

**Understanding the Factors Associated with Financial Stress
in Australian Households**

**Robert Breunig
and
Deborah Cobb-Clark**

**Social Policy Evaluation Analysis and Research Centre
The Australian National University**

December 2004

1. Introduction

The objective of this project is to address the following questions: How do household characteristics – for example household size, the age structure of children, disability status, and labour market activity – affect a household's propensity to report experiencing financial stress? How do these relationships change as one moves up the income-scale (say from low to middle to high income)? How sensitive are these results to the way in which we measure financial stress? Answers to these questions are important in identifying vulnerable groups within Australian society and will be informative about any potential changes in payments within the social security system.

The outline of the report is as follows. In Section 2 we discuss the HILDA data used in this project. Following that, the incidence of financial stress is compared across family types and income quintiles. Several different measures of financial stress will be considered. In Section 4 we use multivariate regression techniques to assess the way in which the incidence of financial stress varies across different household characteristics. Equivalence scales derived from our financial stress measures are discussed in Section 5, while Section 6 discusses some tentative policy conclusions.

2. The Data Issues

The data come from the second wave of Household Income and Labour Dynamics in Australia (HILDA) Survey.¹ The HILDA Survey is a nationally representative panel survey of Australian households. After completing a personal questionnaire (PQ), household members over the age of 15 were also asked to fill out a self-completed questionnaire (SCQ) that asked about a range of stressful financial events. Specifically, individuals were asked "Since January of 2002 did any of the following happen to you because of a shortage of money?" Possible responses included 1) an inability to pay utility bills on time; 2) an inability to pay the mortgage or rent on time; 3) pawning or selling something; 4) asking for financial help from family or friends; 5) asking for help from welfare or community organizations; 6) an inability to heat the home; and 7) missing meals.

We use this information to create indicator (0,1) variables for each form of stress as well as indicators for experiencing at least one form of financial stress. Following Bray (2001) we also consider two summary measures of financial stress that essentially correspond to financial hardship (missing meals, pawning something, inability to heat the home and applying for welfare) and cash flow problems (inability to pay rent/mortgage, inability to pay utilities, and borrowing from friends).

Our sample consists of individuals in single-family households who are living in nuclear families.² Approximately 92 per cent of individuals identified in HILDA live in such families. We classify these families into three types: couple headed, lone

¹ See Watson and Wooden (2002) for more details.

² In other words, families which include other non-related or related individuals have been excluded. Thus, the families in the sample include parents and children. The vast majority of Australian families are nuclear families.

parent, and single individuals. Our estimation sample includes 3290 couples, 515 lone parent families, and 1734 single individuals.³

3. The Incidence of Financial Stress in Australian Families

By Family Type:

We begin by considering how the propensity to experience financial stress differs in couple-headed, lone parent, and single-headed households.⁴ Previous work demonstrates that partners in couple-headed households often disagree about whether or not the household has in fact experienced financial stress (Breunig, et al., 2004). Consequently, we consider two alternative household-based methods for measuring financial stress. In one case, couple-headed families are considered to be financially stressed whenever one partner reports stress, in the other couples are considered to be stressed only when both partners report the stress. Both of these measures are household-based, i.e., the family is the unit of analysis. We also consider a third individual-based measure of financial stress in which the individual is the unit of analysis.

The incidence of financial stress across family types is shown in Tables 1 – 3. These results show that household-based measures of financial stress (Tables 1 and 2) depend critically on the way in which financial stress amongst couples is measured. Fully 9.8 per cent of couples have experienced financial hardship and 25.1 per cent have experienced cash flow problems when stress is based on the report of either partner. The numbers fall to 2.9 per cent and 10.9 per cent, respectively when we require both partners to report the stress. As couple-headed households are a large fraction of the total population, these differences also have important implications for the measurement of the overall incidence of financial stress. In total, 30.6 per cent of Australian families are measured as having experienced some form of financial stress in the previous 12 months when we use the first definition, but only 21.6 per cent are estimated to have experienced stress when we apply the second definition. Moreover, the relative stress in couple-headed versus single-headed households depends very much on the method we use to estimate financial stress in couples. Using the first method, it appears that couples and singles are approximately equally likely to experience financial stress. With method 2, couples are estimated to be much less likely to experience stress than their single counterparts. In short, the way in which we deal with disagreement between partners in reported financial stress has important implications for the measurement of financial stress at a family level (see Breunig, et al, 2004 for more information).

Table 3 takes a different approach and defines financial stress to be an individual rather than family experience. Here all those family members (including children

³ There are 6779 nuclear families living in single-family households identified in HILDA. We eliminated 36 lone parent families in which the parent could not be identified and a further 25 where the parent did not respond to the survey. We also eliminated couples in which the partner could not be identified (41 observations) and in which both partners did not respond to the survey (391 observations). Same sex couples (27 observations) were also eliminated. We eliminated a further 700 families in which at least one partner did not respond to the SCQ containing the financial stress questions. A further 30 households were deleted because they: 1) reported negative income (14 observations); 2) were of the wrong family type (6 observations); or 3) had household weight equal to zero (10 observations).

⁴ All estimates are weighted using the sample weights provided in HILDA.

over the age of 15) responding to the financial stress questions in HILDA's SCQ are included in the calculation.⁵ Rather than one observation per family there are potentially many and this will imply that the results are generally weighted towards the experiences of individuals in large families. The incidence of financial stress amongst individuals is estimated to be slightly higher than the household-based estimates derived using method 2 above.

Overall, these results suggest the following conclusions:

- Lone parent families are substantially much more likely than other families to experience financial stress. Their incidence of financial stress is generally 2 – 3 times as high as that of couple-headed families;
- Couple-headed families are the least likely to experience all forms of financial stress, while single individuals have stress levels between those of couples and lone parents. The exception is that single individuals are the most likely to report missing out on meals as a result of financial constraints.
- Across all family types, the inability to pay the utility bills is the most common individual form of financial stress suggesting that Australian families often delay paying their utility bills in an effort to make ends meet.
- An inability to heat the home is the least common form of financial stress.
- Finally, families are more likely to experience difficulties managing their cash flow than financial hardship. Overall, 28.0 per cent of families reported difficulties with cash flow, while 13.0 per cent reported experiencing financial hardship (see Table 1).

By Income Quintile:

While the above analysis assesses how financial stress varies with family type, it is also interesting to consider how financial stress varies with household income. Here we calculate each household's equivalent income level using the OECD equivalence scale. These results are presented by income quintiles in Tables 4 – 6 using the same three methods described above.

Nor surprisingly, financial stress is closely related to household income. On average, 40.3 per cent of the Australian families in the bottom income quintile (the poorest 20 per cent) experience some form of financial stress (see Table 4). Fully one in three (35.6 per cent) experienced cash flow problems in the previous 12 months, while one in five (22.8 per cent) experienced financial hardship. Financial stress is much less common in the upper income quintile, although despite having high income levels 12.8 per cent of these households experienced cash flow problems while 3.9 per cent experienced financial hardship.

