of their inability to afford this. In the analysis that follows in Chapters 2 and 3, these 25 per cent of households are regarded as having low financial stress.

The remaining 17 per cent of households who experience multiple cashflow or hardship problems, or who experience some cashflow or hardship problem AND at least one or multiple occurrences of one other form of financial stress, are regarded

as experiencing high financial stress. More than half (10 per cent) of these have some or multiple occurrences of missing out and have some or multiple cash flow problems but do not experience hardship problems. Of the remainder, less than 2 per cent experienced multiple occurrences on all indicators.

In the analysis that follows in Chapters 2 and 3, two composite indicators of financial stress are employed. The first is based on the 42 per cent of households experiencing some financial stress and covers those classified as having either low or high level financial stress.<sup>9</sup> The second is restricted to the 17 per cent of households experiencing multiple incidences of the various indicators employed. In other words, it excludes the 25 per cent of households experiencing only low level financial stress.

Chapter 2 provides a descriptive overview of the relationship between housing affordability, household income and the composite indicators of financial stress. Chapter 3 extends the analysis to include a wider range of risk factors.

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<sup>9</sup> This taxonomy differs marginally from Bray's in that households experiencing multiple occurrences of missing out without any cashflow or hardship problems are classified as being in low financial stress only. Bray classifies these households as having high financial stress along with those experiencing multiple cashflow or multiple hardship problems. In other words, the definition above differs in that it imposes the additional constraint of at least some cashflow or hardship problem before a household is classified as being in high financial stress. One difficulty with Bray's classification is that it excludes households with multiple occurrences of stress on one indicator and some on another. A comparison of the variables included in the low and high financial stress measures used in this paper with those used by Bray is provided in Appendix A.

## 2 ANALYSIS OF AGGREGATE RESULTS

### 2.1 Introduction

This chapter provides a broad overview of housing stress and financial stress as reported in the 2003-04 HES and analyses the relationship between these indicators and household income. A more detailed analysis which examines the relationships between housing and financial stress outcomes and age, household type, tenure and location as well as income is provided in Chapter 3. Housing affordability outcomes are covered in section 2.2 and financial stress outcomes in section 2.3. A summary overview of the relation between these two outcomes is provided in section 2.4.

### 2.2 Housing stress

Because Yates and Gabriel (2006) have provided a detailed analysis of housing stress for 2002-03, a period just one year earlier than the 2003-04 period covered by the HES, only a brief overview of outcomes for a limited number of key housing affordability indicators from the HES is given here. These will facilitate comparison with the results in Yates and Gabriel and will provide a benchmark against which the financial stress results can be assessed.

Table 2.1 provides estimates of numbers of households who are paying at least 30 per cent of their gross household income in meeting their housing costs and the incidence of such households, ranked according to gross household income decile. Households in the lowest 2 income quintiles and paying at least 30 per cent of their income in meeting their housing costs are those conventionally described as being in housing stress. This is popularly described as the 30/40 rule. These results for 2003-04 are directly comparable with those presented in Yates and Gabriel for 2002-03. They show that in 2003-04, 15 per cent of all households, amounting to 1,172,000 households, have significant housing affordability problems.<sup>10</sup> Of these, 719,000, or 23 per cent of those with the lowest 40 per cent of equivalent disposable household incomes, are in housing stress.<sup>11</sup>

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<sup>10</sup> This estimate is lower than the 1,215,000 households reported by the ABS (2005b, Table 3). This may arise from the effect of confidentialising the data on the CURF or it may arise because of the smaller sample in the HES compared with SIH. Median gross household income in the HES, for example, is \$14 per week higher than in the SIH (ABS, 2006c, Tables 4.2 and 4.3). This alone would contribute to a lower estimate of households with housing cost ratios in excess of 30 per cent of gross household income.

<sup>11</sup> For ease of exposition, in what follows the term 'housing stress' also will be used to describe all households spending at least 30 per cent of their gross household income on housing. In other words, it will include households in the top 3 income quintiles with high housing cost ratios. Most such households are marginal house purchasers and their high housing costs are seen as being just as likely to have an impact on their non-housing outcomes as for less well-off households who are more likely to be renting. Tenure differences will be discussed in the next chapter. The text will make it clear whether the term applies to all households or to those in the lowest 2 quintiles of the income distribution.

**Table 2.1: Numbers in and incidence of housing stress, 2003-04**

Equivalent disposable income quintile	Housing costs $\geq$ 30% gross h'hold income	
	%	('000s)
1	30	467
2	16	252
3	12	187
4	10	153
5	7	113
All households	15	1,172

source: HES 2003-04, confidentialised unit record file

Table 2.1 shows the same general pattern of housing affordability problems as reported in Yates and Gabriel. The incidence of high housing costs in relation to household income is highest for households in the lowest 40 per cent of the income distribution and declines rapidly for households in the top half of the income distribution.

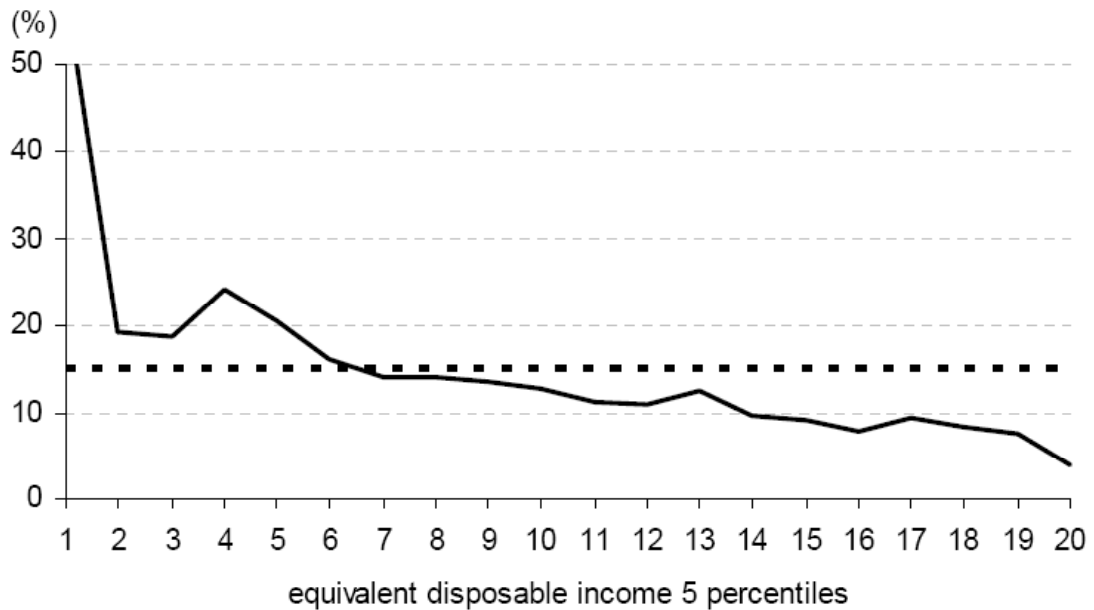
These numbers, whilst similar to those for 2002-03, suggest a marginal improvement in 2003-04 over the results from one year earlier. In 2002-03, there were 1,186,000 households (or 16 per cent of all households) paying at least 30 per cent of their gross household income in meeting their housing costs. Of these, 862,000 households, representing 28 per cent of all households in the lowest 2 quintiles of the equivalised household disposable income distribution, were in housing stress. The 2003-04 HES data reported above in Table 2.1 suggest there were 1,172,000 households (or 15 per cent of all households) paying at least 30 per cent of their gross household income in meeting their housing costs. Of these, 729,000 households, representing 23 per cent of all households in the lowest 2 quintiles of the equivalised disposable income distribution, were in housing stress. However in 2002-03, there were a further 164,000 households in the third income quintile paying at least 30 per cent of gross household income in meeting their housing costs. By comparison, in 2003-04 there were 187,000 households in the third income quintile paying at least 30 per cent of gross household income in meeting their housing costs. In both years, all but 20 per cent of households paying this high proportion of their income are in the first three quintiles of the disposable income distribution, and more than 60 per cent are in the first two quintiles.

Figure 2.1 provides a more detailed picture of the incidence of housing stress households in different income categories by disaggregating equivalent disposable household income into 5 percentile groupings rather than the quintiles reported above. Results are illustrated for all households, and by excluding those households with a housing cost ratio in excess of 80 per cent of their gross household income. Although the choice of 80 per cent as a cut off for outliers was somewhat arbitrary, it was selected because the vast majority of such cases had high housing ratios because they had incomes in the lowest income decile.

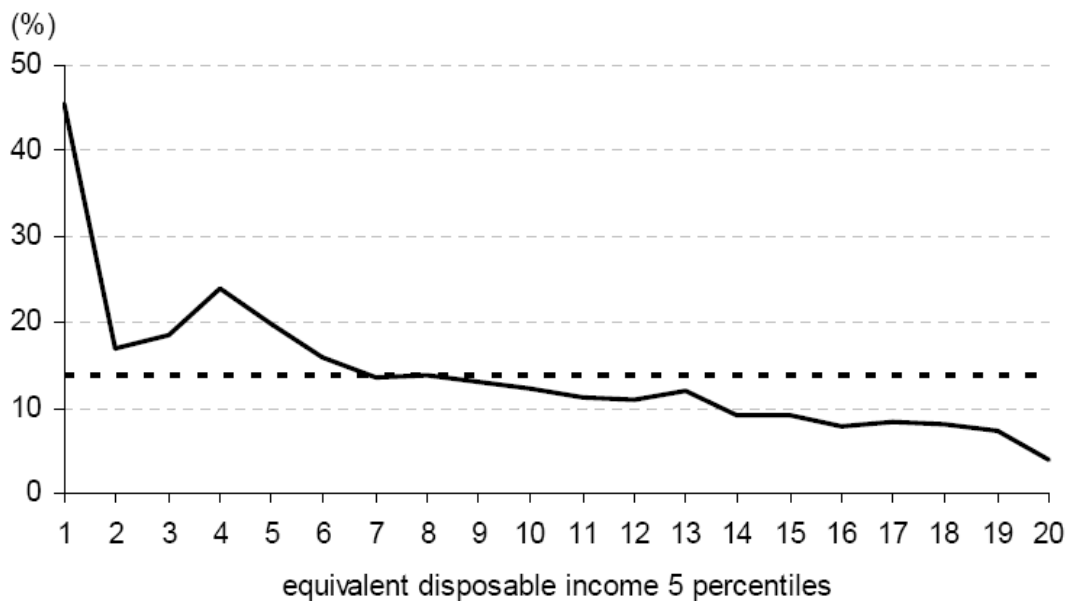


**Figure 2.1: Incidence of housing stress by household income, 2003-04**

**a: All households**



**b: Excluding households with housing cost ratios in excess of 80 per cent**



Source: HES 2003-04, confidentialised unit record file

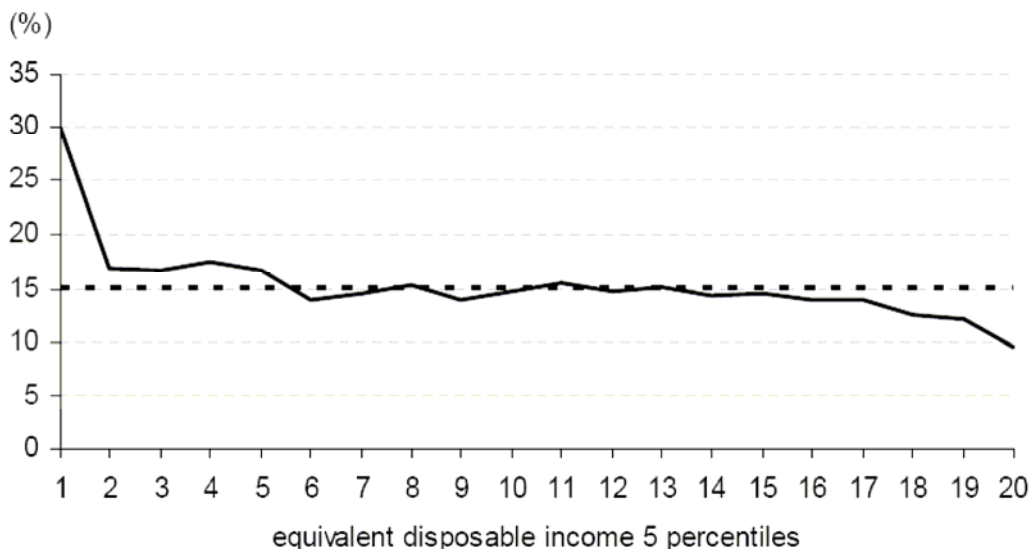
The ABS (for example, ABS, 2005c) often excludes all cases in the first income decile because of the unreliability of some of the data. Such a draconian approach was not employed here because many of those in the lowest income decile do have characteristics consistent with their reported incomes. The financial stress indicators used later in this paper will identify such households but the results illustrated in this chapter, whilst they suggest that outcomes for those in the lowest 5 per cent of the equivalent disposable income distribution should be treated with some caution, they also suggest there are good reasons for retaining them in the analysis. Cases with high housing cost ratios have been rejected because of the disproportionate impact

they have on the regression results presented later in this report. As can be seen from the results in Figure 2.1, their exclusion has little impact on the tabular results presented here.

Even more clearly than the results presented in Table 2.1, the results in Figure 2.1 show a strong correlation between a high incidence of housing stress and low equivalent disposable income. Only households in the lowest 6 income categories (equivalent to the lowest 3 deciles) have an above-average incidence of housing stress. These results also suggest that, whilst there is an obvious disparity between outcomes for the 5 per cent of households in the lowest income category charted (which includes all households with an equivalent disposable income of less than \$202 per week), the pattern of housing stress for the remaining 95 per cent of cases is credible. In the following analysis, the 1.7 per cent of cases where the housing cost ratio is in excess of 80 per cent have been discarded. Most, but not all, of these high ratios are explained by low incomes.

