

Working Paper Series

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Working Paper No. 16/23
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Abstract

This paper considers an important facet of emerging household risk. Using Australian panel data, the analysis focuses on liquidity-constrained households and the potential for households to reduce insurance coverage as a way to correct their balance sheets after a shock. The results show not only that underinsurance occurs across the income distribution but also that the greatest reductions occur amongst the most liquidity-constrained households. Moreover, the results suggest a substitution effect by which stressed households reduce coverage in order to maintain spending on the contractual commitments that characterise the large and illiquid balance sheets of liquidity-constrained households. As well as demonstrating an important dynamic of risk accumulation arising from financial stress, the results make a key contribution to the insurance literature in revealing a significant new driver of underinsurance. More broadly, by presenting a vivid dynamic of household shock absorption through the accumulation of new risk, the analysis contributes to debates about how risks are shared between households and markets as household balance sheets expand.

JEL classification: D14, G52

Keywords: financial stress, insurance, liquidity-constrained households, financialization

Introduction

Research across the social sciences documents how economic insecurity has risen up the income ladder (Ranci et al., 2021; Nau and Soener, 2019). Amidst the emergence of new risks related to work, families, old age and housing (Adkins et al., 2021; Ebbinghaus, 2021), the risk of falling into spiralling financial losses as a result of life events such as illness, involuntary job loss and family breakdown has become more common (OECD, 2019). On the income side, wage premiums on higher education have declined (Bartsher et al., 2019; Birch and Preston, 2021), non-standard employment expanded (Hipp et al., 2015; Laß and Wooden, 2021) and wages stagnated (Bell and Blanchflower, 2018; Kalb and Meeke, 2021). At the same time, housing costs have soared (Ryan-Collins, 2019) and social protection declined (Hacker, 2006). These changes are imprinted on household balance sheets as growing housing and defined-contribution pension assets, on the one hand, and rising mortgage debt, on the other (Dynam, 2009), alongside higher insurance costs and proliferating locked-in contractual commitments – from childcare to broadband contracts to an array of consumer debt instruments – leaving households with smaller buffers with which to respond to shocks (Kaplan et al., 2014). Concepts like new social risks (Taylor-Gooby, 2004), asset-based welfare (Doling and Ronald, 2010) and financialisation (van der Zwan, 2014); risk shifting (Hacker, 2006), ‘the squeezed middle class’ (2019) and the household as the ‘shock absorber of last resort’ (IMF, 2005) capture these changes.

At the household level, economic sociologists identify an expanding ‘finance culture’ (Fligstein and Goldstein, 2015; Langley, 2009; Martin, 2002) as well as widespread attitudes of reluctance and contestation (Agunsoye, 2021; Weiss, 2015; Kuhner and Chou, 2019) and a slew of negative health outcomes associated with higher susceptibility to financial stress (Frasquilho et al, 2015; Guan et al., 2022; Kuo et al., 2021; Conklin et al., 2013). Economists in turn explore how bigger and more precarious balance sheets affect consumption and savings behaviour (Cooper and Dynam, 2016), identifying new risks and opportunities for the broader economy as households adapt to large and illiquid asset and liability positions (Mian and Sufi, 2017; Kaplan et al., 2014; Cho, 2019). These changes reflect the emerging dominance of the household as a financial actor – a leveraged investor – which displaces the traditional role of households as consumers and workers (Bryan and Rafferty, 2018) in parallel to broader structural change in the global economy driven by the expansion of finance (Jorda et al., 2020; Borio, 2014).

But there are key issues around the economic behaviour of households in conditions of financial precarity that have attracted surprisingly little attention in the multi-disciplinary research effort to understand new dynamics of household risk. Specifically, we know little about household’s interaction with home insurance during episodes of financial stress. This is a key issue in new dynamics of household risk both because the family home tends to be the biggest asset on the household balance sheet and is thus central to households’ economic security; as well as because insurance premiums are rising sharply alongside rising climate risk, creating a new set of cost pressures. What happens to households’ capacity to secure the home in the juggle of more and bigger balance sheet items is central to understanding the capacity of households to bear the higher burden of risk that is documented across the literature.

This paper examines if households maintain their insurance despite the higher susceptibility to financial stress that accompanies bigger household balance sheets. The paper explores this

potentially significant accumulation of risk by asking if households cut their home and vehicle insurance coverage as a way to rebalance their balance sheet after a shock. To do this, we track insurance expenditure following the experience of financial stress using Australia's national panel survey, the Household, Income and Labour Dynamics in Australia or HILDA Survey. HILDA data allows the analysis to stratify the sample not only by income but also by the ratio of contractual spending in relation to income in each household. By providing a percentage of household income that is tied up in relatively illiquid spending commitments like housing, childcare costs and health insurance, contractual commitments offer an indicator of liquidity constraint amongst households.

Using this liquidity constraint indicator, we find that while a significant portion of households who experience financial stress reduce their insurance coverage, the largest reductions in coverage occur amongst households who have the lowest proportion of income left over after meeting their contractual commitments. These liquidity constrained households that cut their insurance in the wake of financial stress are, moreover, spread across the income distribution. The availability of detailed data on household assets in HILDA allows us to control for the value of insurable assets, for which the results remain valid.

These results offer important insights into the implications of financial stress and the nature of underinsurance. The results show that underinsurance is a problem for middle-income and relatively wealthy households, as well as the low-income households familiar to the economics literature (Kunreuther and Michel-Kerjan, 2009: 122; Hudson et al., 2016; Tesselaar et al. 2020; Savitt, 2017). The results also show how financial stress can prompt a precipitous rise in risk exposure as households withdraw the insurance that secures their most important asset in order to shore up cashflow. This shows that common risks related to financial stress are significantly higher than might previously have been assumed.