It is interesting that while the incidence of financial hardship declines relatively quickly as income increases, cash flow problems continue to be pervasive even at relatively high-income levels. The incidence of cash flow problems (33.6 per cent) is only slightly lower in the middle-income quintile than in the bottom income quintile (35.6 per cent). Consequently, the ratio of cash flow problems to financial hardship is 1.6 in the bottom income quintile and 3.3 in the top income quintile.

⁵ The previous calculations are based on one response per household.

As above, levels of financial stress are lower when we use method 2 to calculate household-based stress (see Table 5) or when we calculate individual-level financial stress (see Table 6). It remains the case, however, that financial hardship disappears more quickly as income increases, while cash flow difficulties are relatively more pervasive across the income distribution.

4. The Factors Related to Financial Hardship and Cash Flow Problems

In this section we consider the way in which financial stress is related to both the needs and the resources of Australian families. To this end, we estimate a series of multivariate regression models which allow us to simultaneously consider a number of factors which are likely to be related to a family's propensity to report financial stress.⁶ Our focus will be on our two summary measures of financial stress: 1) financial hardship and 2) cash flow problems.⁷ We estimate four alternative models. Model 1 controls only for equivalent income and family type. In addition to these factors, model 2 also controls for the other financial resources of families, while model 3 adds additional detail about the demographic composition of households. Finally, model 4 considers all these factors along with information on families' disability status, unemployment status, average age, geographic location, etc. Family-level estimates of financial stress using method 1 will be discussed in the body of the report, while estimates from the other two methods will be given in the Appendix.

Financial Hardship

Results from our four models of financial hardship are presented in Table 7. Families who report missing meals, being unable to heat their homes, applying for welfare or pawning household goods are considered to have experienced financial hardship.

As before, the incidence of financial hardship declines as equivalent income levels increase.⁸ In particular, an increase of \$10,000 in a family's equivalent household income is associated with a reduction of between 3 to 4 per cent in the propensity to experience financial hardship.⁹ This effect is relatively constant across the various models we consider. It is interesting that although we have controlled for equivalent income levels – rather than actual income levels – the demographic composition of the household is still associated with the propensity to experience financial stress. Although the equivalent income measure also takes into account family composition, it does not completely capture the variation in financial stress across different family types.

Specifically, relative to singles (the omitted category) lone parents are 6.7 percentage points more likely to experience financial hardship (see model 1, Table 7). This difference was 9.2 percentage points (see Table 1) when we did not control for equivalent income. Thus, income differences explain about one third of the difference in the likelihood that lone parents and single individuals will experience financial

⁶ In particular, given the discrete (0,1) nature of our dependent variable we use a probit regression model.

⁷ Results for any form of financial stress – which is a combination of both financial hardship and cash flow problems – are presented in the appendix.

⁸ See also Appendix tables A1 and A2.

⁹ Equivalent household income is measured in \$1000s. Therefore, to calculate the effect of a \$10,000 increase in income we multiply the estimated coefficient by 10.

stress. Couples are 3.3 percentage points less likely to experience financial hardship than are their single counterparts. This is in comparison to an unconditional difference of 5.9 percentage points (see Table 1).

Taking into account the other financial resources that Australian families have alters the relative position of different types of families. Specifically in model 2 we control for whether the household: 1) owns its home; 2) is currently buying its home; or 3) is renting (the omitted category). Equity in the family home may provide a source of financial resources that families can draw on in cases of negative financial events thus reducing the propensity to experience financial hardship. Moreover, we also consider the family's overall net worth position since other financial assets may also protect the family from experiencing financial hardship.¹⁰ These results indicate that families who own their homes outright or who are paying off mortgages are significantly less likely to experience financial hardship. Moreover, higher levels of net worth are also associated with less financial hardship. Not surprisingly, assets do appear to protect families from the difficulties associated with financial stress. Controlling for assets reduces the disparity between different family types.

Model 3 considers the composition of families in more detail. In particular, we differentiate between married and de facto couples and control for the age structure of children in the household as well as the presence of non-resident children attached to the household. De facto couples are much more likely than married couples (22.5 percentage points) to experience financial hardship.¹¹ At the same time, there is little effect of the age structure of children or the presence of non-resident children on families' propensity to experience financial hardship.¹²

Model 4 is a very detailed model that accounts for the demographic structure and assets of families as well as several other factors that are likely to be related to financial hardship. Overall this detailed model suggests the following:

- Lone parents are only slightly more likely than single individuals to experience financial hardship though this effect is only significant at the 10 per cent level. There is no significant difference in the financial hardship of couples and single individuals. Taken together these results suggest that differences between the extent to which different types of families experience financial hardship can be completely explained by a detailed model of the characteristics of those families;
- Assets continue to have a substantial effect of the propensity to experience financial hardship;
- Although financial hardship is not significantly related to the age structure of resident children, non-resident children increase the probability that the household will experience financial hardship;

¹⁰ Net worth is highly skewed and often negative leading us to use an inverse hyperbolic sine transformation of net worth. The consequence is that it is not possible to interpret the coefficient on this factor, although the significance level of this factor is of interest.

¹¹ This variable is an interaction term (couple family*de facto) and provides a test of whether or not there are significant differences between married and de facto couples.

¹² Only children in the 5 – 9 year old category are associated with significantly higher levels of financial hardship though the effect (1.8 percentage points) is relatively small.

- Families in which at least one adult is unemployed or disabled are significantly more likely to experience financial hardship;
- Financial hardship is not significantly related to either immigration status or geographic location once other factors are taken into account.

Cash Flow Problems

Similar estimates of the factors related to cash flow problems are reported in Table 8. Cash flow problems include an inability to pay the utilities or rent/mortgage on time or the need to borrow money from friends to make ends meet.

Families with higher income levels have fewer cash flow problems. Specifically, an increase of \$10,000 in a family's equivalent income is associated with a reduction in the probability of experiencing cash flow problems by between 4 to 5 per cent. As before, the effect of increased income is relatively constant across the various models that we consider.

There is no difference in the extent to which couples and single individuals experience cash flow problems once we control for equivalent income. At the same time, lone parents are much more likely to experience cash flow difficulties (see model 1). Controlling for income, lone parent families are 17.6 percentage points more likely than single individuals to experience difficulties with cash flow. When we do not control for income this difference is 18.9 percentage points (see Table 1) suggesting that income itself plays little role in the difficulties (relative to other families) that lone parents have in avoiding cash flow problems.

Home owners are substantially (25.3 percentage points) less likely to experience cash flow problems, while cash flow problems also occur less frequently amongst families that are currently in the process of buying their home. As with financial hardship, higher levels of net worth protect families from experiencing cash flow problems. Controlling for assets suggests that couples are more likely (6.9 percentage points) to experience their cash flow problems than are single individuals. In other words, the lack of a significant difference between couples and singles that was observed in model 1 stems from the high asset levels of couples. Once couples are compared to single individuals with the same asset levels it becomes apparent that couple-headed families are more likely to experience difficulties with cash flow.