Figure 2.2 charts the average housing cost ratios faced by households for the same percentile groupings as in Figure 2.1. As indicated, this and all following results, are based on exclusion of cases where housing cost ratios are in excess of 80 per cent of gross household income. The average housing cost ratio for all households is just over 15 per cent. At the degree of aggregation reported in Figure 2.2 the average ratio for each of the income groups reported varies by more than 2 percentage points above or below this only for those with very low or very high incomes. In part, this arises because of the interaction of age and tenure with household incomes. More detailed data are provided in Chapter 3.

**Figure 2.2: Average housing cost ratios by household income, 2003-04\***



\* Excluding cases where housing cost ratios exceed 80 per cent.

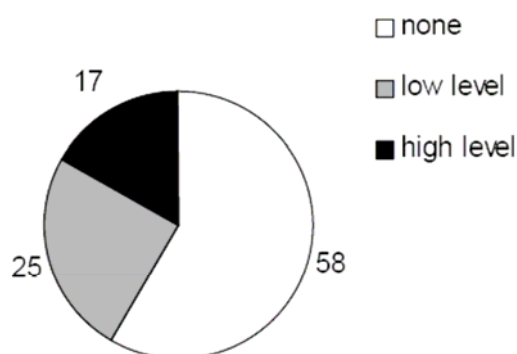
Source: HES 2003-04, confidentialised unit record file

### 2.3 Financial stress

An overview of outcomes for the various indicators of financial stress was provided in Chapter 1. The outcomes for the key summary indicators indicating no, low or high levels of financial stress are illustrated in Figure 2.3 below. As indicated in the previous chapter, 42 per cent of all households covered in the HES were classified as

being in some financial stress. Of these, 25 per cent experienced only low level financial stress and 17 per cent experienced high level financial stress.

**Figure 2.3: Incidence of financial stress**



Source: HES 2003-04, confidentialised unit record

Table 2.2 provides a breakdown of these results by equivalent disposable income quintile. The results in the final column describe all households with low financial stress or high financial stress (that is, some financial stress).

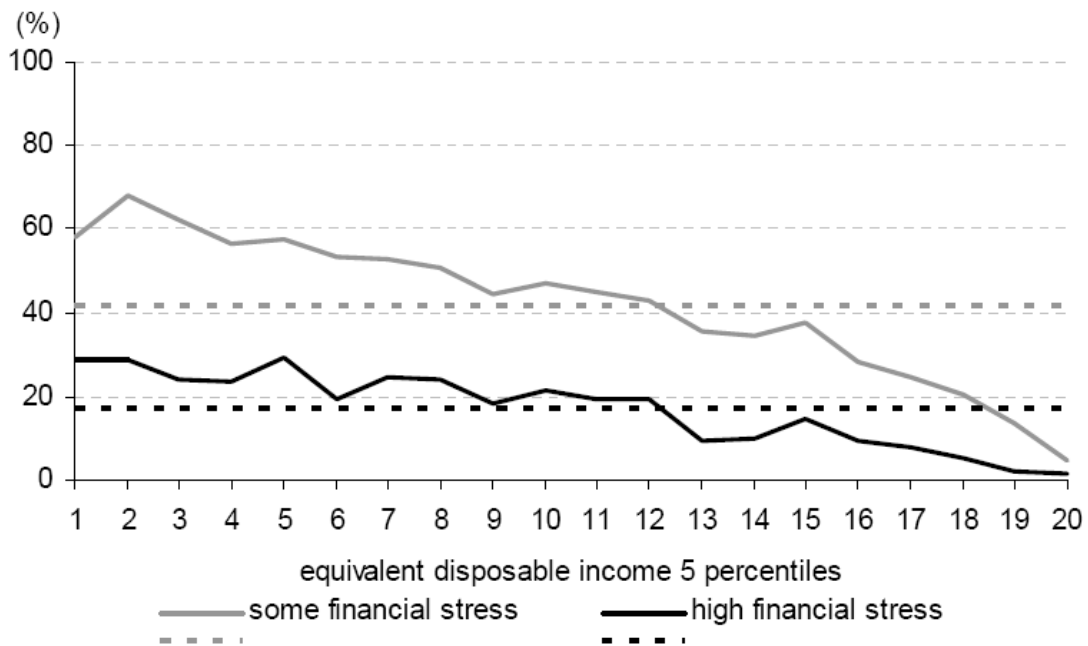
**Table 2.2: Numbers in and incidence of financial stress, 2003-04**

Equivalent disposable income quintile	Low financial stress		High financial stress		Some financial stress	
	%	('000s)	%	('000s)	%	('000s)
1	35	542	26	408	61	950
2	29	455	24	376	54	831
3	25	393	20	303	45	696
4	23	357	11	169	34	526
5	12	179	4	64	16	244
All households	25	1,926	17	1,320	42	3,246

Source: HES 2003-04, confidentialised unit record file

Figure 2.4 provides more detail by disaggregating equivalent disposable household income into 5 percentile groupings. Outcomes are charted for households with high financial stress and for all households with some financial stress.

**Figure 2.4: Incidence of financial stress by household income, 2003-04**



Source: HES 2003-04, confidentialised unit record file

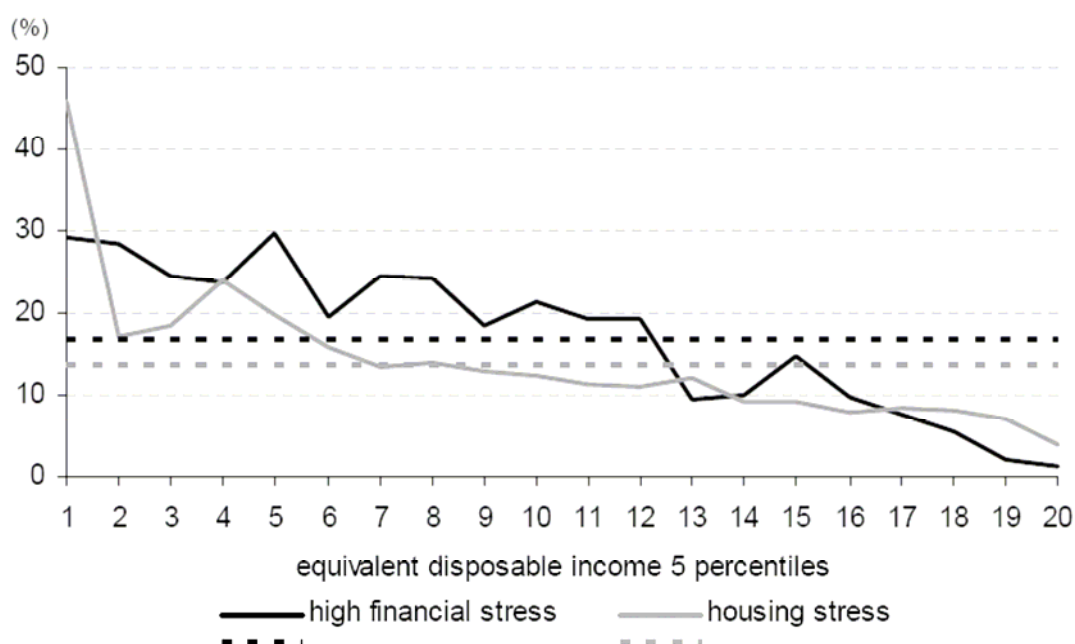
These results show that an above average incidence of both some financial stress and high financial stress is experienced by households in the lowest 12 income groups illustrated. This is equivalent to the lowest 3 income quintiles of the equivalent disposable income distribution. For households in the lowest 2 quintiles, the experience of some financial stress is significantly above average.

The experience of financial stress follows the same general pattern as that of housing stress: that is, it declines steadily with increases in income, with a more rapid decline for households reporting some financial stress than for those reporting high financial stress. The relationship between housing and financial stress is examined in section 2.4 below.

## 2.4 Housing and financial stress

This common pattern between housing stress and financial stress on either measure is illustrated in Figure 2.5 for high financial stress only. This shows above average high financial stress is relatively more pervasive than above average housing stress for households in the low to middle income groups (in quintiles 2 and 3). The well above-average incidence of high financial stress amongst very low income households with high housing cost ratios lends support to claims that some low income households do have difficulties in meeting their non-housing needs. It also provides some justification for not discarding information on these households simply because their standard of living is above that consistent with their reported levels of income.

**Figure 2.5: Incidence of housing stress and high financial stress by income\*, 2003-04**



\* Excludes cases where housing cost ratios exceed 80 per cent

Source: HES 2003-04, confidentialised unit record

The interaction between the indicators for housing and financial stress can be seen below in Table 2.3, which breaks down these results by whether households experiencing different levels of financial stress are spending less or at least 30 per cent of their household income in meeting their housing costs.

**Table 2.3: Housing and financial stress, 2003-04**

Financial stress indicators	Housing stress indicators				All households	
	< 30% h'hold income		30% h'hold income			
	%	('000s)	%	('000s)	%	('000s)
no financial stress	61	3,980	43	4,489	58	4,489
low level financial stress	24	1,592	29	1,926	25	1,926
high level financial stress	15	992	28	1,320	17	1,320
All households ('000s)	100	6,564	100	7,736	100	7,736

Source: HES 2003-04, confidentialised unit record

The first point that can be made from the results in this table is that the proportion of households who experienced no financial stress is considerably lower for households who face an affordability problem than it is for those who do not face an affordability problem: 57 per cent of households in housing stress experience some financial stress, whereas only 39 per cent of those who are not in housing stress experience some financial stress.

This disparity increases with the severity of housing stress as reflected in the low level compared with high level indicators. The overall proportion of households experiencing low levels of financial stress who are in housing stress is just 5 percentage points higher than those who are not in housing stress (29 per cent compared with 24 per cent). However, the overall proportion of households

experiencing high levels of financial stress who are in housing stress is almost double that of those who are not in housing stress (28 per cent compared with 15 per cent).

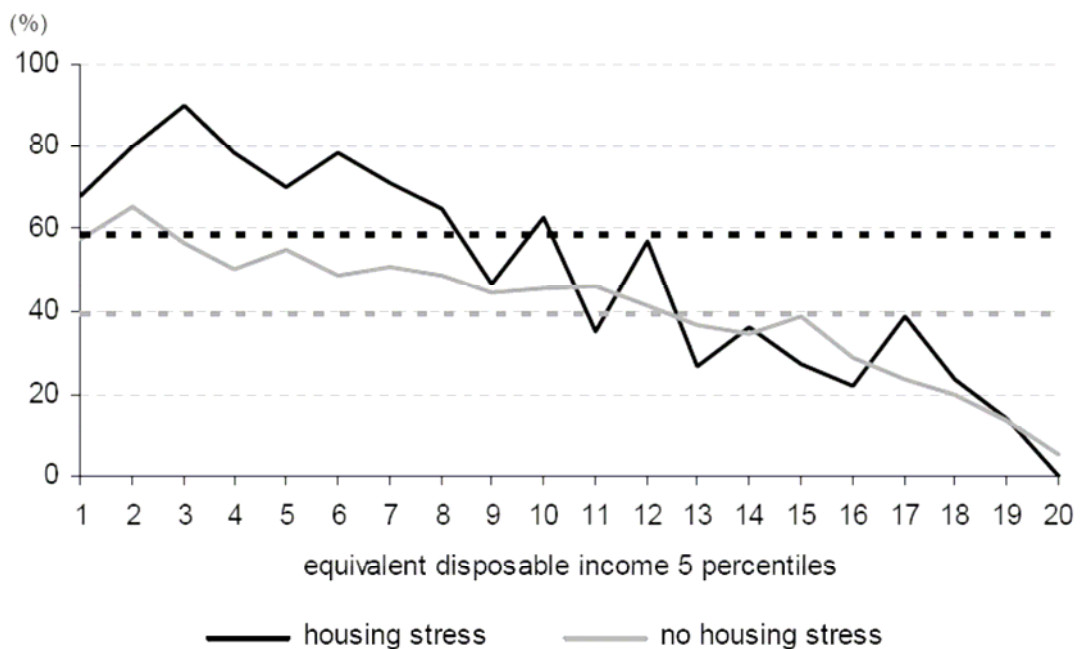
The significant impact of high housing costs on the incidence of financial stress is highlighted by the results in Figure 2.6. The top half of the figure illustrates the incidence of some financial stress both for households with housing cost ratios in excess of 30 per cent and for those with relatively more affordable housing costs. The lower half illustrates the same outcomes for the incidence of high financial stress.

These results clearly highlight the much greater propensity of households with high housing cost ratios to experience significantly higher levels of financial stress than households whose housing cost ratios do not exceed 30 per cent. In marked contrast to an overall average incidence of 42 per cent, the average incidence of some financial stress is 57 per cent for households with housing cost ratios of at least 30 per cent, and only 39 per cent for those whose housing cost ratios do not exceed this. Likewise, as reported in Table 2.3, the average incidence of high financial stress for households with housing cost ratios of at least 30 per cent is 28 per cent. The average incidence of households with housing cost ratios that do not exceed 30 per cent is 15 per cent.