Yet by probing the relationship between tight balance sheets and underinsurance, the results also provide insight into the way that risk is being shared between markets and households. Specifically, the greater likelihood of liquidity constrained households to reduce their insurance expenditure in the wake of financial stress suggests that liquidity constrained households may be absorbing shocks by cutting insurance coverage to free up cashflow for contractual commitments – that is, taking on the risks associated with underinsurance in order to stay 'on payment' for contractual commitments. This suggests a shock absorption function on the part of households that, by exposing the biggest asset that households have, brings with it much higher levels of risk.

To assess this possibility, the analysis tracks the evolution of contractual spending amongst liquidity constrained households. This shows that those liquidity constrained households that cut their insurance following the experience of financial stress do in fact maintain their spending on contractual commitments. This suggests that households are indeed cutting their insurance in order to maintain their contractual commitments in accordance with the illiquidity inherent in contractual commitments: when faced with an income shock, a household can choose not to pay the next monthly installment on home or car insurance but it might be much more difficult to withdraw from contractual commitments on consumer debt, locked-in broadband and phone contracts or childcare, let alone rent or mortgage (Chetty and Szedl, 2007).

The findings thus contribute to debates about how risks are shared between households and markets as household engagement with finance expands. The household here is observed absorbing shocks on its own balance sheet by taking on new risks of underinsurance rather than passing that shock on to markets – by hedging or insuring risk or simply defaulting on payments. The analysis thus contributes to debates about the standing of the household as ‘shock absorber of last resort’ (IMF, 2005). Our results suggest, as those such as Bryan and Rafferty (2018) have argued, that the household is poorly positioned to take on the new risks that are documented across the literature.

The paper proceeds as follows. The first section sketches a brief context of tight balance sheets and rising insurance premiums in Australia. The second section introduces the data and the third describes the analysis and the results. The fourth section discusses the results in the context of broader changes in financial markets and the relationship between households and markets before concluding.

The Australian context

Typical of the Anglo economies, Australia’s housing market plays a central role in the wider economy (Seabrooke and Schwartz, 2007; Ryan-Collins and Murray, 2021). The level of homeownership is relatively high¹ and the family home is the single biggest asset on household balance sheets (RBA, 2022: Chapter 2). Real estate markets and mortgage finance are relatively lightly regulated and markets for mortgage-backed securities relatively deep (Kohler, 2021). With a small public housing sector, minimal protection for renters and a pared back social safety net, home ownership is central to the economic security of Australian households. It is widely acknowledged, for example, that home ownership is amongst the most important factors in determining elderly poverty (Australian Government, 2020: Chapter 5). As a result of these combined supply-side and demand-side factors, the housing boom has been particularly pronounced in Australia. Real-estate prices have seen sharp growth alongside mortgage debt levels, which remain amongst the highest in the OECD (Day, 2019).

Housing consequently features prominently on the balance sheets of Australian households, generating large and illiquid asset and liability positions typical of balance sheet formations that characterise ‘wealthy hand to mouth households’ (Kaplan et al., 2014) and ‘the squeezed middle class’ (OECD, 2019). High transaction costs associated with housing, for example, expose households to vulnerability to shocks by limiting their capacity to respond by adjusting expenditure. Moving to a cheaper rented home, let alone selling a home, is costly and time consuming. Yet such essentially fixed expenditure – what Chetty and Siedl (2007) call ‘consumption commitments’ – dominate household budgets, leaving households with slim buffers with which to respond to shocks (Lim and Tsiaplias, 2019). Like other OECD countries, significant evidence of dynamics like debt deleveraging (Mian and Sufi, 2017) and high sensitivities to transitory income shocks (Kaplan et al., 2014) are in turn found in Australia.

¹ At around 70% of all households, roughly half of which are outright owners and the other half mortgagees. See Australian Bureau of Statistics data on the Australian Institute of Health and Wellbeing website at <https://www.aihw.gov.au/reports/australias-welfare/home-ownership-and-housing-tenure>.

However, these dynamics are not driven by housing alone. Like in other OECD countries, rising costs associated with healthcare, education and childcare – many of which entail illiquid contractual commitments – stretch household budgets, alongside cost increases for domestic power, vehicle fuel and insurance. Many of these costs fall into the contractual commitment category because of high transaction costs associated with liquidation, including contract termination fees and penalties. Others, like utilities and fuel, have contractual commitment-like properties because they are difficult to adjust (Chetty & Szedl, 2007: 841). Figure 1 shows change in household expenditure of key consumption categories as well as change in household income, equivalised for the size of the family.² The Figure shows that expenditure growth on these key categories has far outstripped the growth in household incomes (shown in the horizontal orange line).

--- Figure 1 ---

In the case of home insurance, cost rises have been particularly sharp although those costs do not involve illiquid contractual features, with premiums paid on an annual or monthly basis generally without penalties for reversing the contract. Home insurance premiums³ have however tripled in cost over the 14 year period to 2018 with premiums reported to have risen even more sharply in the years since.⁴ These sharp cost rises are driven by the higher payouts faced by insurers amidst the intensification of climate-related disasters in Australia over recent years (Actuaries Institute, 2022). Despite this considerable climate induced pressure on the sector, there is little appetite for major government intervention in the market, which has traditionally been relatively lightly regulated, broadly competitive and free of any kind of public option or subsidy. Although there is remarkably little data available on under- and un-insurance or even on household expenditure on insurance products,⁵ the evidence would suggest that premium rises add significant new cost of living pressures to balance sheets already tightly bound across an array of increasingly expensive positions, many of which are in illiquid contractual commitments that are effectively fixed over the medium term.