The age structure of resident children and the presence of non-resident children is important in understanding a family's propensity to experience cash flow problems. Families with children between the ages of 0 and 4 are 7.4 percentage points more likely to have cash flow problems. Children between the ages of 5 and 9 increase the incidence of cash flow problems by 4.2 percentage points, while children between the ages of 10 – 14 are associated with 2.3 percentage points more cash flow problems.

In model 4 we take into account both the demographic structure and assets of households along with several other factors that might logically be related to a family's cash flow difficulties. This model suggests the following:

- Lone parents are 9.8 percentage points more likely than single individuals to experience cash flow difficulties, although there is no significant difference between couples' and singles' propensity to have cash flow problems;

- De facto couples experience significantly more cash flow problems than married couples;
- Nonresident children increase a family’s propensity to experience cash flow problems by 10.0 percentage points, although – as with financial hardship – the age structure of resident children is relatively unimportant in understanding the cash flow experiences of families;
- Equity in the family home or other forms of assets reduces the extent to which families experience difficulties with cash flow;
- Unemployed or disabled family members increase the family’s propensity to experience cash flow problems by 7.5 and 6.8 percentage points respectively;
- Finally, there is little effect of characteristics such as immigration status and geographic location on the propensity to experience cash flow difficulties.

5. Equivalence Scales

Introduction:

Equivalence scales indicate the amount of expenditure that a household with a given demographic composition needs to achieve the same “welfare level” as a reference household with a demographic composition. In particular, equivalence scales answer questions like: how much would a couple with one child have to spend in order to achieve the same welfare level as a childless couple? Answers to this (and similar questions) are important for a myriad of public policy decisions about social welfare programs – like income-support, child benefits, rent assistance, progressive taxation, etc. – which seek to redistribute income from one segment of the population to another.¹³

If we have a model of utility for households (indexed by h) of size s with income y

$$(1) \quad V_{hs} = g(y_h, s_h)$$

we can solve for the equivalence scales by first estimating the model on all households and then solving for average utility of a household of size r by

$$(2) \quad \hat{V}_{\cdot r} = \hat{g}(\bar{y}_{\cdot r}, r).$$

The notation $\bar{y}_{\cdot r}$ indicates the average income over households of size r and \hat{g} indicates the estimated function. The equivalence scale comes from solving the problem

$$(3) \quad \hat{V}_{\cdot r} = \hat{g}(y^{(j)}, r).$$

for $y^{(j)}$, the amount of income that a family of size j needs to be at the same utility level as a family of size r of average income level.

Equivalence scales, e_j , are generally expressed as the fraction of $y^{(j)}$ to $\bar{y}_{\cdot r}$. Thus an equivalence scale of 2 indicates that a family of size j needs twice as much income as a family of size r to achieve an equivalent level of utility.

¹³ Equivalence scales can be derived from either “expert advice” or economic and econometric modelling (see Charlier, 2002). Equivalence scales are also important in the analysis of income inequality (see Jenkins, 1991).

Utility can be replaced with some other measure of household welfare. Below we discuss several approaches to estimating equivalence scales, some of which are based upon utility and some of which are not. Our approach, using financial stress measures, addresses the question of how much income households need to have the same probability of experiencing financial stress.

What is Household Welfare?

Nelson (1993) provides a historical overview of the ways in which policy makers and academic researchers have conceived of the notion of “household welfare”. There are two substantive questions: first, how is welfare to be defined and second, whose welfare is it? She points to an increasing divergence in the interests of policy makers and academic researchers. Most policy applications (and older economic theory) define “household welfare” in terms of the material standard of living of all individuals (including children) in the household. The current academic literature, on the other hand, often equates “welfare” with utility (or satisfaction) and focuses exclusively on parental welfare as the outcome of interest.¹⁴

The ordinalist revolution in the 1930s seems to have played a large role in this divergence (see Cooter and Rappoport, 1984, Browning, 1992, and Nelson, 1993). The term “ordinalist revolution” refers to the rejection of cardinal utility and to the general acceptance amongst economists that utility is not comparable across individuals, i.e., is an ordinal concept only. Prior to the 1930s, economics was seen as the science of “material welfare”. In this framework, goods yielded utility if they contributed to the individual’s physical well-being – or almost equivalently to productive capacity (Cooter and Rappoport, 1984, p. 509). Making interpersonal comparisons was not a problem because utility was based on physical or material needs – rather than preferences – and different individuals’ physical and material needs were likely to be much the same. This led quite naturally to the idea of using proxies for material well-being (most commonly food expenditure, but also necessities and later “adult” goods) to estimate equivalence scales.¹⁵

Utility based equivalence scales were first discussed in Muellbauer (1974) and -- as Nelson (1993) argues -- redefined the notion of “welfare” from the material well-being to one of subjective utility (i.e., happiness or satisfaction) and shifted the locus of welfare from all individuals to parents only.¹⁶

In particular, Pollak (1991) discusses some of the issues involved in moving from a theoretical concept of “utility” -- which is fundamentally individual based -- to the more practical issue of families and households. He proposes that one must either accept the notion of household (family) preferences or we must confront two distinct issues: first, conflicting adult preferences within the household and second, the treatment of children’s needs and wants. Our approach will look directly at the occurrence of events which lead to negative consequences for all members of the household (missing rent payments which could lead to eviction, missing utility

¹⁴ So the distinction is between having the resources to finance a certain consumption level as opposed to the satisfaction or happiness associated with it.

¹⁵ Nelson (1993) discusses the development of the Engle method and other food-based equivalence scales.

¹⁶ Sen (1987) discusses the difference between the utility or satisfaction-based notion of welfare and welfare in the sense of standard of living.

payments which could lead to having electricity disconnected, etc.) including children. Irrespective of one's position on household preferences, sharing rules, or conflict between adult and child preferences, it is clear that such events will negatively impact children.

Why is What We Are Doing Important?

This project will estimate equivalence scales from measures of financial stress. It is more in keeping with the material well-being notion of "welfare" rather than a more utility- or satisfaction-based concept. We're also moving away from subject to somewhat more objective survey data as our foundation for the analysis. So some things to think about,

- Nelson (1993), pg. 485, "As questions of the distribution of pure subjective happiness are rarely raised in practical situations, equivalence scales in the older, more materialistic, and more objective sense remain of great practical concern."
- In her suggestions for future research, Nelson (1993) pg. 487 argues for improving "the theory and empirical comparison of material standards of living across households of different compositions, where the term "household" is understood to encompass all members.
- Cooter and Rappoport (1984), pp. 509. "...may be fruitful to use material welfare notion in present-day welfare problems." But they don't do it in their paper.
- Calasanto, et al (1984), pg. 128 makes the point that objective definitions of poverty are often based on others' expert judgment (food-based expert) or the judgment of an expert group. Subjective definitions often (but not always) ask individuals to make an assessment of their own situation. We'll be doing something different in that our measure will be more objective, but will not rely on expert advice.
- Like the Dutch literature (see below) we will also be relying on the responses of the head to adequately represent the welfare of everyone in the household. BUT this may be less of a problem in our case because we will be concerned with the head's (objective) reports of whether the household has missed a rent/mortgage payment as opposed to whether the head sees a particular income level as satisfactory.
- Finally, it doesn't seem to be too hard to argue that we should have a special interest (for developmental reasons and social externalities if nothing else) in the resources available to children and their living standards. Piggou said that poverty (especially of children) represented a significant untapped resource. The dividends from investing in this resource would be greater than that from investing in machines (see Cotter and Rappoport).
- Many policy applications are centred around providing a safety net at the bottom. Focusing on the factors related to financial stress seems very consistent with this.