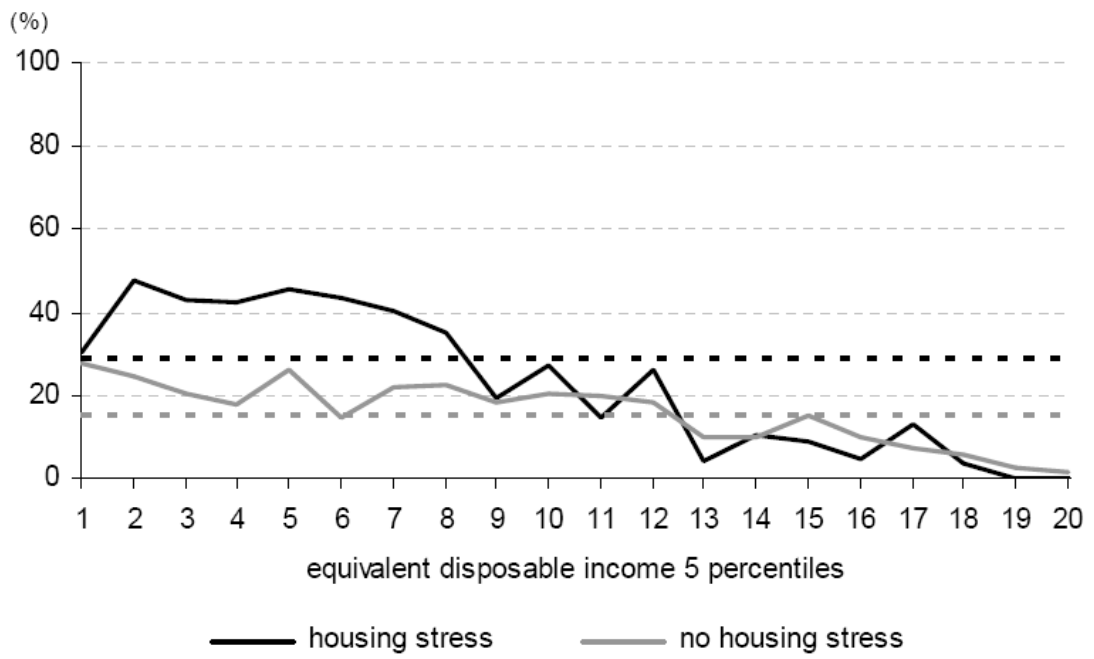
The disaggregate results illustrated below in Figure 2.6 clearly show that these disparities arise solely because of the difference in outcomes for households in housing stress; that is, in the lowest 2 quintiles of the equivalent disposable household income distribution.

**Figure 2.6: Incidence of financial stress by housing stress and income\*, 2003-04**

**a. Some financial stress**



**b. High financial stress**



\* Excludes cases where housing cost ratios exceed 80 per cent

Source: HES 2003-04, confidentialised unit record

### 3 DISAGGREGATE RESULTS

The results in Chapter 2 showed that in the period covered by the 2003-04 Household Expenditure Survey, the majority (58 per cent) of households experienced no financial stress. However results also showed that the proportion of households who experienced financial stress was higher for households who faced a housing affordability problem compared with those who did not, with 57 per cent of those who are in housing stress also being in some financial stress, compared with only 39 per cent of those who are not in housing stress.

This chapter further disaggregates the results to identify the characteristics of those facing financial stress and, in particular, to determine the characteristics of those facing both financial and housing stress. It focuses specifically on the relations between financial stress, housing stress and age, household income, household type and tenure.

Section 3.1 below provides an overview of the housing stress outcomes by income, age, household type and tenure as derived from the 2003-04 HES data after deleting cases where housing cost ratios exceed 80 per cent.<sup>12</sup> Sections 3.3 to 3.5 provide an overview of factors that explain which households are likely to be in financial stress, and relate financial stress outcomes to housing stress outcomes. The focal point of the analysis however is in section 3.6, which concludes this chapter by addressing the question of whether housing stress has an independent effect on financial stress.

#### 3.1 Housing stress by risk factors

When the 1.7 per cent of households with housing cost ratios are excluded from the analysis, the proportion of all households with housing cost ratios of at least 30 per cent of gross household income decreases from more than 15 per cent to just under 14 per cent. The results illustrated in Figure 3.1 are presented against this latter benchmark.

Figure 3.1 provides a visual summary of the results presented and discussed in more detail in an earlier NRV3 Research Paper (Yates and Gabriel, 2006). In broad terms, the risk of a household facing a high housing cost ratio is greatest for households in the lowest equivalent income quintile, households younger than 25, sole parent households and those in private rental. Compared to the overall average for all households, these are almost twice as likely to have a housing cost ratio of at least 30 per cent of income. The risk of having a high housing cost ratio decreases significantly as (equivalent disposable) income increases, and as households age. It decreases even more significantly as households move from home purchase into outright ownership and is lower for those in public rental than private rental.

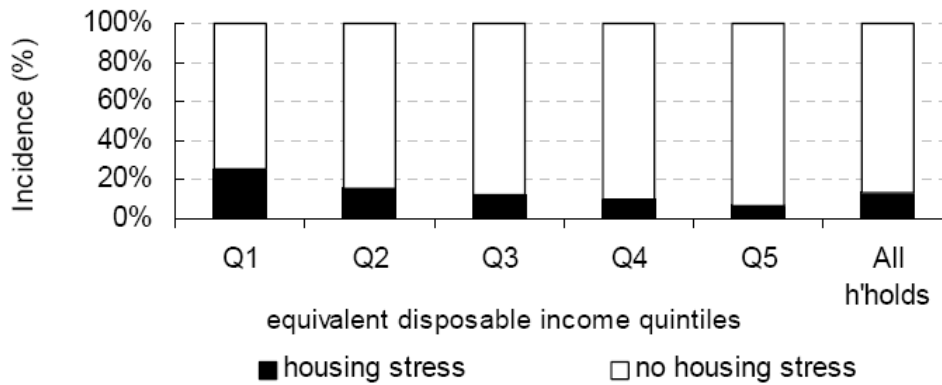
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<sup>12</sup> As indicated in Chapter 2, these extreme housing cost ratios are deleted because of the unreliability of the income data used to estimate them.

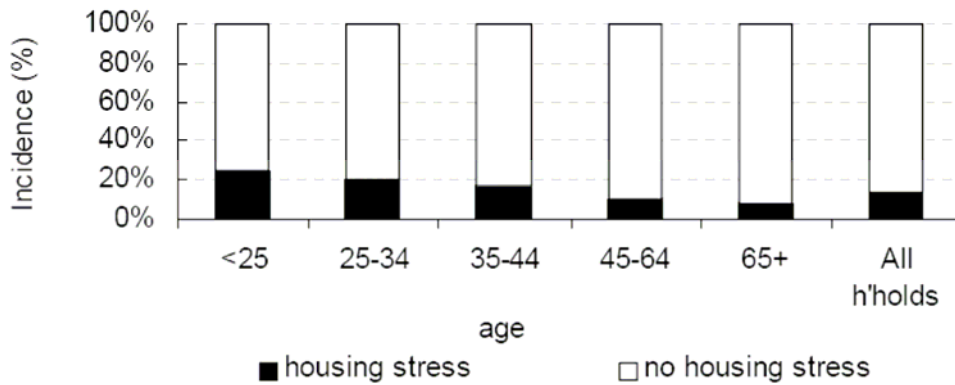


**Figure 3.1: Incidence of housing stress by key risk factors, 2003-04**

**a: Income**



**b: Age**



**c: Household type**



**d: Tenure**

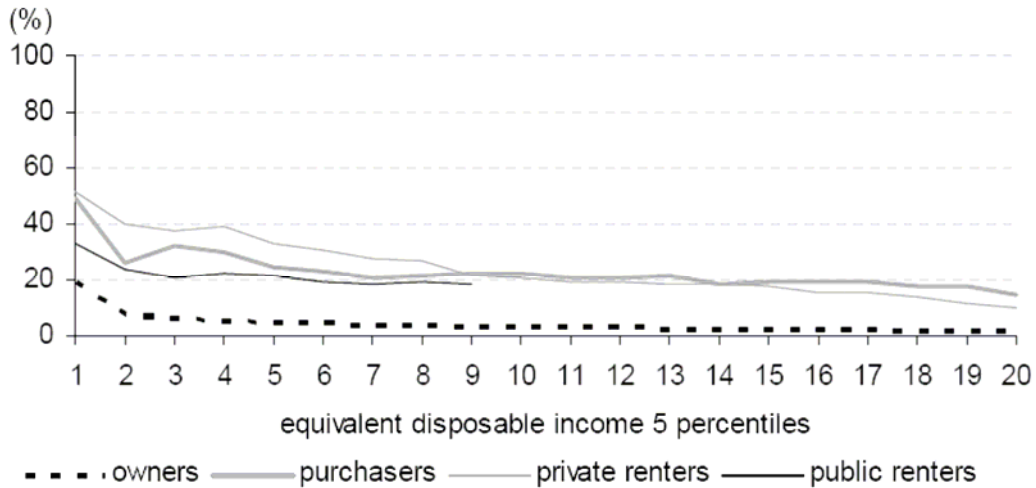


Source: HES 2003-04, confidentialised unit record file

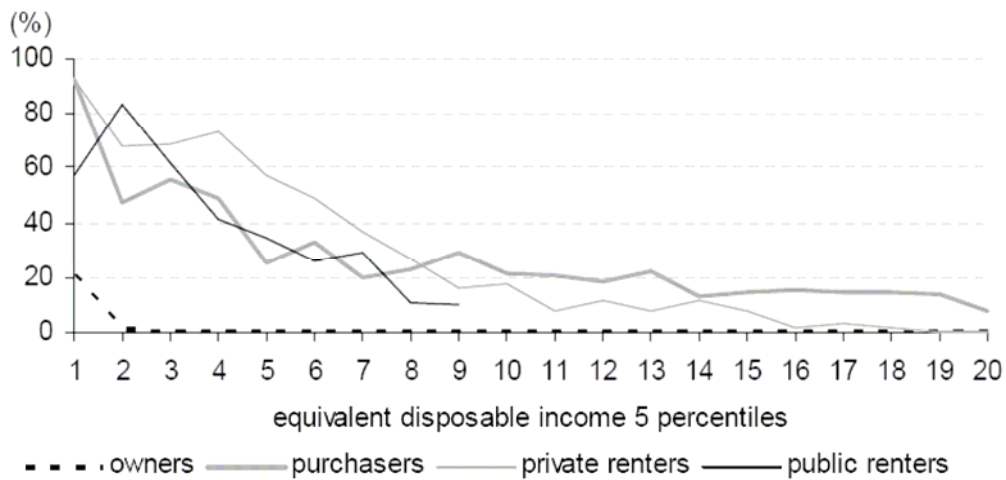
To a large extent, the outcomes summarised in Figure 3.1 are interdependent. Young households are more likely to have low income, to be single and to rent in the private market than, for example, older households. These potential interactions are taken into account in the formal analysis presented in the final section of this chapter. An indication of their interaction, however, can be seen below in Figure 3.2. This illustrates the extent to which the average housing costs ratios and the resultant incidence of housing stress vary by household income and tenure.

**Figure 3.2: Housing costs and housing stress by income, 2003-04**

**a: Average housing cost ratios**



**b: Proportions with housing cost ratios of at least 30 per cent**



Source: HES 2003-04, confidentialised unit record file

### 3.2 Financial stress and housing stress by income

Table 3.1 and Figure 3.3 repeat results that were presented in more detail in Chapter 2. These show the relationship between financial stress and income. Here they are presented in a form that enables a direct comparison with the results presented in this chapter for risk factors other than income. They highlight the extent to which there is a systematic pattern in the relationship between the incidence of financial stress and household income. Low to moderate income households are likely to have a disproportionately high incidence of both low and high level financial stress that is

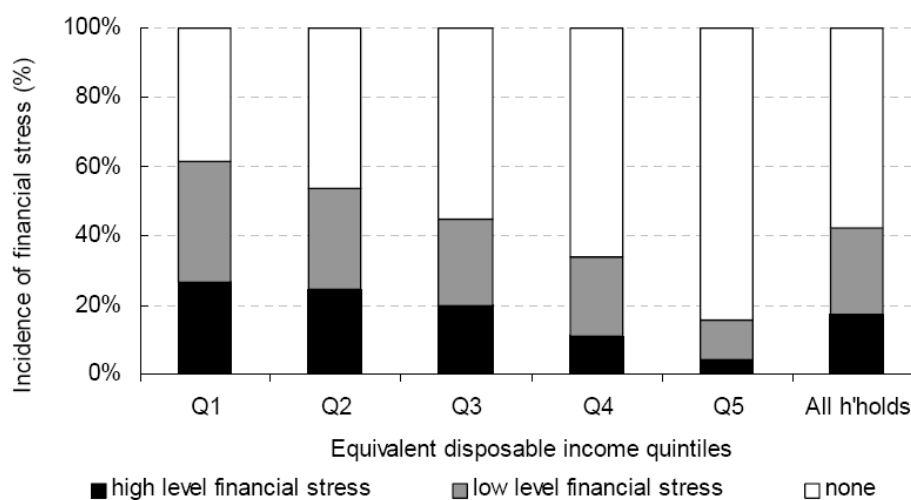
marginally above average. High income households, on the other hand, have well below average levels of any form of financial stress.

**Table 3.1: Incidence of financial stress by gross household income, 2003-04**

Level of financial stress	equivalent disposable income quintile					All households
	Q1	Q2	Q3	Q4	Q5	
	%	%	%	%	%	%
none	39	46	55	66	84	58
low	35	29	25	23	12	25
high	26	24	20	11	4	17
no. households ('000s)	1,547	1,547	1,547	1,548	1,547	7,736

Source: HES 2003-04, confidentialised unit record file

**Figure 3.3: Financial stress by household income, 2003-04**



Source: HES 2003-04, confidentialised unit record file

As also illustrated in the previous chapter, disaggregation by household income and by housing stress provides a slightly less sanguine outcome. The results by income quintile are presented in Table 3.2 and illustrated in Figure 3.4. The first point that can be re-iterated from the results is that housing stress (defined broadly to include all households paying at least 30 per cent of their income in meeting their housing costs) is not a problem for high income households.

