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# ABSTRACT

# For Worse? Financial Hardships and Intra-Household Resource Allocation among Australian Couples*

This paper considers the association between intra-household resource allocation and couple financial hardships in Australia. It develops and estimates a collective household model of expenditures on individual-specific necessities and hardship reporting where each partner has a distinct utility function and household decisions are assumed to be Pareto efficient. Using data from the 16th wave of the Household, Income, and Labour Dynamics in Australia Survey with unique questions on individual financial hardships, this paper addresses disadvantage brought about by financial hardships that may be shaped in part by the distributions of preferences and bargaining power within households. Wives report more hardships than husbands. Estimates indicate that wives have weaker preferences than husbands for expenditures on necessary goods for themselves, but there is no evidence of differences in bargaining power. Estimates further indicate that hardships increase with the number of children and each spouse's disability status and decrease with their ages and subjective financial capabilities.

**JEL Classification:** D12, D13, I31

**Keywords:** financial hardship, intra-household allocation, couples, Australia

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## 1. Introduction

Economic wellbeing is distributed unequally across households. It may also be distributed unequally within households based on the gender and other characteristics of each member. A large body of research has examined how personal and household characteristics—especially spouses' preferences and bargaining power—affect intra-household distributions of consumption expenditures (Blacklow and Ray, 2003; Browning et al., 2013; Maitra and Ray, 2005), labour supply (Mariotti et al., 2016; Rapoport et al., 2011), savings (Lee and Pocock, 2007), wealth (Grabka et al., 2015), and financial satisfaction (Bonke and Browning, 2009; Bütikofer and Gerfin, 2017). Many of these studies have used the collective household model framework (c.f. Chiappori, 1988, 1992; Browning et al., 1994, 2013, 2014) and its property of a tractable resource sharing rule to study allocations and formalise their analyses.

Mayer and Jencks (1989) brought attention to the distinction between people's economic resources and their experiences of material hardships. Their study and most research conducted since then for developed countries has considered hardships at a household or family level or hardships experienced by types of people, such as parents or children. Only a few studies have examined how hardships vary for specific individuals within households.

Cantillon and Nolan (2001) examined Irish couples and documented that wives were slightly more likely than husbands to report experiencing hardships or deprivations. However, subsequent studies by Cantillon (2013) and Cantillon et al. (2016) uncovered few overall differences by gender. Breunig et al. (2007) investigated differences in Australian couples' reports of financial hardships. They found that husbands and wives frequently differed in their reporting, with wives being marginally more likely than husbands to indicate hardships. They

also found that differences were more common in middle ranges of the income or disadvantage distribution and less common at the extremes. Siminski and Yerokhin (2012) used couple reports in a different way—as controls for common underlying hardships and to test differences in reporting behaviour. While several of these studies point to intra-household differences, none is formally embedded in a non-unitary household decision-making framework, such as the collective household model, which directly accounts for separate preferences and differences in spouses' bargaining power.[1]

We address these issues and bring new evidence to bear on gender-specific resource allocations by investigating Australian husbands' and wives' experiences with individually experienced financial hardships, such as going without a meal or having to ask friends or family for financial help. We develop a collective household model of expenditures on individual-specific necessities and hardship reporting, which includes the unique utilities of each spouse and weights them by a Pareto weight. Just as parameters of preferences and the Pareto weight can be identified in cases of individually assignable expenditures or other individual-specific outcomes, our model is able to identify them through individually experienced hardships.

We estimate a structural empirical specification of this model using data from the 16$^{th}$ wave of the Household, Income, and Labour Dynamics in Australia (HILDA) Survey. The HILDA Survey is uniquely suited for this analysis because it asks each adult in each responding household their own experiences with financial hardships, including several that may only affect the individual and not others in the household. The HILDA Survey collects other person-

[1] "Power" has been considered in extreme cases of hardship, such as economic abuse (Stylianou, 2018), but not in more normative contexts of hardships.

specific information, such as people's own incomes, ages, education levels, and health status, that can affect the personal and household incidence of hardships.

Wave 16 from the HILDA Survey is especially useful because it also assessed each adult's financial literacy through a series of five objective questions about financial matters and three additional questions on his or her subjective financial capabilities. Objective and subjective financial abilities affect people's financial behaviours (see, e.g., Allgood and Walstad, 2016; Gerrans et al., 2014; Lusardi and Mitchel, 2014; Schmeiser and Seligman, 2013). We use these measures as direct controls for experiencing hardships. Wave 16 also has measures of risk-taking attitudes, future orientation, impulsivity, and achievement orientation that we include in our analyses.

This paper makes several contributions to the literature. First, we consider measures of financial hardship that have not previously been used within a collective household framework for developed countries. Second, we develop a new empirical approach to identifying the Pareto weight of a collective model through the analysis of individually experienced hardships. Third, unlike most studies of the collective model in developed countries which only consider relatively affluent, dual-earner couples, we examine intra-household outcomes for low- and middle-income couples, including couples with one or no earners. Fourth, it relates people's financial capabilities and their attitudes to their experiences of financial hardships.

## 2. Data

As mentioned, our empirical analyses use data from the 16$^{th}$ wave of the Household, Income, and Labour Dynamics in Australia Survey. The HILDA Survey is a large national longitudinal survey that began with 19,914 people in 7,682 Australian households in 2001 and

has subsequently followed those people and their families in annual interviews. Each wave asks about personal and household economic conditions, demographic circumstances, and other characteristics through interviews about the household, in-person (person questionnaire, or PQ) interviews with each household adult, and self-completion questionnaires (SCQs) for the same adults. Attrition has been modest; by the 16$^{th}$ wave, just under two-thirds of the original survey respondents completed interviews (Summerfield et al., 2017). We extracted the HILDA data with the PanelWhiz add-on for Stata (Hahn and Haisken-DeNew, 2013).