Methodological Issues:

The academic equivalence scale literature (reviewed below) generally rests on a utility- or satisfaction-based notion of welfare. There are a number of methodological issues that have arisen over the years.

What can you do with demand data?

Pollak and Wales (1979) argued that the type of equivalence scale (which they refer to as “unconditional”) required for welfare analysis are logically distinct from those that emerge from demand analysis (“conditional” equivalence scales). This is because conditional equivalence scales compare preferences over consumption vectors holding household demographic composition fixed. Unconditional equivalence scales, on the other hand, instead define preferences over both demographic composition as well as consumption goods. Importantly, demand data alone are not sufficient to identify unconditional (welfare) equivalence scales. Intuitively, demand data identify the indifference curves (what van Praag (1991) calls the “horizontal” dimension of utility) themselves, but cannot identify how far the indifference curve is from the origin (the “vertical” dimension).

This then raises the question: What would it take to identify equivalence scales useful for welfare analysis? A literature has arisen addressing this question. (See in particular, Blundell and Lewbel, 1991 and Kapteyn, 1994.) Kapteyn (1994) notes that when one faces such an identification problem -- such as that posed above -- there are generally three basic choices. First, simply accept the problem and try to live with it. Second, make additional assumptions adding structure to the problem. Third, invoke additional information.

Blundell and Lewbel (1991) offer one strategy for living with it. They demonstrate that although equivalence scales are themselves not identified in any given price regime, the evolution of equivalence scales as prices change is identified. Thus, we could give up on the idea of estimating equivalence scales directly and focus on changes in equivalence scales. Kapetyn (1994) argues, however, that this is not particularly interesting.

The most common strategy for putting additional structure on the problem is to make the Independence of Base (IB) assumption. This says that the ratio of cost functions for two households is independent of the level of utility at which the cost functions are evaluated. (See Kapetyn’s review of this.) This assumption is generally rejected when tested empirically (e.g., Blundell and Lewbel, 1991).

Finally, the use of additional information has been the focus of a very large (almost exclusively Dutch) literature attempting to use direct questions about utility levels to identify equivalence scales (see the review below).

Direct Measurement of Welfare Using Subjective Survey Questions:

Two types of subjective questions have been widely used in the literature in an attempt to directly measure what van Praag (1991) referred to as the “vertical” dimension of utility.¹⁷

- Individual Welfare Function of Income (WFI) or Income Evaluation Question (IEQ)¹⁸: This question surveys individuals about how much family income they feel would be required to obtain a certain utility level (e.g., very bad, bad, insufficient, ...good, very good).

This question has been used in the literature primarily by van Praag (1971) -- who initially proposed this question -- and his subsequent students and colleagues. Van Praag (1991) reviews the history of utility theory and makes an interesting and strong case for cardinal versus ordinal utility. He then proposes that the Pollak and Wales (1979) dilemma can be solved with a combination of demand data (to measure the horizontal dimension of utility) and the IEQ (to measure the horizontal dimension).

Van Praag and van der Sar (1988) develop an ordinal (rather than cardinal) notion of the individual welfare function of income and compare estimates derived across a range of countries. They conclude that this method has a conventional economic interpretation, but by giving up on cardinal utility one cannot compare different welfare positions and cannot deal with normative issues in taxation and income policy.

- Satisfaction with Actual Income: This question asks respondents about their satisfaction with their own actual income.

Melenberg and van Soest (1996) compare the estimated costs of children that result from the two questions above. They find that the using the first question to estimate the cost of children results in implausibly low estimates, while the second question results in much higher costs of children. The authors argue that they tend to have more confidence in the outcomes based on this latter question because the direct question about satisfaction with current income does not require that the respondent form views about hypothetical situations. Still, the standard errors in the satisfaction with current income models are very large and depend upon model specification.¹⁹

- Minimum Income Requirement: This question asks respondents about the minimum income they would require.

This question (and variations of it) has most often been used in the context of settling the poverty line. Goedhard, et al. (1977) proposed this as a new way of

¹⁷ See Hartog (1988) for a review of the Leyden approach of measuring the individual function of welfare. Vaughan (1984) also contains a large number of references to this literature.

¹⁸ See, in particular, van Praag (1971; 1991) and Kapetyn (1994) and the references therein. Further, Melenberg and van Soest (1996) provide a nice review of the recent literature including a discussion of the literature on various methodological issues in using this scale. Hartog (1988) provides a nice non-technical review of this literature.

¹⁹ See also Vaughan (1984) who provides a nice over view of the use of what he calls direct subjective measurement of welfare.

calculating the poverty line and compared it to alternative approaches (i.e., political decisions or subsistence levels). The authors argued that any definition of poverty rests on the notion that an individual is poor when he experiences a low level of welfare (p. 511) and in the context of the WFI a low level of welfare meant that the utility associated with one's income had fallen below a certain minimum level. The minimum income question was then used to get at this. (Note, however, that the welfare level associated with a respondent's minimum income is not independent of his actual income.)

This concept has motivated a number of related research projects on subjective poverty lines. The idea is quite straightforward. A family is considered to be poor when its income restricts consumption so severely that it feels that it cannot "make ends meet" (van Praag, et al., 1980; Colasanto, et al., 1984; Danziger, et al., 1984). Because the response to a minimum income question is likely to systematically vary with actual income, only respondents with just enough income "to make ends meet" will on average give the "correct or true" answer. In general, the resulting scale is relatively flat with respect to family size suggesting that equivalence scales based only on food consumption underestimate the economies of scale associated with increasing family size. This is also consistent with van Praag, et al, (1982) who compare a poverty line based on food consumption with the Leyden poverty line which is based on the WFI.²⁰

Finally, Belemare, et al. (2002) use semi-parametrics to estimate an ordered response model of the IEQ, while Charlier (2002) focuses on the estimation of equivalence scales in a panel data context.

Estimation

We estimate three different models for which we calculate equivalence scales. The first model uses only income and family size to build the equivalence scale. It does not control for family type (other than size), age of family members, or adult/child composition within the family. The second model separates out the effect of children and adults and controls for different ages of children. It also allows the effect of the first child to be different from that of subsequent children. The third model controls for those things and the difference between couple-headed households and single-headed households. Couple-headed households may be able to engage in complementary activities (at home or in the work place or both) which enable them to avoid financial stress more easily than single-headed households even at the same income levels and with the same family size.