This paper contributes to research on underinsurance in relation to which substantial gaps in the literature remain, in no small part due to data limitations.⁶ Existing literature, for example, tends to assume that affordability issues are the domain of low-income households and can be captured by simple income threshold analysis (Kunreuther and Michel-Kerjan, 2009: 122; Hudson et al., 2016; Tesselaar et al. 2020). Although household liquidity constraint and underinsurance has been explored in developing economy contexts (Lui et al., 2016; Calaburi and Willis, 2018; Cole et al., 2013), there is remarkably little engagement in the literature on how liquidity constraint or

² Equivalisation is calculated as per the Australian Bureau of Statistics' formula of 1 point for the first adult plus 0.5 points for any additional persons aged 15 and over plus 0.3 points for any child aged under 15.

³ The standard insurance contract covers either the home or home and contents combined. In locations deemed high risk by the insurer an additional 'flood levy' may be required to cover flood risk and a deductible, known as an 'excess', is set at the initiation of the contract and is payable in the event of a claim – a higher excess reduces the cost of the annual premium and vice versa.

⁴ See the Insurance Council of Australia datahub at [Data hub - Insurance Council of Australia](#) and Author (2022).

⁵ The ABS released its final Household Expenditure Survey data in 2015.

⁶ Underinsurance is difficult to collect data on because of the requirement of effective assessments of both insurable assets and often complex details of insurance contracts, such as the dollar value of maximum payouts and excesses as well as additions such as flood cover.

financial stress more broadly might impact insurance decisions. This gap extends to the considerable body of research in behavioural economics (Harrison and Ng, 2019, Kunreuther and Pauly, 2005) and to that outside of economics, which explores household insurance decisions (Booth and Kendal, 2020). Indeed HILDA data is unique for its detailed coverage of household assets and liabilities, insurance expenditure and indicators like financial stress in a panel format. This allows the present study to explore emerging dynamics where large and illiquid household balance sheets intersect with new cost pressures that reflect growing climate risks.

Data and results

This analysis seeks to identify if the experience of financial stress amongst liquidity constrained households prompts those households to cut their insurance in order to maintain their contractual commitments. To do this, we use HILDA data, which surveys around 17,000 households every year on topics including assets, income, expenditure and financial stress. We focus on households who are initially not financially stressed but experience financial stress at some point over a four-year period and compare their insurance expenditure. We control for changes in assets and observe any changes in their contractual commitments over the period.

More specifically, the sample is constructed in four steps. We:

1. Start with the full sample of HILDA respondents in 2018, which is 17,434 households;
2. Keep those whose income, financial stress status and insurance expenditure is observed in each of the 5 years and who did not report negative income in any year, leaving us with 9,778 households;
3. Exclude those who don't have insurance in 2014, reducing the sample further to 8928; and
4. Exclude those who reported financial stress in 2014.

This leaves us with a sample of 7,481 households who in 2014 both were *not* financially stressed and *did* hold insurance.

Our dependent variable is insurance expenditure, which is reported as an annual expenditure in every year of the survey and covers home, contents and vehicle insurance, excluding health insurance.

The main explanatory variable is financial stress, which is measured as 1 if an individual reports any of 8 indicators of financial stress. Financial stress indicators, which were developed by the Australian Bureau of Statistics and are used in each year of the HILDA survey, ask questions about the preceding year. These include questions such as if households couldn't afford to pay utilities bills on time, if they asked for financial help from friends or family and if they couldn't afford to heat their home. Of these, the most commonly reported indicator of financial stress in our sample is the indicator that reports that households have asked for financial help from friends or family.

We control for changes in assets to avoid falsely equating reductions in insurance expenditure with reductions in insurance coverage in cases where reduced expenditure arises as a result of reduced asset holdings. The controls cover the value of vehicles and the number of properties

owned by the household as well as the size of the home, measured by the number of bedrooms. These controls anticipate the possibility of households reducing vehicles, selling an investment property or moving into a smaller home that costs less to insure. We also control for households moving from a home owned by the household to a rented home, given that home (but not contents) insurance is the responsibility of the property owner.

It is noted that the cost of the average home insurance premium grew by 13% in real terms between 2014 and 2019.⁷ This suggests that any reduced insurance expenditure that we identify is unlikely to be driven by households finding cheaper premiums for the same cover. Given that premiums are on a clear path of increasing and given that we are able to control for key assets, any reductions in insurance expenditure that we identify are likely to generate reduced coverage.

Because household assets are only reported every four years, our sample effectively collapses into the two years of 2014 and 2018. The econometric estimation is as follows:

$$Insurance_{it} = a_0 + b_1 Stressed_i + b_2 Stressed_i X After_t + \sum_{k=1}^K G_k x_{ikt} + r_i + y_t + e_{it}$$

Here $Insurance_{it}$ is household insurance spending reported by household in year t , $Stressed_i$ equals 1 if a person reports at least one of the financial stress indicators in 2015, 2016, 2017, or 2018, while $After_t$ is an indicator for year 2018, G_k is a control variable k (usually, the cost of other insurable items), r_i is individual fixed effect, and y_t is a year fixed effect. Here, b_2 is the coefficient that shows the effect of income stress on insurance spending.

In order to stratify the sample by degrees of liquidity constraint, we construct a measure of contractual payments as a ratio of household income. This category of payments is similar to Chetty and Szedl's (2007) 'commitment goods', capturing the degree to which households are tied into tight balance sheets by marking out spending on goods and services that involve a contract which imposes illiquidity. Liquidating a contract for housing, for example – be that rent or mortgage – involves both time and significant cost. Childcare and education, on the other hand, are illiquid because they are paid in advance for set periods and generally cannot be revoked before the period is over. Moreover, there are significant constraints on availability for both schooling and childcare which inhibit substitution for cheaper options. The measure of contractual commitments also includes health insurance, because benefits accrued over time are lost if the contract is cancelled;⁸ as well as spending that is 'locked in' insofar as it cannot generally be reduced without considerable change in circumstances or loss of quality of life, like fuel for driving and for heating the home.