### *2.1 Financial hardships*

The outcome measures for our analyses are individual-specific indicators of husbands' and wives' experiences with financial hardships. The SCQ separately asks each household adult whether, by responding "yes" or "no", any of the following happened to him or her over the past year "because of a shortage of money": (i) "Could not pay electricity, gas or telephone bills on time"; (ii) "Could not pay the mortgage or rent on time"; (iii) "Pawned or sold something"; (iv) Went without meals"; (v) "Was unable to heat home"; (vi) "Asked for financial help from friends or family"; and (vii) "Asked for help from welfare/community organisations."

These hardship measures have been examined by many researchers (Bray, 2001; Bray et al., 2011; Breunig et al., 2007; Butterworth and Crosier, 2006; Cobb-Clark and Ribar, 2012; Ribar, 2015; Siminski and Yerokhin, 2019). Breunig et al. (2007) and Siminski and Yerokhin (2012) have highlighted that some of the hardships, such as not paying bills and not making housing payments, involve outcomes that affect everyone in the household. Other hardships, such as pawning or selling something, may only affect or cause stress to an individual. For our analyses, we consider three individually assignable hardships: pawning or selling something,

going without meals, and asking financial help from friends or family.[2]

### *2.2 Explanatory measures*

We focus on the 16th wave of the HILDA Survey because it included subjective and objective assessments of the adults' financial knowledge. For the subjective measures, the SCQ asked people's agreement (1 = strongly disagree to 7 = strongly agree) with the following statements: (i) "I feel confident about the financial decisions I make"; (ii) "I feel very comfortable dealing with banks and other financial institutions"; and (iii) "I am good at dealing with day-to-day financial matters." An exploratory factor analysis indicated that the responses could be represented by a single factor. We sum the responses to form a (3-21) scale of each person's subjective financial capability (the reliability is $\alpha = 0.81$).

For the objective assessment, the PQ of the HILDA Survey asked each adult five financial literacy questions that covered the relationship between risk and return, diversification of shares, calculation of interest returns, returns accounting for inflation, and income and price inflation. We use the sum of the correct responses (0-5) as a measure of each person's objective financial literacy.

As the primary measure of bargaining power (Datta Gupta and Stratton, 2010) we use the ratio of the wife's predicted total annual income to the sum of the couple's predicted total annual income. For each spouse, we regress the log of his or her total annual personal income on own and spouse's values for a cubic in age, education level, disability, physical- and mental health (each measured from elements of the Short Form Health Survey and ranging from 0-

[2] Breunig et al. (2007) did not consider missing meals because it had a low incidence. Siminski and Yerokhin (2012) included asking help from welfare and community organisations as a common hardship.

100), non-English migrant status, Aboriginal and Torres Strait Islander (Indigenous) background, the number of children, deciles of the Australian Bureau of Statistics (ABS) Socio-Economic Index for Areas (SEIFA) measure for relative socioeconomic advantage/disadvantage (ABS, 2001), and region of residence. Table A1 reports the results from these estimations. From these results, the level of each spouse's income is predicted and used in the calculation of the predicted income share. We center an equal distribution of incomes at zero by subtracting 0.5 from the ratio, which results in a measure that ranges from $-0.5$ and 0.5.

As additional explanatory variables in our analyses of hardships, we include measures of each spouse's age, education, disability status, physical- and mental health, non-English migrant status, and Indigenous background. We include each spouse's willingness to take financial risks, which ranges from 1 ("not willing to take risks) to 4 ("willing to take substantial risks"). We also use three three-item scales from Kempson et al. (2013) of each person's 'future orientation', 'impulsivity', and 'achievement motivation'. We average the responses for each of the three items for each trait, ranging from 1 (low) to 7 (high). As couple-level variables, we include the number of children, whether the couple resides in a rural or urban area, the local-area unemployment rate, the household's SEIFA disadvantage index, total annual household income from all sources and all members, and an indicator for whether a couple is formally married.

**2.3 Analysis sample**

Our analysis sample consists of formally and de facto married couples who were respondents in the 16$^{th}$ wave of the HILDA Survey. Our sample excludes observations for couples if either member failed to complete the SCQ or had missing information for the explanatory variables. Because we are examining financial hardships, we further restrict the

sample to couples whose annual household incomes are less than $100,000, yielding an analysis sample of 2,058 couples.

The choice of the $100,000 annual household income restriction is supported by the results in Table 1, which shows the unconditional incidence of reported financial hardships as well as the incidence above and below the $100,000 threshold. There are clear differences between the two groups, as the incidence of financial hardships is roughly two to three times higher among couples with household income below $100,000 relative to a household income of $100,000 or more.

Focusing now on couples whose annual household income is below $100,000, the incidences of hardships are low with wives being slightly more likely to report hardships than husbands. In the sample, 5.7% of husbands and 6.6% of wives report pawning or selling something, 2.1% of husbands and 2.6% of wives report going without meals, and 11.0% of husbands and 12.6% of wives report asking friends or family for financial help. Consistent with the findings of Breunig et al. (2007), the rates of agreement in the reports are moderate. For all three hardships, it is much more likely that only one spouse reports a hardship than that both spouses report a hardship. The rank correlations for the reports range from 0.38 to 0.56. Table 2 presents summary statistics for all variables. Also consistent with the studies by Breunig et al. (2007) and Cantillon and Nolan (2001), wives report slightly more hardships than husbands.