Basic Model

Let p^* be the propensity to experience financial stress. We will build the equivalence scale from a simple model that relates this latent variable to family size (fs) and income (y).

$$(4) \quad p^* = \beta_1 + \beta_2 \ln(y) + \beta_3 \ln(fs) + u$$

²⁰ Kapteyn, et al., (1988) shows that selection problems associated with not responding to the IEQ and mis-measurement of income can be quite important in the calculation of this type of poverty line.

For this model, a general formulation for an equivalence scale for a reference family of size r can be derived as follows. Average propensity to experience financial stress for families of size r is given by

$$(5) \quad p_{.r} = \beta_1 + \beta_2 \ln(\bar{y}_{.r}) + \beta_3 \ln(r).$$

We want to find the income level $y^{(j)}$ for which of family of size j has utility equivalent to $p_{.r}$. Thus we have

$$(6) \quad p_{.r} = \beta_1 + \beta_2 \ln(y^{(j)}) + \beta_3 \ln(j).$$

Since (5) and (6) are equal, the equivalence scale is derived as

$$\begin{aligned} \beta_1 + \beta_2 \ln(\bar{y}_{.r}) + \beta_3 \ln(r) &= \beta_1 + \beta_2 \ln(y^{(j)}) + \beta_3 \ln(j) \\ \beta_2 \ln(\bar{y}_{.r}) + \beta_3 \ln(r) &= \beta_2 \ln(y^{(j)}) + \beta_3 \ln(j) \\ (7) \quad \ln(y^{(j)}) &= \ln(\bar{y}_{.r}) + \frac{\beta_3}{\beta_2} \ln\left(\frac{r}{j}\right) \\ \ln\left(\frac{y^{(j)}}{\bar{y}_{.r}}\right) &= \frac{\beta_3}{\beta_2} \ln\left(\frac{r}{j}\right) \\ e_j \equiv \frac{y^{(j)}}{\bar{y}_{.r}} &= \left(\frac{j}{r}\right)^{\frac{\beta_3}{\beta_2}} \end{aligned}$$

Data notes

We begin with the 5,539 household observations from HILDA described above. Some pre-exploration of the data convinced us that models where income entered in log form fit better than models where income entered in linear form, so we exclude 20 additional households which report zero income for sample consistency across the different models estimated.

Basic Model: Results

We present estimates for equivalence scales from the basic model in table 9 for the 7 individual financial stress measures considered in this paper, for the ‘cashflow’ and ‘hardship’ measures described above, for the ‘any stress’ measure described above and for a measure which is equal to one if both members of the household report experiencing at least one type of financial stress²¹. We also consider two measures which were used by Breunig et al. (2004)—*public* and *private*. These measures attempt to capture whether the stress was experienced by one individual or the entire household. The public measure is defined as being one member of the household reporting failure to pay mortgage or utilities. The private measure is defined as pawning something or borrowing from friends.

²¹ We report equivalence scales based upon estimation of a probit model of equation (4). A linear probability model gives almost exactly the same equivalence scales.

We pool all family types and use only information on total household size, ignoring information about household composition such as the age of children and whether the household is single-headed or not. We consider the household to have experienced the financial stress measure if either adult in the household reports the measure. We compare these to the standard OECD scale (which does take into account some age composition effects--thus the numbers we present for the OECD equivalence scales in the tables are the averages over our sample for that size household.) The standard OECD scale is 1 for the first adult, .5 for each additional adult and .3 for each child.

Table 10 summarizes the equivalence scales for each measure in order of the size of the equivalence scale generated. In all cases except meals, we find an equivalence scale that is larger than the standard OECD scale. (The coefficient on family size in the meals equation is insignificant and a quick look at the data reveals that it is mostly single-adult households who use skipping meals as a mechanism to cope with financial difficulty.) Utilities yields the largest equivalence scales, indicating that a family of size 4 would need 810% more income than a single adult household in order to have the same propensity to fail to pay their utility bills because of financial difficulty. The cashflow (utilities, mortgage, and friends) results lie between mortgage and utilities. Interestingly this set of measures gives larger equivalence scales than the hardship measure (meals, heat, welfare, pawn). Friends indicates that a 4 person household would need 408% more income than a one-person household to achieve the same-level of well-being. The hardship measures range from a completely flat equivalence scale for meals to 343% for pawn. The overall hardship measure gives an equivalence scale of 2.53 for a family of 4 indicating that their needs are 253% greater than a single adult.

Table 11 differs from Table 9 in that instead of using the measure "did either member of the couple" report financial stress, we use the measure "did both members of the couple" report financial stress. This produces results that at first glance seem odd. (The coefficient on household size for many of the measures is negative implying that larger households need less income than smaller households to avoid financial stress.) In fact this change in measure has the following consequence: we leave all observations on single-headed households as they were. For couple-headed households, we reduce the number who report financial stress roughly by half. The consequence is that we introduce a large negative correlation between household size and experiencing financial stress. (Confirmed by running a simple model with a dummy variable for couple households.) Couple-headed households have a great advantage over single-headed households in that the two adults can engage in complementary home production and market production activities (at the same time) and can substitute for one another in either of these activities depending upon the demands upon the household. The simple model can not capture the fundamental differences between these two types of households. A preliminary hypothesis from this table is that single-adult households are suffering particularly from financial stress. We will explore this further below.

We estimate the basic model separately on these two subsets of data (couple households and non-couple households). Tables 12 and 13 address the same questions as tables 9 and 11, using only couple households. We find larger equivalence scales than in Table 9 for both the hardship and the non-hardship measures and we find that the results from using "either member of the couple reports" are almost the same as

using the "both members of the couple report." For hardship, the former gives an equivalence scale of 4.84 for a 4-person household relative to a one person household, while the latter gives 4.24. For cashflow, the direction is different but again similar results: 22.27 when we use the "either" measure and 19.74 when we use the "both" measure.

This is evidence that both measures (either couple reports or both couple reports) are reflecting the presence of financial stress in the household. In other work (Breunig et al., 2004), we show that there is evidence consistent with a hypothesis that both members reporting a measure is evidence of severity of the experience of financial stress. The results here are also consistent with that hypothesis.

What we do find is that severity does not have any effect on the ratio of the marginal effects of household size and income. It is this ratio that determines the equivalence scale.

Comparing tables 12 and 13 to tables 9 and 11, we see that the effect on the probability of reporting financial stress of additional family members is larger in the couple-only models? In the models which combine all household types the effect of additional household members is a combined effect of children and adults. In the couple-only households, the effect of additional family members is coming almost exclusively from children. This is evidence that additional children in the household are more expensive (or more likely to lead to financial stress) than additional adults in the household. We explore this more below.