More specifically, the measure of contractual payments aggregates expenditure on mortgage repayments either for the primary or any additional home as well as rent, childcare, education fees, private health insurance and telephone and internet charges, which are often contractualised; and finally electricity and gas, and fuel for driving. The contractual payments measure then divides the total of that annual expenditure by income in order to reflect a degree

⁷ See figures at the Insurance Council of Australia's datahub at [Data hub - Insurance Council of Australia](#).

⁸ For example in clauses that designate the policy holder ineligible to make a claim in the first year of the policy. Our treatment of health insurance is in line with Chetty and Szedl's (2008) in their measure of commitment goods.

of cashflow constraint. Households are then divided into quartiles to offer four contrasting categories, from those with the least- to the most liquidity constrained.

We begin the statistical analysis by verifying that patterns of insurance expenditure are reasonably consistent across our sub-samples of stressed and non-stressed households. Such parallel trends are confirmed in the four panels in Figure 2, which track median insurance expenditure amongst households who remain unstressed from 2014 to 2018 and those that are unstressed in 2014 but report an indicator of stress in at least one of the years that follow. These trajectories are represented for households in each quartile of liquidity constraint, from the least to most liquidity constrained. These preliminary results reflect a general trend by which households that become stressed over the period tend to spend less on insurance. Importantly for our analysis, however, is that expenditure between the control and treatment group move in the same direction until 2015, when households in the treatment group begin to experience stress. These preliminary results suggest that any changes in insurance expenditure amongst the two groups will likely be caused by the financial stress experienced by the second group rather than by another variable that has not been accounted for. We interrogate these results further below using regression analysis with controls for changes in assets.

--- Figure 2 (i-iv) ---

Table 1 shows how much less households who have experienced financial stress at some point during the period spend on insurance at the end of the period compared to households who have not experienced stress, with controls for assets in place. These results are stratified by the measure of liquidity constraint, constituted by the ratio of contractual spending to income. The table shows that households who experienced stress and are in the least constrained quartile spend an average \$89 less on insurance than households who *didn't* experience stress and are in the same quartile of liquidity constraint. Households that experienced stress and are in the second and third quartiles of liquidity constraint spend between \$141-149 less on insurance than those in the same quartiles of liquidity constraint who *didn't* experience stress. Those who experienced stress and have the most liquidity constrained balance sheets dropped their insurance spending by the most (\$179) compared to those in the same quartile of liquidity constraint who *didn't* experience stress. In each case, results are statistically significant at the 5% threshold.

These results support the proposition that households that are tied into tight balance sheets and may have few options to address an income or expenditure shock are more likely to cut their insurance coverage to respond to that shock than households who have more discretionary spending power available in their weekly budget.

--- Table 1 ---

Our estimations control for the value of assets and thereby to some degree bypass the link between higher incomes and higher insurance expenditure. Nonetheless, in order to better understand the role of income dynamics, it is important to investigate the distribution of income within quartiles of liquidity constraint. This allows us to guard against the possibility that the results are being driven by income rather than liquidity constraint. We do this in Table 2, which calculates the income distribution of those who reduced their insurance expenditure in each of

the four quintiles of liquidity constraint. This shows that income is remarkably evenly spread across those quintiles. The second, third and fourth quintiles in particular show very similar patterns through the first quartile, median and third quartile of household income.

This suggests that the most liquidity constrained households, who reduced their income expenditure by the most, have a very similar income profile to those with looser balance sheets, who reduced their insurance expenditure by less. This in turn suggests that greater reductions in insurance expenditure is driven not by differences in income and thus by the greater magnitudes of insurance expenditure amongst wealthier households but by differences in liquidity constraint generated by balance sheet tightness.

--- Table 2 ---

Finally, we capture the degree to which households who reduce their insurance maintain their contractual payments over the period. Descriptive statistics in Table 3 present nominal spending on contractual payments amongst households who reduce their insurance expenditure, comparing that inflation-adjusted spending in 2014 and 2018. This shows that median contractual spending stayed fairly stable over the period, suggesting that, in general, households who cut their insurance in the wake of financial stress did not reduce their contractual payments. Rather they cut their insurance expenditure but maintained contractual spending.

--- Table 3 ---

Table 4 explores the relationship between contractual spending and insurance spending further. The table shows change in insurance expenditure for households that have experienced stress, which is regressed on contractual commitment expenditure and includes controls for the value of assets. The results show a clear, statistically significant link between contractual commitments and insurance expenditure that remains valid with controls for the value of assets. More specifically, the results show that higher contractual commitment expenditure translates into a drop in insurance expenditure on a one-to-one basis in our preferred specification. This suggests a substitution effect by which households that experience financial stress choose to reduce insurance costs by reducing insurance coverage in order to maintain their contractual commitments.

--- Table 4 ---

We undertake a number of robustness tests. Although we are unable to confirm the findings with earlier data due to data limitations,⁹ we check for robustness across our eight financial stress indicators by running the regressions eight times, excluding a different financial stress indicator in each case. The results tables are displayed in the appendix, covering insurance expenditure for

⁹ Specifically, financial stress indicators are unavailable for 2010 and insurance expenditure is unavailable for 2002. As a result, the analysis can't be replicated either for the four-year period prior to 2014 or the earlier period spanning the wealth modules with which the controls can be constructed, in 2002 and 2006.

each of the quartiles of balance sheet tightness (as per Table 1) as well as the relationship between insurance expenditure and commitment goods spending (as per Table 4). These checks confirm robustness across the various financial stress indicators.

Discussion

The potential for households to absorb shocks by taking on underinsurance risks presents at once an important policy problem and a novel contribution to theoretical analysis of how risk is being shared between markets and households as household balance sheets expand. Playing out at the intercept of the rapid emergence of climate risk exposure and the expansion of financial precarity that has been documented by the literature since the 2000s, this set of problems is in some respects new but in others representative of a dynamic of shock absorption that is inherent to the positioning of households in financial markets. What is remarkable about the problem of households choosing to underinsure in order to meet their contractual payments is that it is such a vivid example of households taking on new risks in order to manage a shock.