## 3 Reduced-form results

Table 3 reports the results from an initial reduced-form Multiple Indicator, Multiple Cause (MIMIC) model. Let $H_i^*$ be spouse $i$'s ($i = h, w$) latent propensity to experience financial hardship; let **Z** be a vector of the husband's, wife's, and couple's observed characteristics; and

let $\nu_i$ be a measure of spouse $i$'s unobserved characteristics. We assume that:

$$H_i^* = \boldsymbol{\Pi}_i'\mathbf{Z} + \nu_i, \quad i = h, w, \tag{1}$$

where $\boldsymbol{\Pi}_i$ is a vector of coefficients. We further assume that each spouse's individual *report* of hardship $j$ ($j = 1, J$), $H_{i,j}$, depends on the latent level of hardship and an idiosyncratic error, $e_{i,j}$, such that:

$$H_{i,j} = 1 \quad \text{if} \quad \rho_{i,j} H_i^* + e_{i,j} > \varsigma_{i,j}, \quad i = h, w \quad \text{and} \quad j = 1, J. \tag{2}$$

where $\rho_{i,j}$ is a spouse- and hardship-specific coefficient (loading on the latent hardship variable) and $\varsigma_{i,j}$ is a spouse- and hardship-specific threshold. We assume that $\nu_i$ follows a bivariate normal distribution with an unrestricted variance/covariance matrix and that each $e_{i,j}$ follows an independent standard normal distribution. We also assume that $\rho_{h,1} = \rho_{w,1} = 1$ and that $\varsigma_{h,1} = \varsigma_{w,1} = 0$.

There is little evidence from the reduced-form model that bargaining power matters for either husbands' or wives' financial hardships, as the coefficients on the predicted income ratio—though opposite in sign for husbands and wives—are not significant.

As expected, household income is negatively and significantly related to financial hardships for both husbands and wives. The wife's age is negatively associated with financial hardships among both spouses, whereas own disability and disability of the spouse are related to greater hardships among both spouses (although wife's disability is not related to husband's hardships). For husbands, improvements in their own general and mental health and the wife's general and mental health are associated with fewer hardships, whereas for wives only their own general and mental health is associated with fewer of their own hardships. The subjective

financial capabilities of both spouses are also negatively related to each spouse's hardships. More children are significantly associated with greater hardships for both husbands and wives, and being formally married is significantly associated with fewer hardships for each spouse.

In general, an individual's own characteristics are more strongly associated with his or her hardships than with his or her spouse's hardships, especially for wives. Apart from the results for the predicted income ratio, to which we return to later, the reduced-form results are mostly what we would expect. We now turn to the development and specification of the structural model.

## 4 Theoretical and empirical model

### 4.1 Theoretical model

We frame our empirical analysis more formally in terms of a collective household model of the joint behaviour of a husband and a wife. We assume that each spouse, $i$, has individual egoist linear expenditure system (L.E.S., Stone-Geary) preferences over expenditures on his or her own assignable consumption of necessities, $N_i$, own assignable consumption of other goods, $C_i$, and non-assignable, household public goods, $G$, such that:

$$U_i = \beta_i \ln (N_i - \tau_i) + \gamma_i \ln (C_i - \pi_i) + (1 - \beta_i - \gamma_i) \ln (G - \theta), \quad i = h, w, \tag{3}$$

where $\tau_i$, $\pi_i$, and $\theta$ are the subsistence parameters, $\beta_i > 0$, $\gamma_i > 0$, and $\beta_i + \gamma_i < 1$. The couple chooses its expenditures using a collective approach (Chiappori, 1988) in which they choose Pareto-efficient expenditures on $N_h$, $N_w$, $C_h$, $C_w$, and $G$ to maximise a household objective function that includes and weights their individual preferences:

$$W = \lambda U_h (N_h, C_h, G) + (1 - \lambda) U_w (N_w, C_w, G) \tag{4}$$

subject to a budget constraint, $N_h + N_w + C_h + C_w + G \leq Y$, and where $\lambda$ is a Pareto weight with $0 < \lambda < 1$.

We focus on the expenditures on each person's necessary goods. The derived optimal expenditures are:

$$N_h = \tau_h - \lambda\, \beta_h\, (\tau_h + \tau_w + \pi_h + \pi_w + \theta) + \lambda\, \beta_h\, Y \tag{5a}$$

$$N_w = \tau_w - (1-\lambda)\, \beta_w\, (\tau_h + \tau_w + \pi_h + \pi_w + \theta) + (1-\lambda)\, \beta_w\, Y \tag{5b}$$

**4.2 Empirical model of hardship reporting**

Our data do not *directly* record individual expenditures on necessities. Instead, they include a series of $J$ individually assignable financial hardships, which are related to these expenditures. We assume that each spouse has subjective needs or thresholds regarding elements of his or her own assignable necessities, $M_{i,j}$. Let $\mathbf{M}_h$ and $\mathbf{M}_w$ be vectors that include all the elements of needs. These enter the subsistence parameters of the individual utility functions such that $\tau_h = \tau_h(\mathbf{M}_h)$ and $\tau_w = \tau_w(\mathbf{M}_w)$. We further assume that each spouse reports hardships if expenditures on necessities fall below their needs—that is, he or she reports a hardship, $H_{i,j} = 1$, on the $j^{\text{th}}$ individual good element if $N_i < M_{i,j}$.

To obtain empirical specifications, we specify the components of the expenditure and reporting models to depend on observed and unobserved characteristics as follows:

$$M_{i,j} - \tau_i(\mathbf{M}_i) = -\delta_{i,j} + \boldsymbol{\Delta}_i'\mathbf{X}_i + \mu_i + \varepsilon_{i,j}, \quad i = h, w \text{ and } j = 1, J \tag{6a}$$

$$\tau_h(\mathbf{M}_h) + \tau_w(\mathbf{M}_w) + \pi_h + \pi_w + \theta = \mathbf{K}'\mathbf{S} \tag{6b}$$

$$\lambda = \boldsymbol{\Psi}'\mathbf{R} \tag{6c}$$

where $\mathbf{X}_i$ is a vector of observed variables, $\mathbf{S}$ is a vector containing all the unique elements of $\mathbf{X}_h$ and $\mathbf{X}_w$ and other household characteristics, $\mu_i$ is a person-level random term, and $\varepsilon_{i,j}$ is a

person- and hardship-level random term.