In Table 14, we provide the estimated equivalence scales for single-headed households. (Less than one percent of these households have more than 4 members so we only report for household sizes up to 4.) These generate unrealistically large equivalence scales. Only about 500 of these 2,233 observations have more than one person in the household. All of the variation in household size is driven by the presence of children in relatively worse-off single parent families. Many of these are at very low income levels and the response of financial stress to small increases in income at these income levels is quite large. These two things in combination generate the large equivalence scales. It would be inappropriate to apply these to the population at large, but they do provide a stark vision of how much low-income, single-headed (lone parent) households suffer from financial stress relative to single-adult households.

Tables 15 and 16 are the last set of estimates from the simple model. Here we restrict the sample to only those households with children under the age of 15. In this case, rather surprisingly given the previous results, we get equivalence scales for most measures that are similar to the OECD equivalence scales.

If we add a dummy variable for the single-headed households in the above regression it is not significant. This would seem to indicate that it is not so much the single-headed nature of households that matters, but the presence of children. It would seem that kids really are expensive!

In table 16, we estimate the equivalence scales from the basic model for households without children under 14. (Again we only report for households of size 4 or less

which make up over 99% of the sample.) We find a negative coefficient on household size (more individuals makes household less likely to experience stress) on most measures. However the household size variable was almost never significant in any of these regressions. (The confidence interval on the equivalence scales in this case would contain unity.) Only for meals, friends, and private was the coefficient on household size significant and in all of these cases it was negative.

What is interesting about Tables 15 and 16 viewed together is the large difference made by the presence of children in the household. Once we separate out the two samples (with and without children) we see that the effect of increasing household size is in fact quite modest. In many cases it is even smaller than that implied by the OECD equivalence scales. So the real issue seems to be how can equivalence scales be used to equalize households with and without children.

The response to financial stress for families with children

The above investigation led us to try and address the question: “Is the response of financial stress to income and household size different for families with and without children?” The results above seem to indicate that it is. A more direct test can be conducted by estimating

$$(8) \quad p^* = \beta_1 + \delta_1 D_{anykids} + \beta_2 \ln(y) + \delta_2 \ln(y) * D_{anykids} + \beta_3 \ln(fs) + \delta_3 \ln(fs) * D_{anykids} + u$$

and testing whether the three δ_i coefficients are significant. $D_{anykids}$ is a dummy variable that takes value 1 if there are any kids in the household.

δ_1 and δ_2 were positive and significant for every measure of financial stress. The interpretation is

1. the very presence of children, irrespective of household size, makes families more likely to experience financial stress; and
2. extra income is less effective at preventing financial stress in families that have children than in families that do not.

δ_3 was significant for the overall measures of hardship and cashflow. It was also significant for utilities, pawn, meals, public, and the two or more stress measures.

The response to financial stress for couple-headed households

The estimates reported above for different family types are motivated by the question “Is the response of financial stress to income and household size different for lone parent and couple-headed families ?” The results above seem to indicate that they are not. A more direct test can be conducted by estimating

$$(9) \quad p^* = \beta_1 + \gamma_1 D_{couple} + \beta_2 \ln(y) + \gamma_2 \ln(y) * D_{couple} + \beta_3 \ln(fs) + \gamma_3 \ln(fs) * D_{couple} + u$$

and testing whether the three γ_i coefficients are significant. D_{couple} is a dummy variable that takes value 1 if the household is a couple-headed household.

γ_1 and γ_3 were never significant for any measure of financial stress. γ_2 was significant, but only at the 10% level, for utilities, welfare, public, anystress, hardship, and cashflow.

Thus there is some evidence that the response of financial stress to income is different for couple-headed households. Couple-headed households appear to use their income more effectively to avoid financial stress.

Clearly, a richer model is needed to deal with equivalence scales across family types—singles, lone parents, couples, and families with children can not be lumped into one simple model.

Extended Model

The basic model ignores the details of family composition. In particular, conditional on income, it treats individuals in all age ranges as making the same resource demands on a household. This need not be true. For example two adults may need less or more income to have the same propensity to fall into financial difficulty as one adult with a child.

Given this point and the above results, we began with a much more flexible extended model²². This model is a much more flexible specification which allows us to control for household demographic composition in a much richer fashion than (4). We allow for the effects of children and adults to be different. Both the effect on the level of financial stress and the effect on the marginal effects of income and household size on the propensity to report financial stress are allowed to differ for adults and children. We allow for the effect of children to be different depending upon whether they fall into the 0-4, 5-9, or 10-14 age ranges.

We then proceeded to test down to a simpler specification²³. We find that for all measures that the interaction between family size and dummy variables for different age ranges are insignificant. In this richer model, a simple interaction between family size and the presence of children (as in (8) above) is also insignificant. Thus we drop all of the variables relating to family size with the exception of the log of family size.

For all of the hardship measures, and the combined hardship measure, we find no difference in the dummy variables and the interactive terms for children in different age ranges. Thus for hardship, we simplify the model to the following:

$$(10) \quad p^* = \beta_1 + \beta_2 \ln(y) + \beta_3 \ln(fs) + \gamma_2 \ln(y) * D_{couple} + \delta_1 D_{anykids} + \delta_2 \ln(y) D_{anykids} + u$$

²² See equation A1 in the appendix.

²³ The results from this full model are available from the authors upon request.

For the cashflow measures, individually and taken as a group, we find that there is a difference in the effect of young children (0-4 years of age) and older children (5-14) years of age. Thus for the cashflow measures, our preferred model is

$$(11) \quad p^* = \beta_1 + \beta_2 \ln(y) + \beta_3 \ln(fs) + \gamma_2 \ln(y) * D_{couple} \\ + \delta_1 D_{kids04} + \delta_2 \ln(y) D_{kids04} + \delta_4 D_{kids514} + \delta_5 \ln(y) D_{kids514} + u$$

Tables 18 and 19 present equivalence scales for the two composite measures—cashflow and hardship. There are several points worth noting

1. The equivalence scales using the hardship measure are much flatter with respect to family size than those using the cashflow measure. In other words, the amount of income required to keep families at the same propensity of reporting financial stress as family size grows is much smaller for the hardship measures than for the cashflow measures. This accords with our preliminary results.
2. Couple-headed households are much less likely to report financial stress than single-headed households. (This latter category combines lone parents and single adult households.) It is striking that a couple-headed household with a third adult member is about as likely to report financial stress as a single-headed household.
3. The cost of children in terms of the propensity to report financial stress is very high. Using the hardship measure, a single-household with one child needs 169% more income to remain at the same level of reporting financial stress as a single adult. Likewise, a couple-headed household with a child needs 310% more income to remain at the same level of reporting financial stress as a two-adult, couple household. The cashflow measures show an even larger cost of children.
4. For the cashflow measure, where the effect of children age 0-4 is different than that of children age 5-14, we find that a child added to a household requires the household to have 150% more income if the child is younger than age 5 relative to the case where the child is over age 4. Given the high cost of childcare in Australia, the limited number of places in day care centres in major cities, and the lack of full-day public preschool this is perhaps not surprising.