**Table 3.2: Financial stress by household income and housing stress, 2003-04**

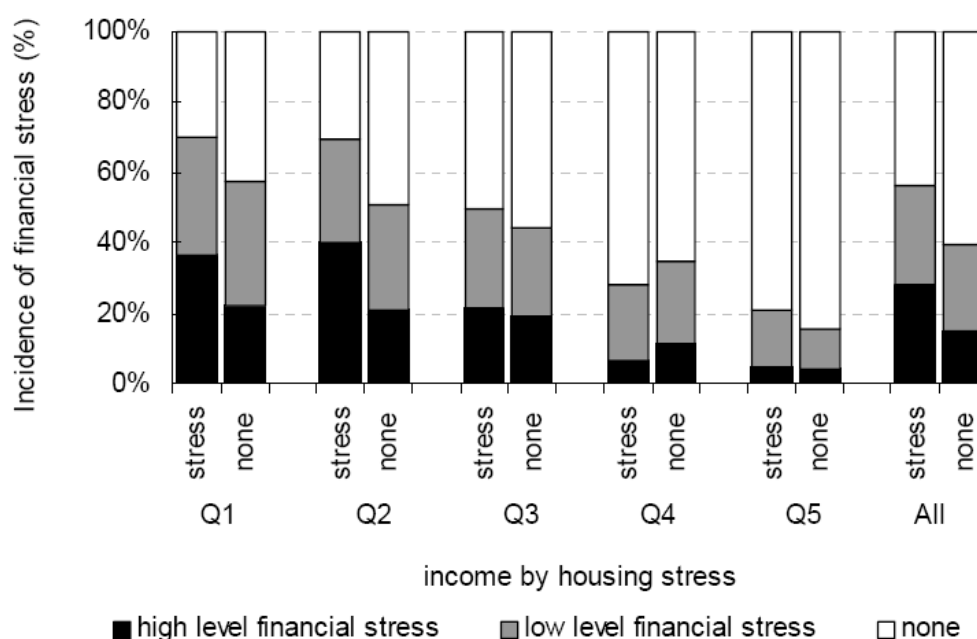
Financial stress	equivalent disposable income quintile					All h'holds
	Q1	Q2	Q3	Q4	Q5	
	%	%	%	%	%	%
<i>No housing stress</i>						
none	42	49	56	65	85	61
low	36	29	25	23	11	24
high	22	21	19	11	4	15
All with no housing stress ('000s)	1,080	1,296	1,360	1,395	1,434	6,564
<i>Housing stress</i>						
none	30	31	50	72	79	43
low	34	29	28	21	16	29
high	37	40	22	7	5	28
All with housing stress ('000s)	467	252	187	153	113	1,172
<i>All households</i>						
none	39	46	55	66	84	58
low	35	29	25	23	12	25
high	26	24	20	11	4	17
All households ('000s)	1,547	1,547	1,547	1,548	1,547	7,736

Source: HES 2003-4, confidentialised unit record file

As can be seen from the middle set of rows in Table 3.2, fewer than 10 per cent of households in housing stress had incomes in the top 40 per cent of the (gross) household income distribution. In other words, all but 86,000 of the 954,000 recorded as having housing affordability ratios in excess of 30 per cent of gross household income were low to moderate income households in the first 3 quintiles of the income distribution. More than 700,000 of them (approximately 75 per cent of all households with high housing cost ratios) have incomes that place them in the lowest 40 per cent of the household income distribution.

The results below in Figure 3.4 show the more uneven distribution of financial stress once housing stress is taken into account. Whilst these data do not prove causality, they provide a strong case for the argument that high housing costs are a significant contributing factor to the likelihood that lower income households will experience financial stress. The results in Figure 3.4 (and earlier in Figure 2.6) suggest that, for lower income households at least, high housing costs are associated with a high level of financial stress. For households in the top three quintiles, the relationship between housing stress and financial stress is less clear with a higher incidence of financial stress for households not spending a high proportion of their incomes in meeting their housing costs than is the case for those households who do have high housing cost ratios.

**Figure 3.4: Financial stress by gross household income and housing stress**



Source: HES 2003-04, confidentialised unit record file

### 3.3 Financial stress and housing stress by age

Table 3.3 below provides a breakdown of the incidence of financial stress by level of housing stress and age of household using the same approach as employed in section 3.2. Figure 3.5 illustrates these results. Together these show a strong pattern: younger households are more likely to face high levels of financial stress than are older households. Only 4 per cent of households in the 65 and over age group experience a high level of financial stress, while 36 per cent of young households experience high level financial stress. Young households aged less than 25 years old have a high level of financial stress that is more than double the average level for all households.

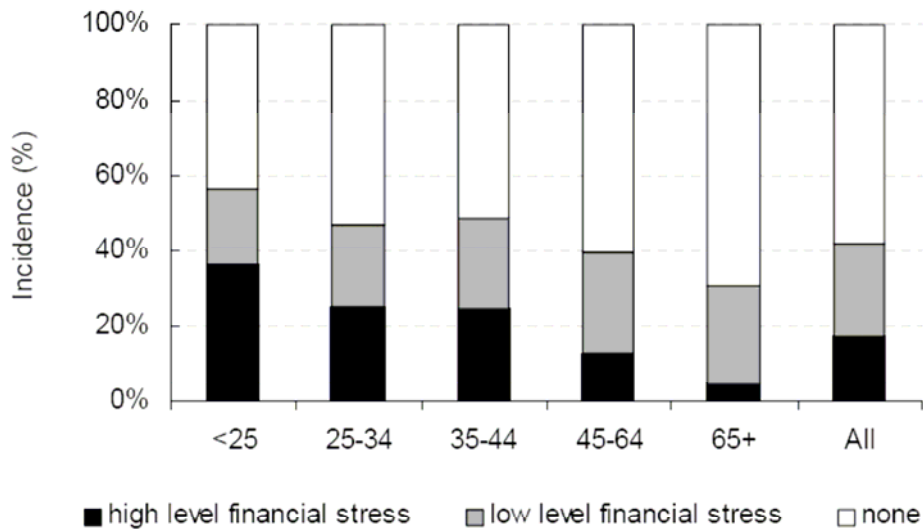
**Table 3.3: Incidence of financial stress by age, 2003-04**

Level of financial stress	age					All h'holds
	<25	25-34	35-44	45-64	65+	
none	43	53	51	60	69	58
low level	20	22	24	27	26	25
high level	36	25	25	13	4	17
no. households ('000s)	334	1,406	1,735	2,720	1,541	7,736

Source: HES 2003-04, confidentialised unit record file

The proportion of households facing high financial stress declines with age but only slowly until age 45. Thereafter, its declines are partially offset by slight increases in the proportion of households facing low level stress, although the net effect is still a significant decline in the proportion of over 45s facing any form of financial stress. As seen by comparison with the results shown in Table 3.1 and Figure 3.3, there is greater variation in the experience of some level of financial stress when results are disaggregated by income than when they are disaggregated by age.

**Figure 3.5: Financial stress by age, 2003-04**



Source: HES 2003-04, confidentialised unit record file

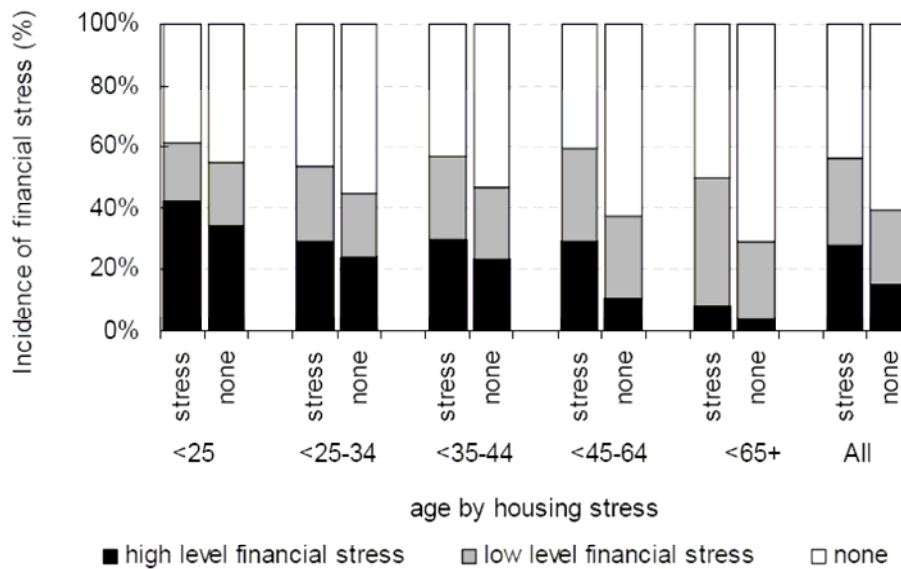
Table 3.4 further disaggregates these results by whether or not these households also experienced housing stress. It shows the proportion of households with different levels of financial stress according to whether they are in housing stress or not. Figure 3.6 illustrates the data presented in Table 3.4.

**Table 3.4: Financial stress by housing stress and age, 2003-04**

Financial stress	Age Group					All
	<25	25-34	35-44	45-64	65+	
	%	%	%	%	%	%
<i>No housing stress</i>						
none	45	55	53	63	71	61
low	21	21	23	26	25	24
high	34	24	23	11	4	15
All with no housing stress ('000s)	239	1,104	1,411	2,398	1,412	6,564
<i>Housing stress</i>						
none	39	46	43	40	50	43
low	19	25	27	31	42	29
high	42	29	30	29	8	28
All with housing stress ('000s)	95	302	323	322	129	1,172
<i>All households</i>						
none	43	53	51	60	69	58
low	20	22	24	27	26	25
high	36	25	25	13	4	17
All households ('000s)	334	1,406	1,735	2,720	1,541	7,736

Source: HES 2003-04, confidentialised unit record file

**Figure 3.6: Financial stress by age and housing stress, 2003-04**



Source: HES 2003-04, confidentialised unit record file

The results suggest that, whilst the overall incidence of housing and financial stress is greatest for younger households, the impact of housing stress on financial stress is greater for older households in the two older age groups. In broad terms, of the younger households with heads aged less than 25 years who are in housing stress, 61 per cent are also in financial stress, and 42 per cent are facing what have been defined as high levels of financial stress. Lower levels of financial stress carry through to those households aged 25-34 who are in housing stress, with 54 per cent of these households facing some level of financial stress and 29 per cent facing high levels of financial stress. For households in the 45-64 year old age bracket, however, of those who are in housing stress, this increases to 60 per cent with 29 per cent facing high levels of financial stress. For the 65+ age group, half of those who are in housing stress are also in financial stress. For these households, however, the proportion with a high level of financial stress is a relatively low 8 per cent.

In other words, these results in this section highlight the greater tendency for a higher proportion of households at every age to be in financial stress if they are also in housing stress.

### 3.4 Financial stress and housing stress by household type

As in the two previous sections, in this section the HES results are disaggregated by household type with results presented first for financial stress by household type and, secondly, for financial stress by housing stress and household type. Table 3.5 provides the raw data and Figure 3.7 indicates the underlying pattern for the first of these disaggregate results. Data for multiple family households and group households are difficult to interpret, since the characteristics of the reference person in the household do not necessarily reflect that of the prime economic unit in the household, and hence do not necessarily reflect the characteristics that influence housing outcomes for the household. For this reason, the following analysis will focus primarily on the remaining four household types: viz. couples, couples with children, single person and sole parents.

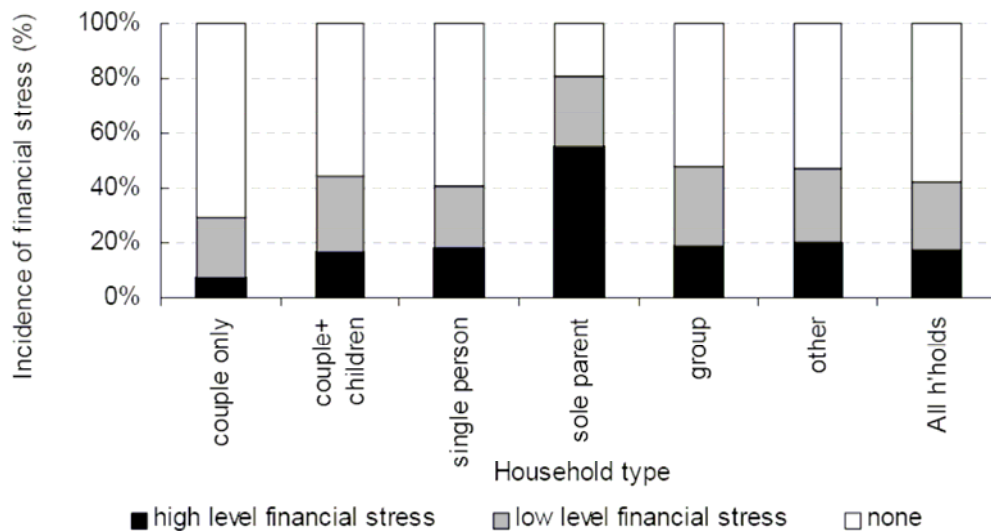
**Table 3.5: Incidence of financial stress by household type**

Level of financial stress	household type						All h'holds
	couple only	couple+ children	single person	sole parent	group	other	
	%	%	%	%	%	%	
none	71	55	59	19	52	53	58
low level financial stress	22	28	23	26	30	27	25
high level financial stress	7	17	18	55	18	20	17
no. households (000s)	2,119	2,533	1,962	510	231	380	7,736

Source: HES 2003-04, confidentialised unit record file

The results in Table 3.5 and Figure 3.7 show that the highest incidence of financial stress is felt by sole parent households, with 4 out of every 5 such households experiencing some financial stress and more than 1 in 2 experiencing a high level of financial stress. The greatest numbers of households experiencing high levels of financial stress, however, are households with children. There are 1.1 million such households (45 per cent of all couples with children) facing some level of financial stress and more than 400,000 (17 per cent) facing a high level of financial stress. In total there are just over 1.5 million households with children who experience some level of financial stress, half of whom experience a high level of financial stress.

**Figure 3.7: Financial stress by household type, 2003-04**



Source: HES 2003-04, confidentialised unit record file

Table 3.6 provides the incidence of financial stress for households according to their housing stress status. Figure 3.8 illustrates the results of disaggregating the incidence of financial stress by household type and by housing stress.