Substituting expressions (6a)-(6c) into the expenditure equations (5a) and (5b) and the hardship reporting conditions yields the resulting reporting specifications:

$$H_{h,j} = 1 \quad \text{if} \quad \boldsymbol{\Delta}_h'\mathbf{X}_h + \beta_h\,(\boldsymbol{\Psi}'\mathbf{R})\,(\mathbf{K}'\mathbf{S}) \;-\; \beta_h\,(\boldsymbol{\Psi}'\mathbf{R})\,Y + \mu_h + \varepsilon_{h,j} \;>\; \delta_{h,j} \tag{7a}$$

$$H_{w,j} = 1 \quad \text{if} \quad \boldsymbol{\Delta}_w'\mathbf{X}_w + \beta_w\,(1 - \boldsymbol{\Psi}'\mathbf{R})\,(\mathbf{K}'\mathbf{S}) \;-\; \beta_w\,(1 - \boldsymbol{\Psi}'\mathbf{R})\,Y + \mu_w + \varepsilon_{w,j} \;>\; \delta_{w,j} \tag{7b}$$

The system is estimated subject to distributional assumptions on the random terms and normalizing restrictions on $\delta_{h,1}$ and $\delta_{w,1}$, the intercepts of $\mathbf{K}'\mathbf{S}$ and $\boldsymbol{\Psi}'\mathbf{R}$, and the variance of $\varepsilon_{i,j}$. Specifically, we assume that $\mu_h$ and $\mu_w$ are jointly normally distributed with means of zero and covariance $\sigma_{hw}$, that each $\varepsilon_{i,j}$ is independently normally distributed with a mean of zero and variance of one, that $\delta_{h,1} = \delta_{w,1} = 0$, that $\kappa_0 = 0$, and that $\Psi_0 = 0.5$. All the other parameters of equations (7a) and (7b) are identified and estimated. Importantly, from our structural model we can identify the contributions of observed characteristics to the Pareto weight, $\lambda = \boldsymbol{\Psi}'\mathbf{R}$, up to a constant and identify the necessity expenditure share parameters, $\beta_h$ and $\beta_w$, from the individual utility functions.

For the sharing rule, the elements of **R** include the ratio of the wife's predicted total personal annual income to that of the sum of each spouse's predicted total personal annual income.[3] Specified in this manner, the predicted income ratio does not directly affect a spouse's financial hardships, but only indirectly via its effect on λ. To capture people's needs, we specify the $\mathbf{X}_i$ vectors to include measures of spouse *i*'s age, education, disability status, physical health, mental health, financial risk-taking, motivation traits, non-English migrant status, Aboriginal and

[3] Alternative measures were also considered for inclusion in the Pareto weight function. See section 6 for a discussion.

Torres Strait Islander (Indigenous) background, subjective financial capability, and objective financial literacy. The **S** vector includes all the husband-specific measures, all the wife-specific measures, the number of children, a rurality indicator, the household's local-level unemployment rate, the SEIFA economic disadvantage index, and an indicator for whether a couple is married. As our model also requires a measure of the household's income, we use the annual measure of the household's total income from all sources and all members. We obtain maximum likelihood estimates of the model parameters using the aML software package (http://www.applied-ml.com).

## 5 Structural model results

Estimates of the hardship reporting models (7a) and (7b) are reported in Table 4. The top panel lists results for the Pareto weight parameters and the necessary expenditure share parameters from the individual preference functions. The bottom panel lists results for the needs measures. The model also included threshold parameters for the specific hardships and variance and covariance parameters for the person-specific error terms.

Consistent with the reduced-form results for wives, the parameter (**Ψ**) on the predicted income share in the Pareto weight of the structural model is negative and insignificant. The predicted income ratio decreases the husband's Pareto weight in household decision-making and increases the wife's Pareto weight. This suggests that having relatively higher predicted income relative to their husbands increases wives' bargaining power within households, though we again note that this association is not significantly different from zero.

The estimates of the necessity expenditure share parameters, $\beta_h$ and $\beta_w$, from the individual utility functions are consistent with theory, as both parameters are significantly

positive. Given that $\beta_h > \beta_w$, husbands place more weight than wives on expenditures for their individually assignable necessities. Other things held constant, this is expected to lead to husbands spending more than wives on their own necessities and placing a lower weight on other types of consumption, which may also include household public goods. The greater weight placed by husbands on personal consumption of necessities is consistent with them experiencing fewer individual hardships compared to wives, which we observe in the household reporting patterns (Table 1).

The bottom panel shows results for the needs parameters. The first two columns list coefficient estimates ($\boldsymbol{\Delta}_i$) and standard errors for the difference between each spouse's need threshold and the subsistence term for expenditures on his or her individually assignable necessities. Other things held constant, higher values of the coefficients are associated with reporting more hardships, which would occur through a larger needs threshold, lower expenditures (from a lower subsistence parameter), or both. Wives' hardships are much more strongly correlated than husbands' hardships with their personal threshold/needs characteristics. Hardships for husbands decrease through these mechanisms as they age, and hardships for husbands increase with impulsivity. Hardships for wives decrease through these mechanisms as they age, through better general- and mental health, better subjective financial capability, and impulsivity. Hardships for wives increase through disability status and greater achievement motivation. Most of these results fit with expectations, except perhaps for wives' impulsivity and achievement motivation. One explanation for the latter result may be that women with greater achievement motivation may have higher perceptions of their needs for expenditures on necessities.