6. Conclusions and Policy Implications

This study leads to several conclusions regarding the factors associated with financial stress for families living in Australia. It also raises some questions for future research. We discuss both.

The first conclusion is that there is a high incidence of financial stress. Even if we think that the cashflow questions are picking up money mis-management in addition to true financial difficulty, there are a high percentage of people—14% of households—who report serious hardship. The high percentage of people with cashflow

problems—28% of households—might be an indication of the fragility of people’s financial situations. If a household’s budget is so tight that they are periodically forced to miss utility or rent payments, then the household may be only a few missed pay checks, a layoff, or a serious illness away from disaster. In combination with the warnings in the international press about Australia’s property boom and high levels of household debt, this possibility should be a serious policy concern.

The second conclusion which should be troubling for policy makers is the concentration of financial stress in households with children. If children are a primary target of income support policy and if these measures are in fact warning signs of bad events to come, then these results raise the question of the adequacy of the tax and benefit system in protecting children from negative financial events. Based upon these results, family tax benefit and the various parenting payments do not sufficiently compensate households for the extra cost of children.

Households with children are much more likely than households without children to suffer from hardship (17% compared to 12%) and cashflow (40% to 23%) difficulties. Once we correct for income this becomes even more exaggerated, as evidenced by the equivalence scales from Tables 18 and 19. The presence of children causes a large increase in the propensity to experience financial stress. It is worth noting that additional children cause only small increases in the propensity to experience financial stress. In all of our estimates the difference between households with and without children is quite striking.

The third conclusion is that couple-headed households are much more efficient in using their income to avoid financial stress. This is perhaps not surprising as couples can substitute for and complement one another in labour market work, home production and child care. The degree to which they are able to do this is quite striking—a couple-headed household with one adult child needs the same level of income as a single-adult household based upon our estimates.

It is likely that the couple-headed household variable is also picking up the effect of other characteristics. Perhaps people who are able to form and remain in couple relationships also have better time and money management skills that help them to avoid financial stress. People in couple relationships may also have access to a wider support network.

In addition to these conclusions, there are several questions which remain for future research. Two of these deserve mentioning. The first is: Are these measures related to bad outcomes in the future? What we know from the first two waves of HILDA is that both the cashflow and hardship measures are fairly persistent. About half of the households who report a problem in Wave 1 also report one in Wave 2. So these measures do not appear to be random occurrences, but are instead concentrated within certain households. In future waves of HILDA it will be possible to assess whether or not these financial stress measures are good predictors of negative outcomes such as moving or school drop out.

The most intriguing question is: what is the source of the large ‘cost’ of children observed in the equivalence scale measures? There are several possible explanations for the results that we find here. Perhaps having children makes people remember bad

events better and they are thus more likely to report one of the financial stress measures. Perhaps the probability of unexpected expenses increases with the presence of children. It may be that all households are spending nearly all of their income, but that for households without children there are few possibilities for expenses increasing unexpectedly while for households with children these events are more frequent. It may be that the presence of children exacerbates money management problems. One of the biggest challenges facing families with children is finding enough time for all of the things they would like to do. It could be that people spend less time on money-management when they have children and this explains the result we find.

It may also be that families with children cope with a lack of money in different ways than families without children and that these measures are picking up that difference. One might imagine that families with children would prefer to skip paying the utility bill instead of economizing on the food budget. Children can often exert strong pressure for expensive brand names for food and clothing and parents prefer to cater to their children's taste in these areas while cutting corners on some of the measures examined here. Poor children (or poor-looking children) potentially face ostracism at school so parents may do everything in their power to keep buying clothing and paying for school excursions and clubs. In that case, households might try to make ends meet by missing rent payments which will not be observed by the children's peers. It may be that families without children are able to alter their consumption expenditure to make ends meet in ways that are not picked up by these particular questions.

Table 1
Incidence of Financial Stress by Family Type
Either Partner Reports Stress
(Means and Standard Errors)

	Total		Couple		Lone Parents		Singles	
Utilities	0.213	(0.409)	0.195	(0.397)	0.381	(0.486)	0.191	(0.393)
Rent/Mortgage	0.106	(0.308)	0.096	(0.294)	0.170	(0.376)	0.106	(0.308)
Pawning	0.068	(0.252)	0.054	(0.227)	0.130	(0.336)	0.076	(0.266)
Missed Meals	0.050	(0.218)	0.032	(0.176)	0.079	(0.270)	0.077	(0.266)
No Heat	0.043	(0.203)	0.034	(0.182)	0.077	(0.266)	0.050	(0.218)
Friends Loan	0.158	(0.365)	0.131	(0.337)	0.289	(0.454)	0.172	(0.377)
Welfare	0.046	(0.210)	0.032	(0.176)	0.113	(0.317)	0.053	(0.225)
Hardship	0.130	(0.337)	0.098	(0.297)	0.249	(0.433)	0.157	(0.364)
Cashflow	0.280	(0.448)	0.251	(0.433)	0.464	(0.499)	0.275	(0.447)
Any Stress	0.306	(0.461)	0.273	(0.446)	0.502	(0.500)	0.308	(0.462)
Observations	5529		3290		515		1724	

Table 2
Incidence of Financial Stress by Family Type
Both Partners Report Stress
(Means and Standard Errors)

	Total		Couple		Lone Parents		Singles	
Utilities	0.143	(0.350)	0.081	(0.272)	0.381	(0.486)	0.191	(0.393)
Rent/Mortgage	0.067	(0.251)	0.032	(0.176)	0.170	(0.376)	0.106	(0.308)
Pawning	0.044	(0.204)	0.013	(0.115)	0.130	(0.336)	0.076	(0.266)
Missed Meals	0.035	(0.183)	0.007	(0.083)	0.079	(0.270)	0.077	(0.266)
No Heat	0.028	(0.164)	0.009	(0.093)	0.077	(0.266)	0.050	(0.218)
Friends Loan	0.109	(0.312)	0.050	(0.217)	0.289	(0.454)	0.172	(0.377)
Welfare	0.033	(0.177)	0.009	(0.096)	0.113	(0.317)	0.053	(0.225)
Hardship	0.089	(0.284)	0.029	(0.168)	0.249	(0.433)	0.157	(0.364)
Cashflow	0.193	(0.395)	0.109	(0.312)	0.464	(0.499)	0.275	(0.447)
Any Stress	0.216	(0.411)	0.124	(0.303)	0.502	(0.500)	0.308	(0.462)
Observations	5529		3290		515		1724	

Table 3
Incidence of Financial Stress by Family Type
Individual Analysis
(Means and Standard Errors)