The rapid realisation of climate risk in higher insurance premiums makes this an urgent policy problem. This is all the more so in an economy like Australia's, which is both highly exposed to weather-related disasters and in which housing plays such a central role in the economy and the economic security of households at large. The analysis thus shows how new climate risk exposure brings a new set of challenges to financially stressed households. Our results suggest that the channel of underinsurance has emerged as a very risky but nonetheless relatively common strategy with which to tide the household balance sheet over in the face of a shock. This suggests that financial stress has become considerably more dangerous. Moreover, the more expensive that insurance premiums become, the bigger a plug that skipping insurance payments offers for the leaky balance sheet of financially stressed households. That is, the role of underinsurance in household shock absorption is likely to grow over time as premiums themselves grow as a reflection of the growing costs of weather-related disasters.

This adds a useful dimension to the literature on underinsurance, which has not directly addressed liquidity constraints and insurance coverage outside of agricultural insurance in developing countries (Lui et al., 2016; Calaburi and Willis, 2018; Cole et al., 2013). Specifically, it shows that underinsurance is spread far higher up the income distribution than previously thought. As new data sources emerge over coming years in response to the policy imperatives of addressing underinsurance,¹⁰ there is considerable scope to further expand empirical work on the nature of underinsurance. Moving beyond basic income thresholds to engage with complexity in household decisions is central to the task of understanding underinsurance (Booth and Kendal, 2020). Our analysis offers one new and important piece of this puzzle, thereby contributing to the broader policy agenda of understanding the risks that climate change poses to households and the economy at large, and the way that households are responding to that risk.

However, the findings that households take on new risks to absorb shocks also contributes to debates about the growing role of household in financial markets by identifying new dynamics

¹⁰ The HILDA survey, for example, will include much more detailed questions on underinsurance in coming years, although it will take considerable time for that data to become available to researchers.

that are of salience to how we understand households' capacity to bear risks associated with bigger balance sheets. Our results show households taking on substantial new risks – that is, risks associated with underinsurance – so that they can absorb the shock that has driven them into financial stress without passing that shock on to markets by defaulting, hedging or somehow insuring against that shock. This demonstrates the cost of shock absorption being paid by households in the form of new risks accrued to the household balance sheet, marking out a new channel by which the shift towards large and illiquid household balance sheets position households poorly as financial market actors. This dynamic is reflected in the seminal work of Chetty and Szedl (2007), who focus on the impact of contractual payments – what they call 'commitment goods' – on the economic behaviour of households.¹¹ Like the 'wealthy hand-to-mouth' of Kaplan, Violante and Weidner (2014), at issue is an illiquidity on household balance sheets that limits household responses to a shock. By presenting evidence of a link between underinsurance and these large and illiquid balance sheets, our analysis reveals an important vulnerability that demonstrates households' poor capacity to take on the kinds of risks that are passed on to them as their engagement with financial markets intensifies in a context of greater economic insecurity.

More broadly, our work contributes to how we understand the way that risk is distributed between households and markets as household engagement in markets intensifies in a context of declining social protection. As Bryan and Rafferty (2018) make clear, this distribution of risk – or shock absorption – is critical to the conditions in which household payments assume an increasingly important role in originating regularised and secure payment streams into markets. Bryan and Rafferty point out that households are uniquely disadvantaged amongst other financial market actors by social constraints. Households might for example be hesitant to reverse contractual commitments like school fees and mortgage or rent payments, not only because of the financial costs involved but also because of the social disruption entailed in changing schools or suburbs. This adds an additional layer of transaction costs – social transaction costs – to the cost of penalties for breaking a contract that non-social actors entail.

Our results build on this, showing a distinct set of implications associated with that unique positioning of households in markets. We observe households taking on significant new risks to maintain their contractual commitments in the face of a shock. This demonstrates dynamics of shock absorption and risk distribution that paint a richer picture of how risk dynamics change as households take more substantial positions in markets. More specifically, our results contribute to a better understanding of the cost – a cost of risk and a potential cost of damage to uninsured homes – incurred by households in their delivery of stable payment streams into markets. This framing follows Bryan and Rafferty (2018) in exploring an important characteristic of household debt by which household debt becomes more reliable from the market's perspective because of the tendency of households to absorb shocks on behalf of markets.

Conclusion

¹¹ Chetty and Szedl (2007) examine how high ratios of contractual commitments to income change risk tolerance amongst households. They find that tight balance sheet households are more risk averse in relation to small and medium risks than conventional modelling assumes and have stronger motive to take part in high-payoff gambles. Insofar as Chetty and Szedl propose that up to a certain tipping point, tight-balance sheet households try harder to maintain their contractual commitments than conventionally expected, our results can be interpreted as supportive.

A rich body of literature identifies greater susceptibility to financial stress amongst households as they juggle bigger balance sheets in a context of declining social protection (Hacker, 2006). Households, for example, have smaller buffers but more and bigger payment commitments, leaving them with little room to manoeuvre across unbalanced portfolios that are dominated by large and illiquid positions (Chetty and Szedl, 2007; Lim and Tsiaplias, 2019; Kaplan et al., 2014; Bryan and Rafferty, 2018). Our results show that, in this context, there is an important emerging interaction with the capacity of households to protect their most important asset under conditions of growing climate risk. More specifically, our analysis of Australian household panel data shows that households tend to reduce their insurance expenditure in the wake of financial stress. With the use of controls for assets, these results suggest that households choose to reduce insurance coverage. Moreover, our results show that the greatest reductions in coverage occur amongst households that have higher ratios of contractual commitments to income. In fact, our analysis of contractual spending suggests a substitution effect: households that experience financial stress tend to cut their insurance coverage but maintain their contractual spending, suggesting that they reduce insurance coverage in order to free up cashflow so that they can stay ‘on payment’ for contractual commitments.