The next two columns report coefficients (**K**) and standard errors for characteristics that enter the sum of the subsistence parameters. Other things held constant, higher values of the coefficients lead to more hardships by increasing the value of the total subsistence amount and reducing expenditures on individually assignable necessities. Husbands' disability and achievement motivation, and the number of children increase hardships through this mechanism. Wives' age, and formal marriage and both spouses' subjective financial capabilities are estimated to reduce hardships. All the results for the contributions to the total subsistence amount fit with expectations.

Overall, the structural model results are very similar to the results of the reduced-form model. Importantly, this strengthens support for the structural model as it suggests that the structural results are not an artefact of the L.E.S. specification.

## 6 Sensitivity analyses

Although the final reported results included only the predicted income ratio as part of the Pareto weight function, we also experimented with alternative measures as elements of **R**. These include several wife-to-husband ratio measures, namely ratios of their non-labour incomes, subjective financial capabilities, objective financial literacies, educational attainments, and ages. As institutional variables, we also used a marriage dummy and the Greater Capital City (GCCSA) sex ratio. As cultural variables, we included non-English migrant status and Aboriginal and Torres Strait Islander background as part of **R**. We also experimented with including in **R** average standardised measures of the couple's non-labour income, age, education, subjective financial capability, and objective financial literacy. None of these measures were significant predictors of the Pareto weight.

We estimated our main models using a sample that included both formally married and de facto married couples. Our estimates are similar when we restrict the sample to just formally married couples, although fewer coefficients remain significant. As an additional specification check, in addition to estimating the main models with three assignable hardships (pawning or selling something, going without meals, and asking financial help from friends or family), we also re-estimated these models after including having asked for help from welfare/community organisations as a fourth hardship outcome. The reduced-form and structural model results from these estimations are very similar to the results reported in Tables 3 and 4.

## 7 Conclusion

Framed within a collective household framework, this paper investigates the intra-household distribution of individually assignable financial hardships among lower- to middle-income Australian couples through descriptive, multivariate reduced-form, and multivariate structural analyses.

The descriptive analyses revealed that wives report higher incidences of financial hardship as compared to husbands. One explanation for this could be attributed to differences in bargaining power between spouses. However, there is little evidence of a bargaining power relationship, as the association between the predicted income ratio—as bargaining power measure—and financial hardships is not significant. Another explanation for wives experiencing more hardships than husbands could be due to fundamental differences in preferences between women and men. Results from the structural model's necessity expenditure share parameters indeed highlight that husbands place more weight than wives on their own necessary expenditures, which is in turn consistent with the descriptive evidence of fewer

hardships among husbands compared to wives. Wives' weaker individual preferences for their own necessary expenditures could reflect stronger preferences for expenditures on other private goods for themselves but they might also reflect stronger preferences for public goods for the household.

Notwithstanding the absence of evidence supporting a bargaining effect, the results highlighted other important correlates of financial hardships among Australian couples. For husbands, disability and impulsivity are related to greater hardships, whereas for wives, disability and achievement motivation are related to greater hardships. Having fewer children and being married (as opposed to being in a cohabiting relationship) are significantly associated with fewer financial hardships. The results also point to the potential importance of financial capabilities in lowering hardships; greater levels of subjective financial capabilities are related to lower experiences of hardships for both husbands and wives.

The results also indicate that some characteristics may uniquely or more strongly contribute to greater hardships for wives. Poor physical and mental health among wives appear to contribute to their experiences of hardships, but not their husbands' experiences. This suggests that women's health supports might be especially valuable in both improving health and reducing wives' financial hardships. Better subjective financial capability is estimated to reduce financial hardships for husbands and wives. However, wives appear to benefit more than husbands, suggesting that wives' financial capability might be a particular focus of policy. Finally, the moderate degree of nonconcordance in hardships and the higher overall incidence for wives suggests that governments and social service agencies should consider distributing in-kind aid to individuals, rather than collectively, where possible.

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**Table 1. Couples' Reports of Financial Hardships**

| Financial hardship | Husband reports | Wife reports | Both report | Only one reports | Husband/ wife rank correlation |
|---|---|---|---|---|---|
| *Entire sample* | | | | | |
| Any hardship | 11.4% | 12.9% | 6.9% | 10.6% | 0.51 |
| Pawned or sold something | 4.4% | 5.8% | 2.2% | 5.8% | 0.40 |
| Went without meals | 2.0% | 2.4% | 0.8% | 2.7% | 0.36 |
| Asked financial help from friends or family | 10.0% | 10.4% | 5.7% | 9.0% | 0.51 |
| Could not pay utilities | 9.9% | 11.6% | 5.9% | 9.6% | 0.50 |
| Could not pay mortgage or rent | 4.5% | 4.8% | 2.1% | 5.0% | 0.43 |
| Asked help from welfare organisations | 2.4% | 2.8% | 1.2% | 2.9% | 0.43 |
| *Household income ≥ $100,000* | | | | | |
| Any hardship | 7.8% | 7.5% | 3.1% | 8.9% | 0.36 |
| Pawned or sold something | 2.0% | 3.2% | 0.4% | 4.3% | 0.15 |
| Went without meals | 0.9% | 0.9% | 0.3% | 1.2% | 0.34 |
| Asked financial help from friends or family | 6.9% | 5.6% | 2.5% | 7.5% | 0.36 |
| Could not pay utilities | 6.0% | 8.0% | 3.5% | 7.0% | 0.47 |
| Could not pay mortgage or rent | 3.0% | 3.6% | 1.5% | 3.6% | 0.44 |
| Asked help from welfare organisations | 0.6% | 0.6% | 0.1% | 0.9% | 0.22 |
| *Household income < $100,000* | | | | | |
| Any hardship | 14.3% | 17.1% | 9.8% | 11.8% | 0.56 |
| Pawned or sold something | 6.3% | 7.8% | 3.6% | 7.0% | 0.47 |
| Went without meals | 2.8% | 3.5% | 1.2% | 3.9% | 0.36 |
| Asked financial help from friends or family | 12.4% | 14.2% | 8.2% | 10.2% | 0.56 |
| Could not pay utilities | 13.0% | 14.3% | 7.8% | 11.7% | 0.51 |
| Could not pay mortgage or rent | 5.7% | 5.8% | 2.6% | 6.2% | 0.43 |
| Asked help from welfare organisations | 3.8% | 4.6% | 2.0% | 4.5% | 0.45 |