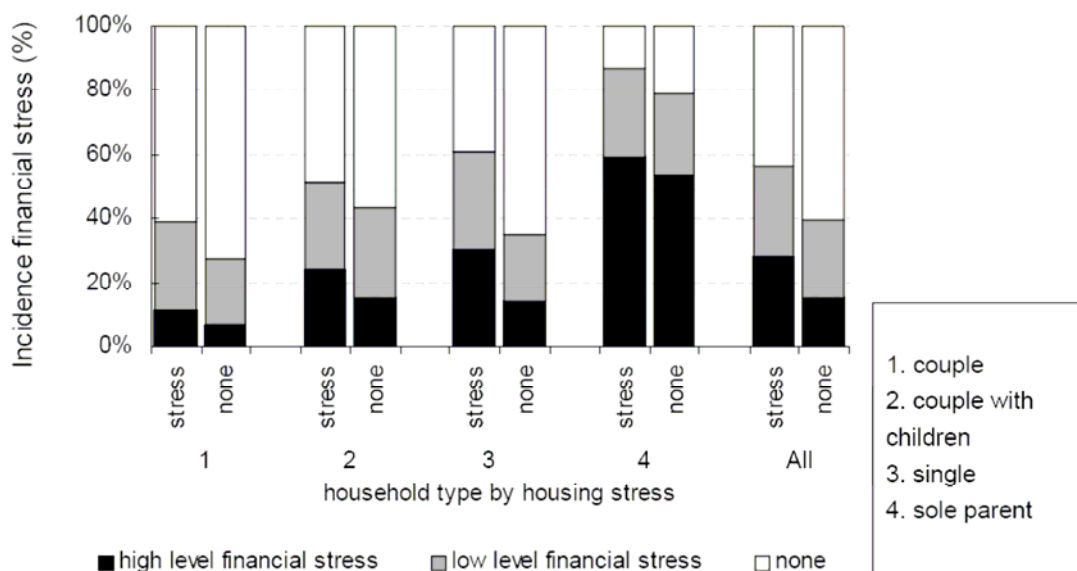
**Table 3.6: Incidence of financial stress by household type and housing stress, 2003-04**

Level of financial stress	household type						All h'holds	
	couple only	couple+ children	single person	sole parent	group	other		
<i>No housing stress</i>								
none	72	57	65	21	53	53	61	
low	21	28	21	25	29	27	24	
high	7	15	14	54	18	20	15	
All with no housing stress ('000s)	1,909	2,193	1,529	389	193	351	6,564	
<i>Housing stress</i>								
none	61	48	39	13	45	48	43	
low	28	27	30	27	33	25	29	
high	11	24	31	59	22	27	28	
All with housing stress ('000s)	211	340	433	121	38	29	1,172	
<i>All households</i>								
none	71	55	59	19	52	53	58	
low	22	28	23	26	30	27	25	
high	7	17	18	55	18	20	17	
All households ('000s)	2,119	2,533	1,962	510	231	380	7,736	

Source: HES 2003-04, confidentialised unit record file

Again Table 3.6 and Figure 3.8 highlight the significantly higher incidence of financial stress among sole parent households. This holds whether or not they are in housing stress, although it is slightly lower for those who are not in housing stress. For the other 3 household types illustrated, there is a markedly higher incidence of financial stress amongst households who are also in housing stress.

**Figure 3.8: Financial stress by household type and housing stress**



Source: HES 2003-04, confidentialised unit record file

### 3.5 Financial stress and housing stress by tenure

The final disaggregate results to be presented in this chapter relate to tenure. The results showing the incidence of financial stress disaggregated by tenure are reported

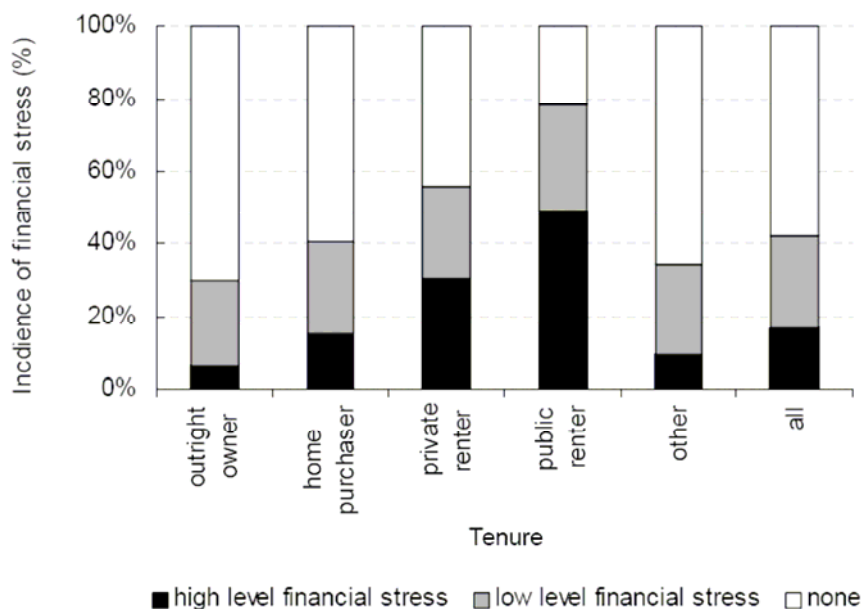
in Table 3.7 and illustrated in Figure 3.9. Consistent with the higher propensity for younger persons and single person or sole parent households to be renters rather than owners, and with the higher incidence of financial stress exhibited by such households, the disaggregation by tenure shows that renter households have a significantly higher incidence of financial stress than do owners (whether outright or purchasing). Outright owners experienced the lowest levels of financial stress with only 30 per cent reporting any financial stress, well below the overall 42 per cent figure for all households. The proportion of home purchasers reporting some financial stress was higher, at 40 per cent, but still below the overall average. The highest incidence of financial stress was reported amongst renters, with more than 1 in 2 private renters (56 per cent) and nearly 4 out of every 5 public renters (79 per cent) reporting some level of financial stress. Almost half of those in public rental housing reported high levels of financial stress.

**Table 3.7: Incidence of financial stress by tenure, 2003-04**

Level of financial stress	tenure					All h'holds
	outright owner	home purchaser	private renter	public renter	other	
	%	%	%	%	%	%
none	70	60	44	21	66	58
low	24	25	25	30	25	25
high	6	15	31	49	9	17
No. households ('000s)	2,703	2,714	1,749	378	192	7,736

Source: HES 2003-04, confidentialised unit record file

**Figure 3.9: Financial stress by tenure, 2003-04**



Source: HES 2003-04, confidentialised unit record file

Further disaggregation of these results according to whether the household is experience housing stress or not are provided in Table 3.8. Because outright owners have no mortgage costs, there are relatively few who have high housing cost ratios. For those who do, however, there is little impact of these high housing costs on the proportions experiencing financial stress. A similar result holds for public renters

whose high levels of reported financial stress are virtually unaffected by whether or not they are in housing stress. Again, as with home owners, the cost structure of public rental means very few are in housing stress (as defined by housing costs at least 30 per cent ratio of gross household income).

**Table 3.8: Incidence of financial stress by tenure and housing stress**

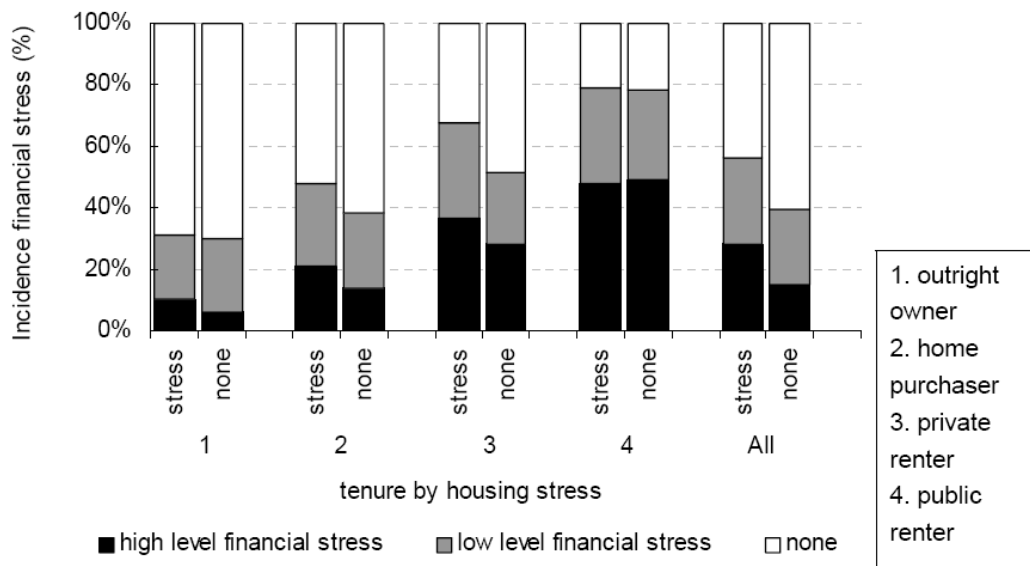
Level of financial stress	tenure						All h'holds
	outright owner	home purchaser	private renter	public renter	other		
<i>No housing stress</i>							
none	70	62	48	21	66		61
low	24	25	23	30	24		24
high	6	14	28	49	9		15
All with no housing stress ('000s)	2,653	2,112	1,275	334	191		6,564
<i>Housing stress</i>							
none	69	52	32	21	0		43
low	21	27	31	31	100		29
high	10	21	37	48	0		28
All with housing stress ('000s)	50	602	474	44	1		1,172
<i>All households</i>							
none	70	60	44	21	66		58
low	24	25	25	30	25		25
high	6	15	31	49	9		17
All households ('000s)	2,703	2,714	1,749	378	192		7,736

Source: HES 2003-04, confidentialised unit record file

For purchasers and private renters, however, the differences are significant. There is almost a 25 per cent increase in the incidence of financial stress for home purchasers in housing stress (from 39 per cent of purchasers not in stress reporting financial stress to 49 per cent of purchasers in stress reporting financial stress), and a 33 per cent difference for those in private rental (with 51 per cent private renters not in housing stress reporting financial stress and 68 per cent of private renters in housing stress reporting financial stress).

These results, illustrated in Figure 3.10, again suggest that being in housing stress increases the propensity to report financial stress for most households. With the exceptions of the tenures noted above where, by definition, few households are in housing stress, the incidence of financial stress is higher for households who are in housing stress than it is for households not in housing stress.

**Figure 3.10: Financial stress by tenure and housing stress, 2003-04**



Source: HES 2003-04, confidentialised unit record file

### 3.6 Multivariate analysis of financial and housing stress

The disaggregated results above clearly show an apparent relationship between housing stress and financial stress for each of the key variables analysed (age, income, household type and tenure). These variables are highly inter-related and all are key to identifying the characteristics of those most at risk of experiencing housing stress and financial stress. Because of these interrelationships, it is possible (for example) that the propensity of the young who are in housing stress also to be in financial stress is simply a result of their low household incomes. Likewise, the apparent correlation between those in housing stress in private rental and their propensity to be in financial stress may arise from the disproportionate share of young, single or sole parent households who live in the private rental market. Whether it is possible to untangle their effects and to separately identify the extent to which housing stress causes financial stress has yet to be addressed.

This summary section provides a multivariate analysis of the relationship between financial stress and the variables that potentially explain the propensity to be in financial stress. Housing stress is only one of those variables. The key purpose of this analysis is to determine whether it is possible to identify the effect that housing stress has on the likelihood that a household will experience financial stress over and above that which arises from the common factors that explain both housing stress and financial stress.

The results below are based on a logistic regression model, with the probability of being in some or high financial stress modelled separately as the dependent variables. Independent variables for age, income, household type and tenure are expressed as dummy variables for each of the categories reported in the tabular

results above.<sup>13</sup> Results are presented relative to the outcome for an outright owner couple-only household in the highest income quintile.<sup>14</sup> Additional variables included in the regressions but not reported in the tabular results presented above relate to the employment status of the reference person in the household and to their location, which is defined by state and whether or not the household was located in the capital city or not.<sup>15</sup> Results for these variables are presented relative to households not in employment and living in non-metropolitan Tasmania. Two different definitions were used for housing stress: in the first case (reported in Table 3.9), housing stress was treated as a dichotomous variable, with stress defined as “1” for households paying at least 30 per cent or more of their income in meeting their housing costs and “0” otherwise.<sup>16</sup> In the second case (reported in Table 3.10), actual housing cost ratios were included as a continuous variable. In both cases, 1.7 per cent of households with housing costs in excess of 80 per cent of household income were excluded from the analysis as outliers. The choice of 80 per cent was arbitrary. The effects of this exclusion were to reduce the proportion of households with housing costs of 30 per cent or more from 15 per cent to 14 per cent, and to reduce the sample size by 109 from 6,957 to 6,848.

Because the coefficients of a logistic regression model are difficult to interpret, the results presented give the marginal effects for each of the independent variables and the log-odds ratios. The marginal effects are all evaluated at the means of the variables in sample used for the model estimated (shown in the final column of the results). For the dummy variables used in the estimation, they show the change in the probability of being in financial stress as each variable changes from 0 to 1 (with all other variables held constant at their mean values). The log-odds ratios indicate the relative probability that a household with the characteristic in question will be in financial stress, compared to the benchmark household. Thus, an odds ratio of 3 suggests that, if all other characteristics are unchanged, the household identified is 3 times more likely to be in financial stress than is the benchmark household. An odds ratio of <1 means the household in question is less likely to be in financial stress.

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<sup>13</sup> The equations were estimated using the Logit procedure in Limdep, version 8. Household weights have been used as scale variables. Regressions were also run with income as a continuous variable. Whilst the results were marginally improved on those presented they were not substantively different and are not reported. To avoid the estimation problems that arise from the multi-collinearity inherent when dummy variables are employed for categorical data, one case for each category must be excluded from the regression and taken as the base case. In most cases, the base case was taken as that category with the lowest reported level of financial stress as reflected in the descriptive tables above. This was done to facilitate interpretation of the estimated coefficients.