These interactions reflect that households are poorly placed to bear the risk of big balance sheets. Given the potential for economically catastrophic outcomes for households that take on this order of risk, these results suggest that others – be they markets or the state – may well be better placed to absorb the kinds of shocks that drive households into stress. More specifically, shocks may be better managed through a stronger safety net to support households through episodes of financial stress or a configuration of policies that address issues on the insurance side. In lieu of a rapid policy response, the inherent disadvantage that characterises households as financial market actors will lurch into economic catastrophe for those unlucky households who lose out on the under-insurance gamble as the risks associated with big balance sheets accumulate – from financial stress to under-insurance in a dangerous new climate.

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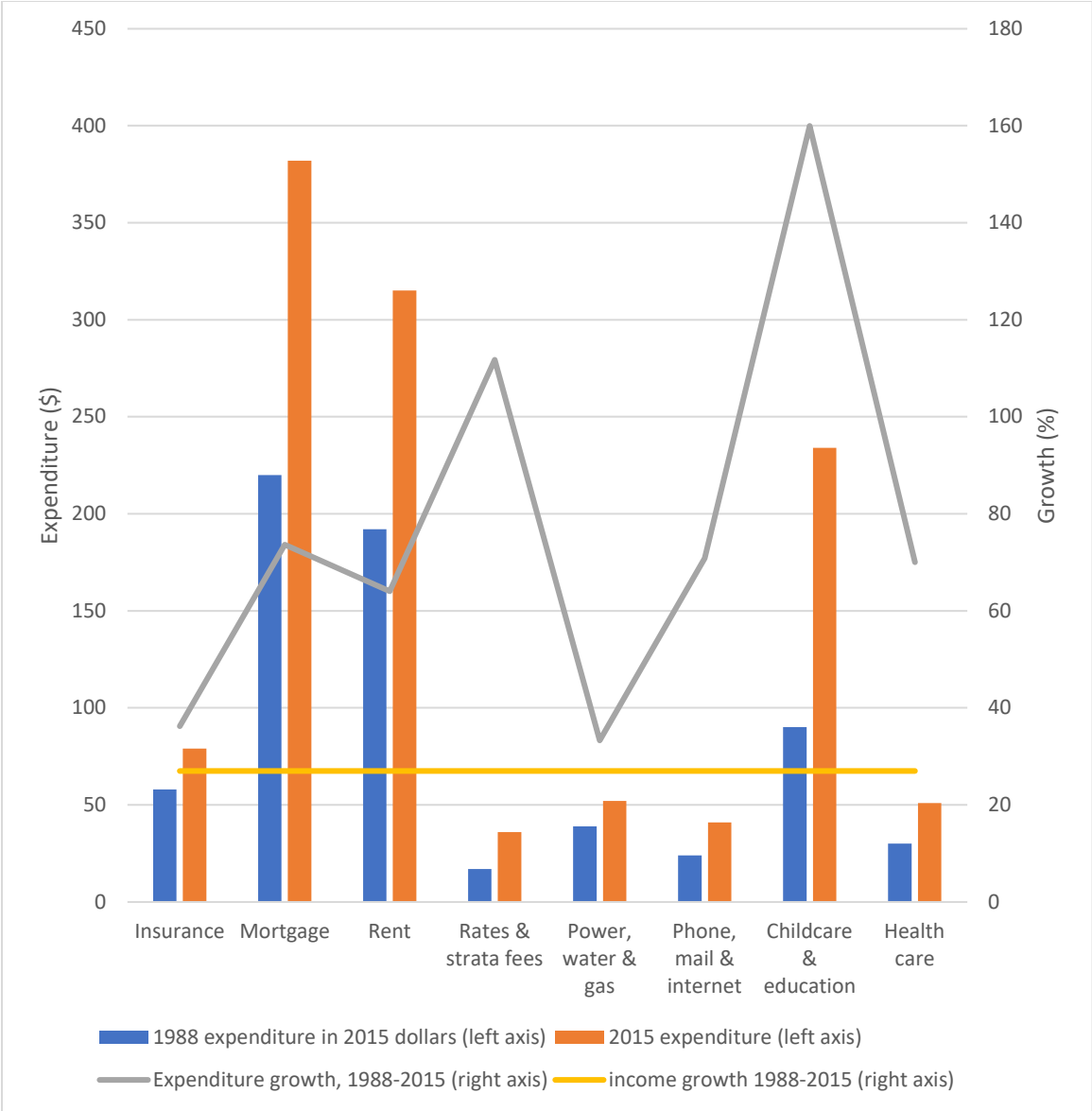
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Tables and Figures

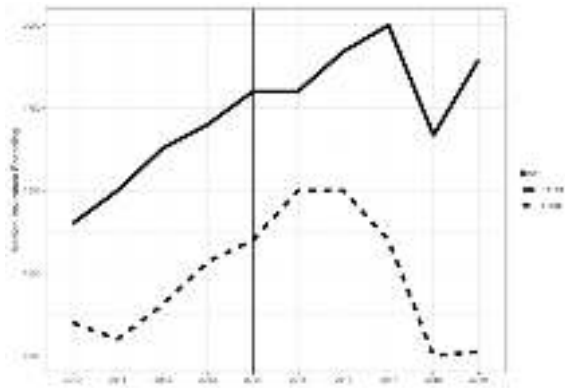
Figure 1: Weekly household expenditure on selected categories in constant dollar



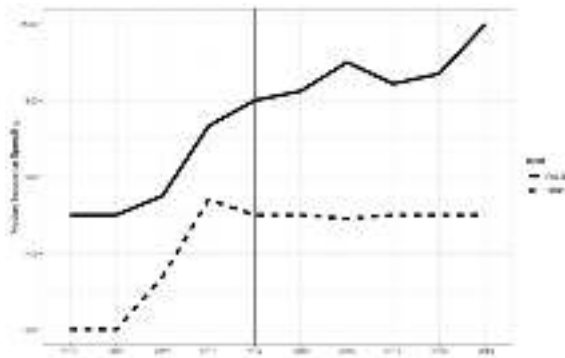
Source: Household Expenditure Surveys, 1988 and 2015 from the Australian Bureau of Statistics.