Notes: Estimates of hardships for 2,058 couples with annual household incomes below $100,000 from Wave 16 of the HILDA Survey. For each hardship category, a $\chi^2$ test suggests significant differences in hardship reporting between husbands and wives in all samples (all $p < 0.001$).

**Table 2. Summary statistics of explanatory variables**

| | Husbands | Wives |
|---|---|---|
| *Individual-specific variables* | | |
| Age | 51.03 (19.30) | 48.55 (18.89) |
| Years of education | 12.71 (1.94) | 12.82 (2.03) |
| Disability | 0.32 (0.47) | 0.30 (0.46) |
| General health (SF-36) | 64.79 (20.61) | 66.30 (20.94) |
| Mental health (SF-36) | 75.51 (16.66) | 73.61 (17.22) |
| Predicted total personal income | 44,361.77 (17,224.14) | 21,370.10 (9,988.57) |
| Subjective financial capability | 15.46 (3.83) | 15.08 (3.95) |
| Objective financial literacy | 4.24 (0.94) | 3.76 (1.29) |
| Non-English-speaking migrant | 0.12 (0.33) | 0.13 (0.34) |
| Aboriginal or Torres Strait Islander | 0.02 (0.15) | 0.02 (0.16) |
| Financial risk-taking | 1.66 (0.70) | 1.44 (0.60) |
| Motivation traits: Future orientation | 4.68 (1.41) | 4.84 (1.37) |
| Motivation traits: Impulsive | 3.11 (1.28) | 3.05 (1.27) |
| Motivation traits: Achievement motivation | 5.07 (1.07) | 5.05 (1.06) |
| *Couple-level variables* | | |
| Children | 0.72 (1.08) | |
| Married | 0.72 (0.45) | |
| Household income | 65,541.24 (21,759.55) | |
| Local unemployment rate | 5.44 (0.75) | |
| SEIFA index | 4.90 (2.71) | |
| Rural | 0.42 (0.49) | |
| Predicted income ratio† | -0.17 (0.11) | |

Notes: Table reports means (standard deviations). Statistics reported for couples with annual household incomes below $100,000.

† Measured by the standardised ratio of the wife's predicted income to the husband's predicted income and centered by subtracting 0.5, which allows the variable to range from -0.5 to 0.5. Predicted income variables are derived from regressions of each spouse's personal annual income on a set of covariates, the results of which are shown in Table A1.

**Table 3. Reduced-form MIMIC estimates of couple financial hardships**

| | Financial hardships | |
|---|---|---|
| | Husband | Wife |
| Predicted total income ratio | 0.3335 | -0.5484 |
| | (1.1889) | (0.9955) |
| Household income | -0.1393*** | -0.1081*** |
| | (0.0348) | (0.0283) |
| Husband age | -0.0183 | 0.0040 |
| | (0.0122) | (0.0098) |
| Wife age | -0.0272** | -0.0459*** |
| | (0.0127) | (0.0104) |
| Husband education | 0.0254 | -0.0097 |
| | (0.0433) | (0.0361) |
| Wife education | -0.0135 | 0.0419 |
| | (0.0518) | (0.0428) |
| Husband disability | 0.3094* | 0.3367** |
| | (0.1618) | (0.1339) |
| Wife disability | 0.2381 | 0.3798*** |
| | (0.1665) | (0.1365) |
| Husband general health | -0.0072* | -0.0020 |
| | (0.0038) | (0.0032) |
| Wife general health | -0.0063* | -0.0104*** |
| | (0.0037) | (0.0030) |
| Husband mental health | -0.0126*** | -0.0041 |
| | (0.0042) | (0.0035) |
| Wife mental health | -0.0075* | -0.0157*** |
| | (0.0043) | (0.0035) |
| Husband Non-English-speaking migrant | -0.0081 | -0.3366 |
| | (0.2682) | (0.2325) |
| Wife non-English-speaking migrant | -0.2381 | -0.4060* |
| | (0.2892) | (0.2407) |
| Husband Aboriginal or Torres Strait Islander | 0.1106 | 0.1473 |
| | (0.2954) | (0.2520) |
| Wife Aboriginal or Torres Strait Islander | 0.4955* | 0.3302 |
| | (0.2931) | (0.2495) |
| Husband subjective financial capability | -0.0785*** | -0.0581*** |
| | (0.0180) | (0.0148) |
| Wife subjective financial capability | -0.0419*** | -0.0777*** |
| | (0.0170) | (0.0142) |
| Husband objective financial literacy | 0.0045 | -0.0568 |
| | (0.0652) | (0.0537) |
| Wife objective financial literacy | -0.0355 | -0.0005 |