<sup>14</sup> Equations were estimated for both gross income quintiles and equivalised disposable income quintiles but results differed little. Those presented hold related to gross income quintiles since household structure has been taken into account separately in the regression. Results based on equivalent income quintiles are presented in Appendix A.

<sup>15</sup> Data for ACT and NT have been excluded because they were combined in the HES and the capital city definition was not applicable. This resulted in a further reduction of the sample by an additional 634 cases.

<sup>16</sup> Although the definition of housing stress conventionally applies only to households in the lowest 2 quintiles of the income distribution, for the results presented here, it is assumed to apply to any household paying at least 30 per cent of income in meeting housing costs. Results based on the conventional definition are discussed in the text.

**Table 3.9: Marginal effects and odds ratios of being in financial stress, 2003-04: dummy housing stress variable**

Variable	High level financial stress			Some financial stress			Mean of X
	Marginal effects	b/se	Log odds	Marginal effects	b/se	Log odds	
Constant	-0.54	-18.87 **		-0.82	-14.83 **		1.00
STRESS	-0.01	-0.99	0.90	0.00	-0.21	0.98	0.14
quintile 1	0.36	8.41 **	9.58	0.58	28.63 **	16.29	0.19
quintile 2	0.26	8.32 **	6.12	0.47	21.97 **	8.00	0.20
quintile 3	0.19	7.42 **	4.14	0.35	16.16 **	4.35	0.20
quintile 4	0.12	5.28 **	2.64	0.22	9.42 **	2.43	0.20
quintile 5	-	-	1.00	-	-	1.00	0.20
age < 25	0.49	9.06 **	12.74	0.29	7.34 **	3.39	0.04
age 25-34	0.36	9.10 **	9.46	0.26	8.55 **	2.94	0.18
age 35-44	0.33	9.11 **	8.84	0.26	8.66 **	2.88	0.22
age 45-64	0.20	8.32 **	5.18	0.24	9.59 **	2.64	0.35
age 65+	-	-	1.00	-	-	1.00	0.20
couple only	-	-	1.00	-	-	1.00	0.27
couple with children	0.10	6.27 **	2.39	0.26	12.70 **	2.86	0.33
single	0.03	2.36 **	1.39	-0.06	-3.10 **	0.76	0.25
sole parent	0.25	7.24 **	4.77	0.38	13.13 **	5.07	0.07
group	0.04	1.31	1.41	0.18	4.15 **	2.08	0.03
other	0.11	3.67 **	2.40	0.22	6.43 **	2.40	0.05
outright owner	-	-	1.00	-	-	1.00	0.35
purchaser	0.09	5.50 **	2.22	0.18	8.09 **	2.06	0.35
private renter	0.17	7.98 **	3.65	0.27	11.59 **	2.98	0.22
public renter	0.28	7.43 **	5.38	0.33	10.08 **	3.97	0.05
other tenure	-0.03	-1.52	0.66	-0.04	-0.80	0.86	0.03
employed	-0.05	-3.89 **	0.60	-0.11	-4.23 **	0.64	0.66
capital city	-0.02	-2.13 **	0.84	-0.02	-1.13	0.93	0.63
NSW	-0.02	-0.97	0.80	-0.01	-0.16	0.97	0.33
Vic	0.00	0.10	1.02	0.06	1.22	1.26	0.25
Qld	-0.01	-0.45	0.90	0.02	0.37	1.07	0.20
SA	0.00	-0.06	0.98	0.04	0.71	1.16	0.08
WA	0.00	0.16	1.04	0.01	0.12	1.03	0.10
Tasmania	-	-	1.00	-	-	1.00	0.03

\*\* significant at <5% level

sample size	6,214	6,214
Chi square (25df)	1,239	1,425
Pseudo R square	0.22	0.17
Percent correctly estimated	85	71

Source: HES 2003-04, confidentialised unit record file

Results are presented only for a simple linear model. Models that included interaction terms for age, income, household and tenure and each of these with housing stress were experimented with but, whilst the fit of the equations improved marginally, the key results were unchanged from those presented.

As can be seen from the results presented in Table 3.9, the models fitted yield highly significant results and correctly predict whether or not households face financial stress for 85 per cent of the cases for high financial stress and 71 per cent of the cases for some financial stress. Every one of the age, income and tenure dummies is highly significant and of the expected sign. All marginal effects for income, for example, are positive. When all other variables are held constant, this implies that the probability of being in financial stress increases relative to that for households in quintile 5 as income falls from quintile 4 through to quintile 1. With other characteristics constant, a household in the lowest income quintile is almost ten times more likely to be in high level financial stress than a household in the highest income quintile and sixteen times more likely to be in some financial stress.

A similar result holds for the age dummies. As the age of the household in question decreases from age 65+, the probability that the household will be in financial stress increases compared with a household in the oldest age group, and more dramatically so for the probability of having a high level of financial stress compared with some financial stress. With all other characteristics the same, young households (aged less than 25 years) are almost 13 times more likely than older households (aged at least 65 years) to face a high level of financial stress but only 3 times more likely to experience some level of financial stress.

Compared with the base couple household, all other household types have a higher probability of being in financial stress, with the greatest margin being for sole parents when all other variables are held constant at their mean value. Households in public rental are 5 times more likely and households in private rental 4 times more likely to be in high financial stress than their counterparts in outright ownership. Households where the reference person is employed are less likely to be in financial stress. The result for the spatial variables suggest households living in a capital city are marginally less likely to be in high level financial stress than their country cousins, but the result is not robust across both financial stress measures.

As shown in Table 3.10, these results also hold when a continuous housing cost ratio variable is employed in place of the dichotomous housing stress variable reported in Table 3.9. The potential advantage of the continuous variable is that it does not impose an arbitrary definition on what constitutes housing stress — and it allows for the possibility that the housing cost ratio that determines whether or not different types of households with different levels of income are able to meet their non housing needs differs by household type and income level. However, the similarity of the results for both the dichotomous and continuous versions of the housing stress variable suggests that the way in which this is measured is irrelevant for the purpose to which it is put in this analysis.

**Table 3.10: Marginal effects and odds ratios of being in financial stress, 2003-04: continuous housing cost ratio variable**

	High level financial stress			Some financial stress			Mean of X
	Marginal effects	b/se	Log odds	Marginal effects	b/se	Log odds	
Constant	-0.54	-18.64 **		-0.81	-14.71 **		1.00
HC RATIO	0.00	0.18	1.00	0.00	0.48	1.00	15.14
quintile 1	0.34	7.78 **	8.91	0.58	27.12 **	15.75	0.19
quintile 2	0.26	7.96 **	5.86	0.47	21.23 **	7.83	0.20
quintile 3	0.19	7.25 **	4.06	0.35	15.76 **	4.30	0.20
quintile 4	0.12	5.24 **	2.62	0.22	9.32 **	2.42	0.20
quintile 5	-	-	1.00	-	-	1.00	0.20
age < 25	0.48	8.97 **	12.55	0.29	7.27 **	3.37	0.04
age 25-34	0.36	9.01 **	9.32	0.26	8.42 **	2.92	0.18
age 35-44	0.33	9.04 **	8.73	0.26	8.56 **	2.86	0.22
age 45-64	0.20	8.29 **	5.14	0.23	9.55 **	2.63	0.35
age 65+	-	-	1.00	-	-	1.00	0.20
couple only	-	-	1.00	-	-	1.00	0.27
couple with children	0.10	6.24 **	2.38	0.25	12.68 **	2.86	0.33
single	0.03	2.35 **	1.39	-0.06	-3.11 **	0.76	0.25
sole parent	0.25	7.25 **	4.77	0.38	13.13 **	5.07	0.07
group	0.04	1.29	1.40	0.18	4.16	2.08	0.03
other	0.12	3.68 **	2.40	0.22	6.45 **	2.41	0.05
outright owner			1.00			1.00	0.35
purchaser	0.08	4.58 **	2.10	0.17	6.69 **	1.99	0.35
private renter	0.16	6.94 **	3.48	0.26	10.02 **	2.88	0.22
public renter	0.28	7.17 **	5.35	0.32	9.57 **	3.89	0.05
other tenure	-0.03	-1.47	0.67	-0.03	-0.75	0.86	0.03
employed	-0.05	-3.86 **	0.60	-0.11	-4.22 **	0.64	0.66
capital city	-0.02	-2.22 **	0.83	-0.02	-1.20 **	0.93	0.63
NSW	-0.02	-1.04	0.79	-0.01	-0.20	0.96	0.33
Vic	0.00	0.06	1.01	0.06	1.20	1.26	0.25
Qld	-0.01	-0.50	0.89	0.02	0.34	1.07	0.20
SA	0.00	-0.07	0.98	0.04	0.70	1.16	0.08
WA	0.00	0.13	1.03	0.01	0.11	1.02	0.10
Tasmania	-	-	1.00	-	-	1.00	0.03
sample size			6,214			6,214	
Chi square (25df)			1,238			1,425	
Pseudo R squared			0.22			0.17	
Percent correctly estimated			85			70	

Source: HES 2003-04, confidentialised unit record file

For the purpose of this summary, it is the results for the housing stress variables (STRESS or HCRATIO) that are of interest. The key result from the results presented in the above two tables is counter-intuitive given the results presented earlier in the chapter. The results suggest that, when all of the common risk factors are controlled for simultaneously through use of multivariate analysis, the analysis fails to establish a statistical relationship between financial and housing stress. In other words, housing



stress does not appear to have an independent effect on financial stress. The coefficients of the dichotomous STRESS variable in Table 3.9 and those of the continuous HCRATIO variable in Table 3.10 are both extremely small and, more importantly, insignificant both in relation to explaining high level financial stress or any level of financial stress. In the estimates that apply to high level of financial stress, the coefficient of the dichotomous housing stress variable is of the wrong sign.

These results of small, insignificant (and, inconsequentially, often perverse) effects of housing stress on financial stress hold for all of the variations in specification described above that were estimated but are not reported. Together they suggest that the apparent correlations observed in the tables and charts presented in sections 3.1 to 3.4 arise because of the common factors that contribute simultaneously to housing stress and financial stress. The probability of being in financial stress is affected by the same risk factors that determine the likelihood that a household is in housing stress. This is supported by the results presented in the Appendix A on the determinant of housing stress.<sup>17</sup>

Some explanations for the failure of the analysis to identify the impact that housing stress (or a high housing cost ratio) has on financial stress are provided in section 3.6.3. The following two sub-sections report first on regressions undertaken to check the robustness of the estimates reported in Table 3.9 and 3.10. Results reported in similar studies are then examined. Alternative estimates that address these explanations are provided in the final section of this chapter.

### *3.6.1 Sensitivity analysis*

As a check on the robustness of the conclusion above, this sub-section reports briefly on additional analyses undertaken. As indicated above, specification tests which allowed for interactions between the key explanatory variables were considered alongside the simple linear relationships reported in the previous sub-section. These refinements to the specification had no impact on the key coefficients of interest.

In addition to these tests, the regressions were re-estimated by restricting the sample to those most likely to be in housing stress. The key restrictions imposed were, first, to limit the analysis to households in the lowest two income quintiles<sup>18</sup> and, second, to limit it to low income private renters. One benefit of these restrictions is that the confounding effect of higher income households who report being in financial stress is eliminated. One disadvantage is that they reduce the sample size from more than the 6,000 households used in the regressions reported above to just over 2,500 when the analysis was restricted to low income households, and to only 500 when the analysis was restricted to private renters in the lowest two income quintiles.<sup>19</sup>

At an aggregate level, all regressions (for both the first and second restrictions) performed less well. They correctly predicted a lower proportion of cases (as low as 67 per cent in the latter case compared with 85 per cent when no restrictions were employed) and had lower pseudo R-squared values.

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<sup>17</sup> For purposes of comparison, the analyses for the probability of being in housing stress provided in Appendix A are equivalent to those presented here for financial stress in that they have the same underlying model specification. The housing stress results in Appendix A suggest that, of all the potential factors considered, income and tenure are the dominant factors that expose a household to the risk of housing stress.

<sup>18</sup> Based on the distribution of equivalent disposable household income.

<sup>19</sup> A restriction to households in the lowest 40 per cent of the income distribution does not necessarily reduce the sample size to 40 per cent of the total because of over-sampling of households who are under-represented in the overall population.

In all cases, the estimated coefficients of the dichotomous stress variable or the continuous housing cost ratio variable remained insignificant. The first restriction (that is, limiting the analysis to those in the lowest two income quintiles) did have the effect of reversing the perverse negative sign on the two housing stress variables. In other words, regardless of whether a dichotomous stress variable or a continuous housing cost ratio was employed as an explanatory variable, increased the probability of being in any level or financial stress or, more restrictively, high level financial stress. However, as the estimates remained insignificant, their magnitudes are not reported.

The second restriction, which further constrained analysis to private renters in the lowest two income quintiles, rather than reversing a perverse negative coefficient on the dichotomous housing stress variable, retained this and introduced a perverse negative coefficient on the continuous housing cost ratio variable. These estimates, however, had even lower confidence levels associated with them than those for the first restriction.

In other words, both sets of restrictions had no impact on the conclusion already drawn and summarised in the following, concluding chapter. The multivariate analysis failed to establish a statistical relationship between housing and financial stress. The probability of being in financial stress is affected by the same risk factors that determine the likelihood that a household is in housing stress but it is not possible to identify the extent to which it is exacerbated by whether or not a household experiences housing stress within the constraints of the regressions estimated.