Figure 2: Trends in insurance expenditure amongst non-stressed households (black line) and households that experienced financial stress after 2014 (dashed line), by liquidity constraint quartile in 2018

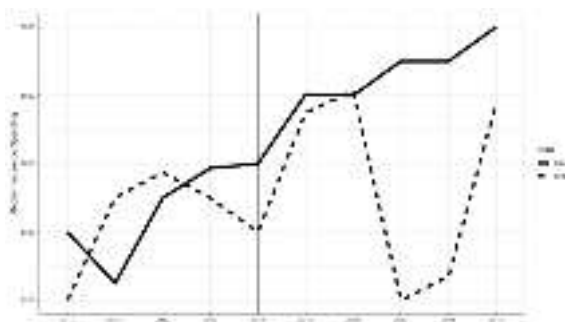
(i) Quartile 1



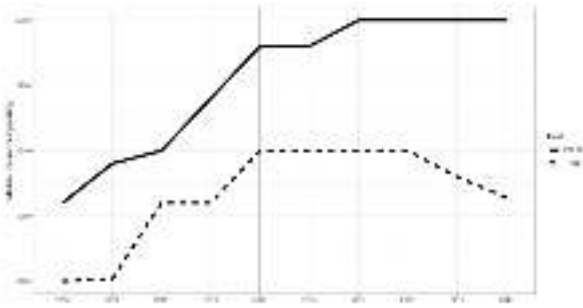
(ii) Quartile 2



(iii) Quartile 3



(iv) Quartile 4



Source: HILDA, 2014, 2015, 2016, 2017 and 2018.

Table 1: Changes in spending on insurance by households that experienced financial stress after 2014

	Model 1	Model 2	Model 3	Model 4
I(treat * after)	-89.051*** (0.000)	-149.319*** (0.000)	- 140.911*** (0.000)	- 179.419*** (0.000)
vehicles	0.001*** (0.000)	0.002*** (0.000)	0.006** * (0.000)	0.001** * (0.000)
I(vehicles * after)	0.000*** (0.000)	0.005*** (0.000)	0.002** * (0.000)	0.001** * (0.000)
owningTRUE	517.590*** (0.000)	775.007*** (0.000)	278.998*** (0.000)	987.568*** (0.000)
I(owning * after)	292.262*** (0.000)	-33.072*** (0.000)	550.077*** (0.000)	115.439*** (0.000)
hsbedrm	153.409***	148.971***	271.502***	- 7.503** *

	Model 1	Model 2	Model 3	Model 4
	(0.000)	(0.000)	(0.000)	(0.000)
I(hsbedrm * after)	-13.743***	-37.566***	- 30.516* **	42.367* **
	(0.000)	(0.000)	(0.000)	(0.000)
dtrpiTRUE	-16.875***	61.290***	189.697 ***	156.620 ***
	(0.000)	(0.000)	(0.000)	(0.000)
I(dtrpi * after)	236.601***	283.239***	- 55.866* **	368.455 ***
	(0.000)	(0.000)	(0.000)	(0.000)
opnum	96.364***	294.849***	170.767 ***	385.040 ***
	(0.000)	(0.000)	(0.000)	(0.000)
I(opnum * after)	82.411***	-7.517***	- 41.905* **	- 18.373* **
	(0.000)	(0.000)	(0.000)	(0.000)
Num.Obs.	4632	3665	3512	3142
R2	0.718	0.697	0.726	0.733
FE: xwaveid	X	X	X	X
FE: year	X	X	X	X

Note: Columns refer to quartiles of liquidity constraint.

Source: HILDA, 2014, 2015, 2016, 2017 and 2018.

Table 2: The distribution of household income across liquidity constraint quartiles

<i>Quartiles of cashflow tightness</i>	min	Quartile 1	Median	Quartile 3	max
Quartile 1	699	36,596	65,430	113,053	847,369
Quartile 2	7,000	51,537	86,956	128,406	333,147
Quartile 3	7762	47,749	89,756	127,554	847,369
Quartile 4	1800	48,190	84,532	116,077	464,944

Source: HILDA, 2014, 2015, 2016, 2017 and 2018.

Table 3: Spending on contractual commitments in 2014 and 2018 amongst households who cut their insurance spending following the experience of financial stress (in constant dollar terms)

	Minimum	Quartile 1	Median	Mean	Quartile 3	Maximum
Pre-stress contractual spending	486	11,880	23,654	26,838	36,116	207,584
Post-stress contractual spending	0	11,281	23,351	26,076	35,402	162,936

Source: HILDA, 2014, 2015, 2016, 2017 and 2018.