| | Financial hardships | |
|---|---|---|
| | Husband | Wife |
| | (0.0492) | (0.0411) |
| Husband risk-taking | -0.0101 | -0.0296 |
| | (0.0862) | (0.0721) |
| Wife risk-taking | -0.1322 | 0.0222 |
| | (0.1071) | (0.0866) |
| Husband future orientation | -0.0348 | -0.0583 |
| | (0.0519) | (0.0433) |
| Wife future orientation | -0.0412 | -0.0588 |
| | (0.0536) | (0.0443) |
| Husband impulsivity | 0.0721 | -0.0425 |
| | (0.0563) | (0.0465) |
| Wife impulsivity | -0.0168 | -0.0987** |
| | (0.0565) | (0.0471) |
| Husband achievement motivation | 0.2800*** | 0.1272** |
| | (0.0659) | (0.0528) |
| Wife achievement motivation | 0.0724 | 0.2406*** |
| | (0.0631) | (0.0537) |
| Local unemployment rate | 0.0482 | -0.0287 |
| | (0.0816) | (0.0670) |
| SEIFA index | 0.0174 | -0.0367 |
| | (0.0270) | (0.0225) |
| Rural | 0.0951 | -0.0376 |
| | (0.1319) | (0.1082) |
| Number of children | 0.3078*** | 0.1787*** |
| | (0.0694) | (0.0570) |
| Married | -0.4463*** | -0.2024* |
| | (0.1480) | (0.1211) |
| var($v_h$) | 1.3381*** | |
| | (0.1108) | |
| var($v_w$) | 1.0919*** | |
| | (0.0869) | |
| corr($v_h$, $v_w$) | 0.9004*** | |
| | (0.0434) | |
| Log-likelihood | -2,070.25 | |

Notes: Coefficients and standard errors from a reduced-form MIMIC model of financial hardships estimated using Wave 16 data on couples from the HILDA Survey. Standard errors are in parentheses. *** p < 0.01, ** p < 0.05,* p < 0.10.

**Table 4. Coefficient Estimates from Structural Hardship Reporting Model**

*Panel A: Sharing rule and personal necessity expenditure share parameters*

| | |
|---|---|
| Predicted income ratio | -0.0147 |
| | (0.0556) |
| $\beta_h$ | 0.2925*** |
| | (0.0660) |
| $\beta_w$ | 0.1975*** |
| | (0.0872) |

| *Panel B: Needs Parameters* | **Δ** (Husband) | **Δ** (Wife) | **K** (Husband) | **K** (Wife) |
|---|---|---|---|---|
| Age | -0.0243* | -0.0270** | 0.0361 | -0.1833* |
| | (0.0147) | (0.0114) | (0.1007) | (0.0974) |
| Years of Education | 0.0442 | 0.0309 | -0.1067 | -0.0483 |
| | (0.0545) | (0.0381) | (0.3503) | (0.2825) |
| Disability | -0.1910 | 0.2597* | 3.4002** | 1.5088 |
| | (0.2200) | (0.1333) | (1.6471) | (1.1843) |
| General health | -0.0042 | -0.0065** | -0.0201 | -0.0420 |
| | (0.0046) | (0.0030) | (0.0332) | (0.0268) |
| Mental health | -0.0070 | -0.0114*** | -0.0377 | -0.0492 |
| | (0.0051) | (0.0034) | (0.0368) | (0.0299) |
| Non-English-speaking migrant | 0.4364 | -0.1369 | -3.2129 | -1.8732 |
| | (0.3507) | (0.2395) | (2.3830) | (1.8333) |
| Aboriginal or Torres Strait Islander | -0.0781 | -0.0176 | 1.3491 | 3.3964 |
| | (0.3470) | (0.2368) | (2.3830) | (2.0931) |
| Subjective financial capability | 0.0093 | -0.0485*** | -0.5939*** | -0.2874** |
| | (0.0287) | (0.0152) | (0.2223) | (0.1322) |
| Objective financial literacy | 0.0985 | 0.0218 | -0.6112 | -0.2409 |
| | (0.0811) | (0.0401) | (0.5812) | (0.3384) |
| Risk-taking | 0.0360 | 0.1020 | -0.3136 | -0.8585 |
| | (0.1038) | (0.0873) | (0.7427) | (0.7427) |
| Future orientation | 0.0528 | -0.0335 | -0.5963 | -0.2740 |
| | (0.0663) | (0.0440) | (0.4754) | (0.3703) |
| Impulsivity | 0.1382** | -0.0886* | -0.4439 | -0.1090 |
| | (0.0685) | (0.0458) | (0.4877) | (0.3854) |
| Achievement motivation | 0.0985 | 0.1915*** | 1.2617** | 0.4929 |
| | (0.0868) | (0.0530) | (0.6331) | (0.4431) |
| Local unemployment rate | | | 0.1474 | |
| | | | (0.5179) | |
| SEIFA index | | | -0.0344 | |
| | | | (0.1716) | |

| | | |
|---|---|---|
| Rural | | 0.3211 |
| | | (0.8437) |
| Number of children | | 2.0268*** |
| | | (0.4911) |
| Married | | -2.7222*** |
| | | (1.1263) |
| $\mu_h$ | 1.3352*** | |
| | (0.1108) | |
| $\mu_w$ | 1.0995*** | |
| | (0.0872) | |
| $\sigma_{hw}$ | 0.8933*** | |
| | (0.0434) | |
| Log-likelihood | -2073.80 | |