### *3.6.2 Comparison with other studies*

The studies by Bray (2001) and La Cava and Simon (2005) referred to in Chapter 1 both undertook a multivariate analysis of factors influencing financial stress, although their specifications and definitions of financial stress were marginally different from those employed in this study. The relevance of any differences in the definitions of financial stress (discussed in Chapter 1) is minimised by the use in this study of both a broader and a narrower measure of financial stress than was employed in Bray and La Cava. Specification differences arise because the focus of these two studies was different, with the impact of housing costs on financial stress incidental rather than critical to their analysis. However, both did include a variable that might be regarded as a proxy for a housing cost or housing stress variable in their specifications.

Although Bray's descriptive presentations of results were based on the aggregate financial stress indicators he derived (and used in this chapter), the results of his multivariate analysis are presented only for the 6 individual disaggregated indicators derived for the two levels of stress in each of the 3 categories which formed the basis of his "missing out", "cashflow" and "hardship" taxonomy. In his words, there is some variation in the assessment of fit in his equations. However, with only one or two exceptions, all variables included in his specification were significant at the 5 per cent level.

Bray's specification of tenure distinguished private renters paying more than 30 per cent of their income from those paying less than 30 per cent but did not do the same for purchasers. This variable, therefore, is a subset of the dichotomous stress variable in the results presented above. Bray's study also incorporated more detail in relation to source of income, and to employment, education and disability status than in the results reported above and included a broader range of household (or family) types. It also included five additional variables that measured the proportion of total household expenditure spent on repayments of credit card and HECS and on gambling, alcohol and tobacco products. His estimating equations, however, did not include any age variable. This means that outcomes for young households were

combined with those for older households. Contrary to the results reported in this paper, the odds ratios for both the private rent variables were positive, indicating that households living in private rental had a higher probability of being in stress than their counterparts in other tenures. However, for all but the equation based on multiple incidences of hardship, the odds ratios for private renters paying at least 30 per cent of their income in meeting their housing costs were only marginally greater than for households paying less than 30 per cent. For the multiple hardship case it was 50 per cent higher, which suggests there might be an independent significant impact on at least this measure of financial stress for private renters with high housing costs. The results presented, however, do not allow testing of this possibility.

La Cava and Simon's results, based on the 2001 HILDA survey, provide a similar analysis for purposes of comparison.<sup>20</sup> Their measure of financial stress did not include the deprivation indicators that were embodied in the aggregate financial stress indicator developed by Bray and employed here. However, their definition based on this narrower band of indicators is aligned closely to the definition of some financial stress employed in the results presented above.

La Cava and Simon's specification covered most of the variables included in the regressions reported in Table 3.9 and Table 3.10, and supplemented these with additional variables on gender, marital status and family size, none of which had significant coefficients. Those authors also included a number of economic and what they described as "interest sensitive" variables, such as dwelling value, number of and interest on credit cards and, of relevance for this study, mortgage repayments expressed as a proportion of household disposable income. They did not, however, separate out home purchasers from those who own their homes outright, with the result that outcomes for the former are combined with those for the latter. In the same manner as was employed for the results presented in this study, they removed from their analysis both the relatively small number of households who reported mortgage repayments in excess of 100 per cent of disposable income, and those who reported repayments less than zero.<sup>21</sup> Their reported equations had similar goodness of fit outcomes to those reported in Table 3.9 and Table 3.10 and most of the key variables had coefficients that were significant at the 1 per cent level.

The variable that might act as a proxy for housing costs in La Cava and Simon's study is the ratio of mortgage repayments to income. As with the Bray study, this variable, therefore, can be seen as a subset of the housing cost ratio variable employed in this paper. It applies only to purchasers and does not include other operating expenses. In La Cava and Simon's results, this variable has a positive impact on the probability that a household is in financial stress but, as they report, the magnitude of the effect is not large. On average, mortgage repayments absorb just 7.5 per cent of household disposable income in the HILDA survey and the La Cava and Simon results suggest that a 1 per cent rise in mortgage debt would increase the probability that a household was in financial stress by 0.2 per cent. The mild effect of this variable is seen as unsurprising because "cash constrained households include a higher proportion of pension recipients such as the unemployed, the disabled and the elderly" (La Cava and Simon, p50).

One final analysis that can be reported on is one that was undertaken for this project prior to the data from the 2003-04 HES becoming available. This used data from the

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<sup>20</sup> They also undertook an equivalent analysis for the 1998-99 HES but did not report the results since they mirrored those from HILDA.

<sup>21</sup> This study removed cases where housing costs exceeded 80 per cent of gross household income. There were no cases where reported housing costs were negative.

earlier 2002-03 General Social Survey (GSS) (ABS 2003). One advantage of the GSS is that the sample size was more than double that in the HES. The GSS collected information on the same financial stress indicators as reported in the HES but did not collect information on the deprivation variables. A household was defined as having a low level of financial stress on a composite variable if it reported an occurrence of any one of the indicators recorded, and as a high level of stress if at least two were reported. These definitions are virtually identical to those employed in this study<sup>22</sup>, and the low level financial stress variable is directly comparable with the measure employed by La Cava and Simon. Results from the GSS data indicate that 80 per cent of households reported no problems of financial stress<sup>23</sup> and 20 per cent reported at least one occurrence, with just over half of these (11 per cent) experiencing what is defined as high level financial stress.

The multivariate analysis undertaken with the financial stress variables as defined in the GSS study replicated exactly that reported above for the 2003-04 HES and yielded almost identical results. The coefficients on the dichotomous stress variables were insignificant and perverse (that is, negative). The coefficients on the continuous housing cost ratio variables were generally of the right sign but only significant at more than a 10 per cent level. In both cases, the marginal effects were small in relation to the various socio-demographic and economic variables. The replication of the results with a different data set provides one response to the potential criticism of the pre-test bias test that can arise from studies such as this where results are reported after some considerable exploration with alternative specifications and explanatory variables.

The purpose of the discussion in this section has been to provide a cross-check for the results obtained in this paper with those obtained in similar studies. The results from the Bray and La Cava and Simon studies, which apply to a subset of the data used in this study, yield results which, although they do not indicate a strong relationship between housing stress and financial stress, do provide results more in line with the intuition that emerges from the simpler results presented at the start of this chapter: viz, that being in housing stress increases the probability of being in financial stress. The results from the almost identical analysis undertaken on the larger 2002-03 GSS sample support the conclusions drawn from the 2003-04 HES analysis provided in this paper. All suggest that it is difficult to statistically identify a strong relationship between housing stress and financial stress within the constraints of the measures and techniques employed.

### *3.6.3 Explanations for failure to identify impact of housing stress on financial stress*

As with all econometric analyses, the possibility that the results are affected by misspecification of the underlying equation from which they are derived always has the potential to provide an explanation for unexpected results. In this case, there are a number of reasons why it has not been possible to provide an estimate of the extent to which alleviating housing stress will alleviate financial stress.

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<sup>22</sup> One small difference arises from exclusion of the small number of households who report multiple occurrences of one or more of the deprivation indicators but occurrences of the financial stress indicators in HES.

<sup>23</sup> This is similar to the 21 per cent reported by La Cava and Simon for the 1998-99 HES or the 22 per cent that can be derived from the 1998-99 HES results presented in Bray (2001, Table 4 p25) by adding to the proportions of those with no financial stress those who only experienced a problem categorized as being in the 'missing out' or deprivation group of indicators.

The first is signalled by the differences in the results obtained by the Bray and La Cava and Simon studies and those obtained in this study. It lies in the particular definition of financial stress employed. This explanation is consistent with a suggestion made by Butterworth and Crosier (2005) who, whilst they supported a summary measure based on a simple count approach of multiple indicators as employed in this study, suggest that there might be value in distinguishing the different types of financial stress experienced. In this study, only two summary measures of financial stress were employed and each differed in some way from those employed by Bray and La Cava and Simon.

A related explanation is that use of the ratio method based on housing cost of at least 30 per cent of income is too crude a measure to identify the impact that high housing costs have on financial stress, even when the broad factors that influence non-housing needs (such as type of household) are controlled for. Use of equalised income quintiles as an attempt to include additional controls such as number of children may have been an inadequate proxy for the extent to which non-housing needs may contribute to financial stress.

A third explanation arises from the very clear result that housing stress and financial stress (as measured in this study) have common causal factors. The possibility of multicollinearity between housing stress and the other explanatory variables is, therefore, real. If this is so, estimation problems arise because the probability of being in financial stress is affected by the same risk factors that determine housing stress. That this is so is supported by the results presented in the Appendix A on the determinants of housing stress.<sup>24</sup> However, a simple test to check whether this contributed to the perverse result, however, did not lend support to this argument.<sup>25</sup>

### **3.7 Impact of housing stress on financial stress**

However, the possibility of multicollinearity between the key risk factors considered (income, age, household type and tenure) is also very real. Any potential problems are compounded by discontinuities in the data associated with use of dummy variables and the interaction with sample size. Once the key risk factors are controlled for, there may be inadequate variation in the data to identify the key relationship of interest. Although the HES sample, at around 6,000 observations, is relatively large, attempting to control for 5 income variables, 5 age variables, 5 tenure variables, 6 household type variables, 6 state variables and a capital city and an employment variable in addition to the housing stress variable imposes too many restrictions on the data

Table 3.11 presents results from a simple solution to these problems by reducing the number of explanatory variables considered. It replicates the graphical analysis presented at the start of the chapter by examining the impact of housing stress on financial stress by controlling for each of the key risk factors one at a time. The results therefore provide an indication of the impact of housing stress on financial stress when the impact of each of these key risk factors is removed. The regressions

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<sup>24</sup> For purposes of comparison, the analyses for the probability of being in housing stress provided in Appendix A are equivalent to those presented here for financial stress in that they have the same underlying model specification. The housing stress results in Appendix A suggest that, of all the potential factors considered, income and tenure are the dominant factors that expose a household to the risk of housing stress.

<sup>25</sup> These tests involved re-estimating the equations reported in Table 3.9 and 3.10 without the housing stress or housing cost ratio variables. If the correlation between these housing variables and the remaining explanatory variables is problematic, the estimates of the coefficient and their standard errors will be unstable. This was not the case for the particular tests undertaken.

and the reporting of the results follow the same basic structure as the regressions discussed in the previous section.

As can be seen from the summary statistics for each set of results, the explanatory power of these simple regressions is poor. This highlights the existence of many factors that contribute to financial stress other than those considered in the respective regressions reported. However, the results do yield highly significant estimates of the impact of each of the key risk factors considered and, independently, of housing stress on the probability that a household will be in financial stress.<sup>26</sup> Each of these is of the expected sign and order of magnitude.

These results are consistent with the a priori expectation that housing stress has an impact on financial stress, over and above that which arises because of the common causal risk factors that explain both housing and financial stress. However, because of the problems that arise in attempting to identify this effect when controlling for all key risk factors, they should be treated with some caution.

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<sup>26</sup> This conclusion is robust when the same variations in specification regarding definitions of independent variables are employed as for the more complex regressions covered above.

**Table 3.11: Marginal effects and odds ratios of being in financial stress by housing stress and common risk factors, 2003-04**

Variable	High level financial stress			Some financial stress			Mean of X
	Marginal effects	b/se	Log odds	Marginal effects	b/se	Log odds	
<b>Income</b>							
STRESS	0.10	14.92	1.91	0.14	7.53 **	1.79	0.14
quintile 1	0.25	7.66 **	4.42	0.35	17.30 **	4.23	0.19
quintile 2	0.28	9.22 **	5.01	0.32	15.98 **	3.80	0.20
quintile 3	0.25	8.01 **	4.39	0.29	13.89 **	3.28	0.20
quintile 4	0.17	5.72 **	2.90	0.20	9.17 **	2.28	0.20
quintile 5	-	-	1.00	-	-	1.00	0.20
Sample size		6,214			6,214		
Chi square (5df)		277			454		
Pseudo R squared		0.05			0.05		
Percent correctly estimated		83			61		
<b>Age</b>							
STRESS	0.09	6.06 **	1.84	0.17	9.08 **	1.98	0.14
age < 25	0.51	12.25 **	11.70	0.26	8.03 **	2.86	0.04
age 25-34	0.34	10.76 **	6.85	0.16	7.33 **	1.88	0.18
age 35-44	0.33	11.14 **	6.84	0.18	8.98 **	2.08	0.22
age 45-64	0.17	7.29 **	3.28	0.10	5.38 **	1.50	0.35
age 65+	-	-	1.00	-	-	1.00	0.20
Sample size		6,214			6,214		
Chi square (5df)		418			223		
Pseudo R squared		0.09			0.03		
Percent correctly estimated		83			61		
<b>Household type</b>							
STRESS	0.10	6.66 **	0.07	0.18	9.30 **	0.38	0.14
couple only							0.27
couple with children	0.13	7.78 **	2.00	0.16	9.59 **	2.04	0.33
single	0.13	6.92 **	2.52	0.11	5.66 **	1.94	0.25
sole parent	0.56	20.13 **	2.45	0.47	26.68 **	1.53	0.07
group	0.19	4.15 **	14.86	0.22	5.83 **	9.73	0.03
other	0.21	5.56 **	2.99	0.20	6.56 **	2.42	0.05
Sample size		6,214			6,214		
Chi square (6df)		509			487		
Pseudo R squared		0.09			0.06		
Percent correctly estimated		84			64		
<b>Tenure</b>							
STRESS	0.06	4.32 **	1.54	0.14	6.88 **	1.73	0.14
outright owner							0.35
purchaser	0.12	7.69 **	2.41	0.08	5.24 **	1.41	0.35
private renter	0.30	14.57 **	5.94	0.24	13.76 **	2.67	0.22
public renter	0.53	17.33 **	13.24	0.44	21.32 **	7.93	0.05
other tenure	0.05	1.13	1.45	0.05	1.07	1.21	0.03
Sample size		6,214			6,214		
Chi square (5df)		578			472		
Pseudo R squared		0.10			0.06		
Percent correctly estimated		83			64		

\*\* significant at <5% level

Source: HES 2003-04, confidentialised unit record file

Despite the estimation problems identified in the previous section, the results presented here are credible and consistent. Whether income, age, household type or tenure is controlled for, the probability that a household experiencing housing stress will also experience high level financial stress is increased by up to 10 percentage points (from .06 or 6 percentage points when tenure is controlled and from .10 or 10 percentage points when income is controlled). The probability that they will experience some financial stress is increased from 14 to 18 percentage points depending on which risk factor is controlled for.