Table 4: Insurance expenditure amongst households that experienced financial stress after 2014 regressed on change in contractual spending between 2014 and 2018 (in constant dollar terms)

	(1)	(2)	(3)	(4)
hxyoii	3.343** *	3.331** *	2.844** *	2.828** *
	(0.624)	(0.000)	(0.643)	(0.643)
I(hxyoii * after)	-0.880+	- 1.007** *	-0.986+	-1.143*
	(0.476)	(0.000)	(0.543)	(0.545)
vehicles		0.007** *	-0.003	-0.002
		(0.000)	(0.010)	(0.010)
I(vehicles * after)		0.015** *	0.016	0.014
		(0.000)	(0.012)	(0.012)
owningT RUE			4968.21 9***	5293.49 8***
			(1306.55 1)	(1308.06 6)
I(owning * after)			629.535	414.897
			(1054.85 7)	(1048.64 4)
hsbedrm			2929.00 8***	2933.98 7***
			(694.454)	(690.237)
I(hsbedr m * after)			-795.959	-961.457

	(1)	(2)	(3)	(4)
			(619.787)	(616.851)
dtrpiTR UE			341.550	234.837
			(1773.04 1)	(1771.70 2)
I(dtrpi * after)			- 1766.77 3	- 1540.69 8
			(1809.82 9)	(1806.36 6)
opnum				-73.601 (786.298)
I(opnum * after)				1898.58 7** (705.215)
Num.Ob s.	2857	2857	2857	2857
R2	0.816	0.817	0.827	0.828
R2 Adj.	0.632	0.632	0.650	0.652
R2 Within	0.116	0.119	0.165	0.171
R2 Within Adj.	0.115	0.116	0.160	0.164
AIC	62654.4	62650.5	62506.3	62489.9
BIC	71191.5	71199.5	71091.1	71086.6
RMSE	8472.23	8460.56	8232.41	8203.03
Std.Erro rs	by: xwaveid	by: year	by: xwaveid	by: xwaveid

	(1)	(2)	(3)	(4)
FE: xwaveid	X	X	X	X
FE: year	X	X	X	X

Source: HILDA, 2014, 2015, 2016, 2017 and 2018.

Appendix

As discussed on page 9, tests check for robustness across each of the eight financial stress indicators in relation to both insurance expenditure following a shock (in correspondence with Table 1) as well as the relationship between insurance expenditure and commitment goods expenditure (in correspondence with Table 4).

The first four panels, below, break the results down into the four quartiles of liquidity constraint, as per Table 1, excluding one single financial stress indicator for each row. The results show high levels of significance that hold across financial stress indicators and quartiles of liquidity constraint.

Quartile 1

Excluded variable	Coefficients	Standard error	T-stat	Observations (N)
Prosperity given current needs - poor	-67.6	0.0	-369753179118928.0	4651
Couldn't heat home	-78.0	0.0	-7916245063920.4	4655
Couldn't pay rent/mortgage on time	-54.5	0.0	-9102357761240.0	4633
Sought help from charity	-92.9	0.0	-11916517971419.8	4647
Missed meals	-43.0	0.0	-15534832392477.6	4641
Pawned or sold something	-49.3	0.0	-8809239214774.0	4649
Asked for help from family or friends	61.2	0.0	9344392395139.0	4736
Couldn't pay utilities on time	-195.4	0.0	-48372620879188.0	4723

Quartile 2

Excluded variable	Coefficients	Standard error	T-stat	Observations (N)
Prosperity given current needs - poor	-149.6	0.0	-7235342055902.4	3667
Couldn't heat home	-165.1	0.0	-16040369839872.5	3655
Couldn't pay rent/mortgage on time	-117.8	0.0	-52402852682257.5	3663
Sought help from charity	-134.1	0.0	-31206072719080.9	3659
Missed meals	-144.4	0.0	-16924064623323.0	3655
Pawned or sold something	-176.9	0.0	-10121849853617.9	3677
Asked for help from family or friends	-109.0	0.0	1051773196476620.0	3800
Couldn't pay utilities on time	-172.5	0.0	-29899276847166.4	3808

Quartile 3

Excluded variable	Coefficients	Standard error	T-stat	Observations (N)
Prosperity given current needs - poor	-148.4	0.0	-11513897610916.0	3514.0
Couldn't heat home	-144.4	0.0	-20791630955594.4	3518.0
Couldn't pay rent/mortgage on time	-143.6	0.0	-14351958473333.5	3514.0
Sought help from charity	-120.3	0.0	-4295442396421.6	3516.0
Missed meals	-176.1	0.0	-23074270988413.5	3510.0
Pawned or sold something	-197.8	0.0	-517758944802591.0	3536.0
Asked for help from family or friends	-209.9	0.0	-59887821310522.2	3718.0
Couldn't pay utilities on time	32.2	0.0	2729310727500.3	3740.0

Quartile 4

Excluded variable	Coefficients	Standard error	T-stat	Observations (N)
Prosperity given current needs - poor	-303.5	0.00	-22179267277172.4	3144
Couldn't heat home	-304.5	0.00	-25679011469320.0	3150
Couldn't pay rent/mortgage on time	-246.8	0.00	-35999788177805.6	3152
Sought help from charity	-270.9	0.00	-28254469263462.3	3142
Missed meals	-281.6	0.00	-12223547589713.8	3142
Pawned or sold something	-292.3	0.00	-16175941656207.8	3194
Asked for help from family or friends	-276.4	0.00	-17653826206641.2	3412
Couldn't pay utilities on time	-94.9	0.00	-8986029914031.3	3380

Our second robustness test similarly tests for robustness across financial stress indicators. Below, robustness is shown across indicators in relation to the substitution effect shown in Table 4 between insurance expenditure and expenditure on contractual commitments. Again, the regression is run eight times with one financial stress indicator excluded on each occasion. The results show robustness across indicators although the results are weakened when the most common indicator of financial stress is omitted. This omission delivers the lowest sample and a drop in the t-score below 164.

Excluded Variable	Coefficients	Standard Error	T-stat	Observations (N)
Asked for help from family or friends	-0.91	0.61	-1.49	2305
Couldn't pay utilities on time	-1.10	0.50	-2.19	2523
Pawned or sold something	-1.04	0.56	-1.87	2641
Sought help from charity	-1.09	0.55	-1.98	2791
Couldn't heat home	-1.16	0.55	-2.10	2801
Missed meals	-1.19	0.55	-2.14	2813
Prosperity given current needs - poor	-1.14	0.55	-2.06	2817
Couldn't pay rent/mortgage on time	-1.07	0.55	-1.95	2821



60
YEARS
IMPACT