Notes: Coefficients and standard errors from structural model estimated using Wave 16 data on couples from the HILDA Survey; standard errors are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table A1. Income regression results used to estimate predicted income**

| | Total annual personal income | |
|---|---|---|
| | Husband | Wife |
| Husband age | 0.1870*** | -0.0514 |
| | (0.0341) | (0.0809) |
| Husband age squared | -0.0034*** | 0.0003 |
| | (0.0007) | (0.0016) |
| Husband age cubed | 0.0000*** | 0.0000 |
| | (0.0000) | (0.0000) |
| Wife age | -0.0225 | 0.2644*** |
| | (0.0334) | (0.0919) |
| Wife age squared | 0.0006 | -0.0049*** |
| | (0.0007) | (0.0019) |
| Wife age cubed | -0.0000 | 0.0000** |
| | (0.0000) | (0.0000) |
| Husband education (Comparison: Year 11 and below) | | |
| Year 12 | 0.1484*** | -0.0097 |
| | (0.0471) | (0.1030) |
| Certificate III or IV | 0.1307*** | -0.0655 |
| | (0.0353) | (0.0866) |
| Advanced Diploma or Diploma | 0.2273*** | -0.2032 |
| | (0.0535) | (0.1326) |
| Bachelor or Honours | 0.3700*** | -0.1427 |
| | (0.0483) | (0.1123) |
| Graduate Diploma or Certificate | 0.4025*** | -0.4093** |
| | (0.0654) | (0.1760) |
| Masters or Doctorate | 0.4767*** | -0.2971* |
| | (0.0652) | (0.1668) |
| Wife education (Comparison: Year 11 and below) | | |
| Year 12 | -0.0496 | 0.1910 |
| | (0.0427) | (0.1223) |
| Certificate III or IV | -0.0250 | 0.3914*** |
| | (0.0386) | (0.1071) |
| Advanced Diploma or Diploma | 0.0197 | 0.4593*** |
| | (0.0423) | (0.1275) |
| Bachelor or Honours | -0.0424 | 0.7929*** |
| | (0.0461) | (0.1174) |
| Graduate Diploma or Certificate | -0.0996 | 0.9834*** |
| | (0.0645) | (0.1352) |
| Masters or Doctorate | -0.0665 | 1.1713*** |
| | (0.0768) | (0.1464) |
| Husband disability | -0.1441*** | -0.0215 |

| | Total annual personal income | |
|---|---|---|
| | Husband | Wife |
| | (0.0386) | (0.0832) |
| Wife disability | 0.0214 | -0.1402 |
| | (0.0380) | (0.0919) |
| Husband general health | 0.0019** | 0.0001 |
| | (0.0009) | (0.0020) |
| Wife general health | 0.0008 | -0.0013 |
| | (0.0008) | (0.0022) |
| Husband mental health | 0.0030*** | -0.0028 |
| | (0.0010) | (0.0021) |
| Wife mental health | 0.0011 | 0.0042 |
| | (0.0009) | (0.0026) |
| Husband Non-English-speaking migrant | -0.2435*** | -0.0296 |
| | (0.0590) | (0.1437) |
| Wife non-English-speaking migrant | -0.0412 | -0.4785*** |
| | (0.0524) | (0.1489) |
| Husband Aboriginal or Torres Strait Islander | -0.1690** | -0.0552 |
| | (0.0770) | (0.1825) |
| Wife Aboriginal or Torres Strait Islander | -0.0473 | 0.2717** |
| | (0.0791) | (0.1177) |
| Number of children (Comparison: None) | | |
| 1 child | 0.0581 | -0.1309 |
| | (0.0360) | (0.0947) |
| 2 children | 0.0534 | -0.2394*** |
| | (0.0417) | (0.0881) |
| 3 children | 0.1533*** | -0.3653*** |
| | (0.0480) | (0.1300) |
| 4 or more children | 0.1320** | -0.3865 |
| | (0.0633) | (0.2741) |
| SEIFA index (Comparison: 1st decile) | | |
| 2nd decile | -0.0271 | -0.0575 |
| | (0.0547) | (0.1284) |
| 3rd decile | 0.0812* | -0.1022 |
| | (0.0484) | (0.1273) |
| 4th decile | 0.0926* | -0.0249 |
| | (0.0531) | (0.1285) |
| 5th decile | 0.1380*** | -0.1191 |
| | (0.0441) | (0.1354) |
| 6th decile | 0.1092** | -0.0369 |
| | (0.0512) | (0.1314) |
| 7th decile | 0.1801*** | 0.0289 |
| | (0.0546) | (0.1301) |
| 8th decile | 0.1823*** | 0.0532 |

| | Total annual personal income | |
|---|---|---|
| | Husband | Wife |
| | (0.0514) | (0.1390) |
| 9th decile | 0.2040*** | 0.0991 |
| | (0.0582) | (0.1299) |
| 10th decile | 0.3063*** | -0.0275 |
| | (0.0617) | (0.1571) |
| Region of residence (Comparison: Greater Sydney) | | |
| Rest of New South Wales | -0.0103 | 0.0289 |
| | (0.0466) | (0.1200) |
| Greater Melbourne | -0.0148 | 0.0193 |
| | (0.0482) | (0.1072) |
| Rest of Victoria | -0.0889 | -0.0902 |
| | (0.0570) | (0.1473) |
| Greater Brisbane | 0.0122 | 0.0224 |
| | (0.0455) | (0.1249) |
| Rest of Queensland | -0.1007** | -0.1313 |
| | (0.0505) | (0.1310) |
| Greater Adelaide | -0.0464 | 0.0258 |
| | (0.0599) | (0.1370) |
| Rest of South Australia | -0.1543* | -0.0180 |
| | (0.0827) | (0.2054) |
| Greater Perth | 0.0753 | -0.2311 |
| | (0.0570) | (0.1587) |
| Rest of Western Australia | 0.0095 | -0.2130 |
| | (0.1354) | (0.2793) |
| Tasmania | -0.2561** | 0.1235 |
| | (0.1054) | (0.1598) |
| Northern Territory | 0.0999 | -0.1735 |
| | (0.1299) | (0.4373) |
| Observations | 3,668 | 3,668 |
| F-statistic | 33.2*** | 5.5*** |
| $R^2$ | 0.2460 | 0.0583 |

Notes: Dependent variable is the log of total personal annual income. Standard errors are in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.10.