## 4 CONCLUSIONS

This paper has analysed the factors that contribute to financial stress as defined by the financial stress and deprivation indicators recorded in the 2003-04 Household Expenditure Survey. Households were defined as being in some financial stress if they reported just one occurrence of any of the indicators available such as not being able to pay bills on time because of a shortage of money or going without meals. This resulted in 42 per cent of households being defined as experiencing some financial stress. Households were defined as being in high financial stress if they reported multiple occurrences of the indicators collected in the HES<sup>27</sup>. This resulted in 17 per cent of households being defined as experiencing high financial stress.

The incidence of financial stress was shown to decrease markedly as household income increased and to decrease somewhat less markedly as the age of the household increased. By household type, the incidence of financial stress was remarkably similar, while that of high financial stress was well above average for sole parents (and only for sole parents). By tenure, it was well above average for renters and, particularly, for renters in public housing.

In the main, the factors that increased the risk of being in financial stress were shown to be the same factors that increased the risk of being in housing stress. In other words, the results suggest the possibility that the correlation between housing and financial stress for lower income households can be attributed to their common risk factors. Low income, youth, having only a single adult in the household, and renting all contribute both to financial stress and to housing stress. This result highlights the extent to which at least two of the sources of disadvantage faced by many low income households (viz. housing stress and financial stress) can be attributed to the socio-economic and demographic characteristics of those households. It suggests, therefore, that policy responses, including housing policy responses, need to recognise the diversity of the factors that contribute to both housing and financial stress.

The key question addressed by the analysis in this paper, however, was whether high housing costs had an independent effect in contributing to financial stress. Almost without exception, when income, age, household type and tenure were individually controlled for, the incidence of financial stress was higher for households who had high housing cost ratios than it was for households whose housing cost ratios were less than 30 per cent of income. In particular, the incidence of financial stress and high financial stress was shown to be significantly higher for lower income households who were also experiencing housing stress.

When all of the common risk factors were controlled for simultaneously through use of multivariate analysis, the formal analysis failed to establish a statistical relationship between financial and housing stress. However, when each of these factors was controlled for individually, the formal analysis suggests that if a household is experiencing housing stress, there is approximately a ten percentage point increase in the probability that they will also experience high level financial stress over and above the impact of each of the key risk factors. The increase in the probability that they will experience some financial stress is even greater.

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<sup>27</sup> Households with multiple occurrences of deprivation indicators only (such as not being able to afford a week's holiday away from home or a night out once a fortnight) but with no associated cashflow or hardship problems were not defined as being in high financial stress.

Finally, whilst the results do suggest that reducing the incidence of housing stress will reduce the incidence of financial stress, they also suggest that financial stress would not be eliminated by lowering housing costs alone. Financial stress is determined by additional factors, many of which also determine housing stress. As such, the results caution against the simplistic conclusion that improving housing affordability outcomes will fully address this particular manifestation of one of the multiple sources of deprivation many lower income households face.

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## APPENDIX A: SUPPLEMENTARY RESULTS

### A.1: Financial stress definitions

Table A. 1 provides a comparison of the financial stress classifications employed in Table 1.4 in the text with Bray's classification (2001, p25). As in the text, the cases have been ranked according to the numbers of households reporting the various combinations reported. Unless otherwise indicated, experience of any of the reported combinations results in the household being defined as having some level of financial stress. Only households experiencing combinations indicated by "x" are defined as experiencing high level financial stress.

**Table A.4.1: Comparison of financial stress classifications**

			Total 2003-04		Total 1998-99	
			(%)	('000s)	(%)	('000s)
-	-	-	58.0	4,489		
multiple missing out	-	-	10.9	842	15.7	1,115 x
some missing out	-	-	10.1	784	21.6	1,538
-	some cashflow	-	3.6	275	4.1	293
multiple missing out	some cashflow	-	3.0	229 x		o
multiple missing out	multiple cashflow	-	2.3	178 x	3.7	263 x
some missing out	some cashflow	-	2.0	157 x	9.8	699
multiple missing out	multiple cashflow	some hardship	1.6	126 x		o
multiple missing out	multiple cashflow	multiple hardship	1.6	120 x	1.6	116 x
-	multiple cashflow	-	1.3	98 x	3.4	242 x
some missing out	multiple cashflow	-	1.0	75 x		o
multiple missing out	some cashflow	some hardship	0.8	65 x		o
multiple missing out	-	some hardship	0.8	59 x		o
multiple missing out	some cashflow	multiple hardship	0.5	37 x		o
-	multiple cashflow	some hardship	0.5	37 x		o
-	some cashflow	some hardship	0.4	30 x	0.9	67
-	-	some hardship	0.3	26	0.3	21
some missing out	multiple cashflow	some hardship	0.3	23 x		o
some missing out	some cashflow	some hardship	0.3	20 x	5.7	409
-	multiple cashflow	multiple hardship	0.2	16 x	0.5	37 x
some missing out	-	some hardship	0.2	16 x	1.2	86
some missing out	multiple cashflow	multiple hardship	0.2	13 x		o
multiple missing out	-	multiple hardship	0.1	8 x	0.8	59 x
some missing out	some cashflow	multiple hardship	0.1	5 x		o
-	-	multiple hardship	0.1	5 x	0.2	12 x
-	some cashflow	multiple hardship	0.0	1 x		o
some missing out	-	multiple hardship	0.0	1 x		o
no. households ('000s)			7,736		7,122	

x included in high financial stress measure

o omitted from both low and high measures

Source: HES 2003-04, confidentialised unit record file

## A.2: Effect of alternative ways of defining income quintiles

The results in the first set of columns of Table A. 2 replicate those presented in Table 3.9 in the text in order to facilitate a comparison of the effect of using gross rather than equivalent disposable income quintiles. As can be seen, the results do not differ substantively.

**Table A.4.2: Marginal effects and odds ratios of being in financial stress, 2003-04 based on equivalised disposable income quintiles**

	gross income quintiles			equiv disp income quintiles			Mean of X
	Marginal effects	b/se	Log odds	Marginal effects	b/se	Log odds	
Constant	-0.54	-18.87 **		-0.53	-19.63		1.00
STRESS	-0.01	-0.99	0.90	0.01	-1.58	0.00	0.14
quintile 1	0.36	8.41 **	9.58	0.36	9.13 **	0.85	0.19
quintile 2	0.26	8.32 **	6.12	0.31	9.60 **	10.05	0.20
quintile 3	0.19	7.42 **	4.14	0.23	7.90 **	8.29	0.20
quintile 4	0.12	5.28 **	2.64	0.10	4.17 **	5.24	0.20
quintile 5	-	-	1.00	-	-	1.00	0.20
age < 25	0.49	9.06 **	12.74	0.48	8.96 **	2.32	0.04
age 25-34	0.36	9.10 **	9.46	0.38	9.54 **	13.09	0.18
age 35-44	0.33	9.11 **	8.84	0.33	9.13 **	10.79	0.22
age 45-64	0.20	8.32 **	5.18	0.20	8.39 **	9.22	0.35
age 65+	-	-	1.00	-	-	1.00	0.20
couple only	-	-	1.00	-	-	1.00	0.27
couple with children	0.10	6.27 **	2.39	0.03	2.49 **	1.02	0.33
single	0.03	2.36 **	1.39	0.06	4.14 **	1.40	0.25
sole parent	0.25	7.24 **	4.77	0.20	6.33 **	1.81	0.07
group	0.04	1.31	1.41	0.02	0.89	4.05	0.03
other	0.11	3.67 **	2.40	0.07	2.73 **	1.25	0.05
outright owner	-	-	1.00	-	-	1.00	0.35
purchaser	0.09	5.50 **	2.22	0.09	5.74 **	1.87	0.35
private renter	0.17	7.98 **	3.65	0.17	8.08 **	2.32	0.22
public renter	0.28	7.43 **	5.38	0.26	7.12 **	3.79	0.05
other tenure	-0.03	-1.52	0.66	0.03	-1.41	5.15	0.03
employed	-0.05	-3.89 **	0.60	0.04	-2.76 **	0.68	0.66
capital city	-0.02	-2.13 **	0.84	0.02	-1.97	5.37	0.63
NSW	-0.02	-0.97	0.80	0.02	-0.99	0.85	0.33
Vic	0.00	0.10	1.02	0.00	-0.03	0.80	0.25
Qld	-0.01	-0.45	0.90	0.01	-0.53	1.01	0.20
SA	0.00	-0.06	0.98	0.01	-0.31	0.88	0.08
WA	0.00	0.16	1.04	0.00	0.08	1.08	0.10
Tasmania	-	-	1.00	-	-	1.00	0.03
sample size			6,214			6,214	
Chi square (25df)			1,239			1,324	
Pseudo R squared			0.22			0.23	
Percent correctly estimated			85			85	

Source: HES 2003-04, confidentialised unit record file

### **A.3: Probability of being in housing stress**

The results in Table A. 3 below are based on a logit model with the probability of having a housing cost ratio of 30 per cent or more of gross household income modelled as the dependent variable. They mirror those for financial stress presented in Table 3.9 and Table 3.10 in the text. Results are presented for two models, one each for income quintiles based on gross and equivalent disposable income. The former is preferred on a priori grounds when household type is explicitly taken into account as it avoids any problems of interpretation arising because of the inter-relationships between household type and equivalence scales.

The results suggest that, of those reported, the greatest single risk factors that determine whether or not a household is in housing stress are income and tenure. The income and tenure dummies (for both sets of results) are highly significant and of the expected sign. All marginal effects for income, for example, are positive and the marginal effects are greater for low income and purchasing or renting than for any of the age, household type or location variables. When all other variables are held constant, this implies that the probability of having a housing cost ratio of at least 30 per cent of income increases dramatically relative to that for households in quintile 5 (the highest) as income falls from quintile 4 through to quintile 1 (the lowest).

When age, household type, tenure, employment status and location are held constant, a household in the lowest income quintile is almost one hundred times more likely to have a housing cost ratio of at least 30 per cent of income than a household in the highest income quintile. An even more extreme result holds for the tenure dummies with the results signalling the significant impact that being a purchaser or private renter has on the probability of being in housing stress.

Young households (aged less than 25 and between 25 and 34 years old) have a significantly greater probability of being in housing stress than older households with the same income, household and housing characteristics. The results for the spatial variables show that capital city dwellers are twice as likely to be in housing stress as their non-metropolitan counter-parts and reinforce the significance of high housing costs in the more populous states.

Once age, tenure and income are controlled for, household type has a relatively small and often insignificant independent effect on the probability of being in housing stress.

**Table A.3: Marginal effects and odds ratios of being in housing stress, 2003-04**

Variable	gross income quintiles			equiv disp income quintiles			Mean of X
	Marginal effects	b/se	Log odds	Marginal effects	b/se	Log odds	
Constant	-0.36	-14.18		-0.34	-14.20		
quintile 1	0.60	13.45 **	95.60	0.43	10.75 **	40.38	0.19
quintile 2	0.21	7.69 **	12.59	0.16	7.23 **	8.24	0.20
quintile 3	0.08	5.64 **	3.84	0.06	5.13 **	3.13	0.20
quintile 4	0.03	2.95 **	1.76	0.03	3.20 **	1.82	0.20
quintile 5	-	-	1.00	-	-	1.00	0.20
age < 25	0.04	2.27 **	2.27	0.03	2.00 **	1.94	0.04
age 25-34	0.04	3.15 **	2.39	0.03	2.51 **	1.89	0.18
age 35-44	0.03	2.63 **	1.97	0.02	1.64	1.46	0.22
age 45-64	0.01	1.25	1.29	0.00	0.38	1.08	0.35
age 65+	-	-	1.00	-	-	1.00	0.20
couple only	-	-	1.00	-	-	1.00	0.27
couple with children	0.00	0.48	1.07	-0.02	-4.93 **	0.51	0.33
single	0.00	0.17	1.02	0.04	4.74 **	2.17	0.25
sole parent	-0.01	-1.66	0.75	-0.01	-1.14	0.82	0.07
group	-0.01	-0.66	0.84	-0.01	-1.57	0.69	0.03
other	-0.02	-2.44 **	0.59	-0.02	-4.35	0.43	0.05
outright owner	-	-	1.00	-	-	1.00	0.35
purchaser	0.56	19.78 **	198.63	0.54	19.18 **	172.61	0.35
private renter	0.55	15.51 **	86.39	0.54	15.42 **	81.56	0.22
public renter	0.14	3.86 **	5.69	0.13	3.70 **	5.11	0.05
other tenure	-0.02	-0.98	0.50	-0.02	-0.87	0.53	0.03
employed	-0.01	-1.88	0.74	-0.01	-1.57	10.00	0.66
capital city	0.02	6.14 **	1.87	0.02	5.74 **	1.77	0.63
NSW	0.08	3.23 **	4.47	0.07	3.15 **	4.07	0.33
Vic	0.04	2.13 **	2.55	0.04	2.03 **	2.35	0.25
Qld	0.05	2.18 **	2.72	0.05	2.18 **	2.66	0.20
SA	0.02	0.94	1.50	0.02	0.91	1.47	0.08
WA	0.04	1.63	2.16	0.04	1.55	2.02	0.10
Tasmania	-	-	1.00	-	-	1.00	0.03

\*\* significant at <5% level

sample size	6,214	6,214
Chi square (24df)	1,617	1,564
Pseudo R square	0.33	0.31
Percent correctly estimated	89	89

Source: HES 2003-04, confidentialised unit record file



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