	Total		Couple		Lone Parents		Singles	
Utilities	0.154	(0.361)	0.132	(0.338)	0.286	(0.452)	0.194	(0.396)
Rent/Mortgage	0.075	(0.263)	0.063	(0.243)	0.122	(0.327)	0.108	(0.311)
Pawning	0.047	(0.212)	0.035	(0.183)	0.110	(0.313)	0.076	(0.266)
Missed Meals	0.033	(0.179)	0.021	(0.145)	0.064	(0.245)	0.075	(0.264)
No Heat	0.028	(0.164)	0.020	(0.141)	0.056	(0.230)	0.050	(0.217)
Friends Loan	0.124	(0.330)	0.100	(0.300)	0.255	(0.436)	0.174	(0.379)
Welfare	0.035	(0.183)	0.024	(0.154)	0.098	(0.298)	0.054	(0.226)
Hardship	0.094	(0.292)	0.069	(0.254)	0.209	(0.407)	0.157	(0.364)
Cashflow	0.218	(0.413)	0.187	(0.390)	0.389	(0.488)	0.279	(0.449)
Any Stress	0.236	(0.425)	0.202	(0.402)	0.428	(0.495)	0.302	(0.459)
Observations	10703		8105		2224		2131	

Table 4
Incidence of Financial Stress by Income Quintile
Either Partner Reports Stress
(Means and Standard Errors)

	Total		Q1 (Bottom)		Q2		Q3		Q4		Q5 (Top)	
Utilities	0.213	(0.409)	0.274	(0.446)	0.293	(0.455)	0.237	(0.425)	0.171	(0.377)	0.089	(0.285)
Rent/Mortgage	0.106	(0.308)	0.146	(0.353)	0.125	(0.331)	0.120	(0.325)	0.093	(0.291)	0.046	(0.210)
Pawning	0.068	(0.252)	0.113	(0.316)	0.098	(0.297)	0.071	(0.257)	0.033	(0.180)	0.028	(0.164)
Missed Meals	0.050	(0.218)	0.096	(0.294)	0.068	(0.252)	0.052	(0.222)	0.025	(0.156)	0.009	(0.097)
No Heat	0.043	(0.203)	0.090	(0.286)	0.051	(0.221)	0.041	(0.198)	0.026	(0.160)	0.008	(0.090)
Friends Loan	0.158	(0.365)	0.223	(0.417)	0.203	(0.402)	0.181	(0.385)	0.125	(0.330)	0.061	(0.240)
Welfare	0.046	(0.210)	0.095	(0.293)	0.072	(0.258)	0.042	(0.201)	0.015	(0.124)	0.007	(0.086)
Hardship	0.130	(0.337)	0.228	(0.420)	0.187	(0.390)	0.132	(0.339)	0.068	(0.252)	0.039	(0.194)
Cashflow	0.280	(0.448)	0.356	(0.479)	0.366	(0.482)	0.311	(0.463)	0.234	(0.424)	0.128	(0.335)
Any Stress	0.306	(0.461)	0.403	(0.491)	0.393	(0.489)	0.336	(0.473)	0.258	(0.438)	0.143	(0.350)
Observations	5529		1164		1147		1096		1057		1065	

Table 5
Incidence of Financial Stress by Income Quintile
Both Partners Report Stress
(Means and Standard Errors)

	Total		Q1 (Bottom)		Q2		Q3		Q4		Q5 (Top)	
Utilities	0.143	(0.350)	0.226	(0.419)	0.207	(0.405)	0.150	(0.357)	0.096	(0.295)	0.038	(0.192)
Rent/Mortgage	0.067	(0.251)	0.110	(0.313)	0.087	(0.282)	0.071	(0.258)	0.046	(0.210)	0.023	(0.149)
Pawning	0.044	(0.204)	0.092	(0.290)	0.059	(0.235)	0.038	(0.192)	0.018	(0.132)	0.011	(0.105)
Missed Meals	0.035	(0.183)	0.082	(0.275)	0.046	(0.209)	0.033	(0.178)	0.010	(0.102)	0.003	(0.054)
No Heat	0.028	(0.164)	0.071	(0.256)	0.032	(0.176)	0.024	(0.154)	0.011	(0.103)	0.001	(0.031)
Friends Loan	0.109	(0.312)	0.191	(0.393)	0.146	(0.353)	0.112	(0.315)	0.070	(0.255)	0.029	(0.168)
Welfare	0.033	(0.177)	0.079	(0.269)	0.052	(0.222)	0.024	(0.152)	0.007	(0.082)	0.002	(0.049)
Hardship	0.089	(0.284)	0.194	(0.396)	0.123	(0.329)	0.081	(0.273)	0.030	(0.172)	0.017	(0.128)
Cashflow	0.193	(0.395)	0.302	(0.460)	0.265	(0.442)	0.197	(0.398)	0.141	(0.348)	0.063	(0.244)
Any Stress	0.216	(0.411)	0.345	(0.476)	0.292	(0.455)	0.214	(0.410)	0.154	(0.361)	0.076	(0.264)
Observations	5529		1164		1147		1096		1057		1065	

Table 6
Incidence of Financial Stress by Income Quintile
Individual Analysis
(Means and Standard Errors)

	Total		Q1 (Bottom)		Q2		Q3		Q4		Q5 (Top)	
Utilities	0.154	(0.361)	0.233	(0.423)	0.202	(0.402)	0.161	(0.368)	0.115	(0.319)	0.058	(0.234)
Rent/Mortgage	0.075	(0.263)	0.110	(0.313)	0.096	(0.294)	0.084	(0.278)	0.054	(0.226)	0.030	(0.172)
Pawning	0.047	(0.212)	0.082	(0.275)	0.063	(0.242)	0.049	(0.216)	0.026	(0.159)	0.017	(0.128)
Missed Meals	0.033	(0.179)	0.064	(0.245)	0.039	(0.194)	0.037	(0.190)	0.018	(0.131)	0.007	(0.085)
No Heat	0.028	(0.164)	0.066	(0.248)	0.029	(0.169)	0.024	(0.155)	0.015	(0.120)	0.005	(0.069)
Friends Loan	0.124	(0.330)	0.178	(0.383)	0.157	(0.364)	0.136	(0.343)	0.093	(0.291)	0.056	(0.229)
Welfare	0.035	(0.183)	0.076	(0.265)	0.048	(0.215)	0.030	(0.170)	0.009	(0.094)	0.011	(0.105)
Hardship	0.094	(0.292)	0.177	(0.382)	0.123	(0.329)	0.092	(0.289)	0.048	(0.213)	0.032	(0.176)
Cashflow	0.218	(0.413)	0.309	(0.462)	0.277	(0.447)	0.233	(0.423)	0.168	(0.374)	0.101	(0.302)
Any Stress	0.236	(0.425)	0.337	(0.473)	0.295	(0.456)	0.251	(0.434)	0.183	(0.387)	0.116	(0.320)
Observations	10703		2231		2224		2131		2042		2075	

Table 7 Determinants of Hardship (Either Reports)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.004	(6.39)	-0.003	(-5.60)	-0.004	(-6.85)	-0.003	(-5.20)
Lone Parent	0.067	(4.04)	0.046	(2.93)	0.044	(2.74)	0.027	(1.78)
Couple	-0.033	(-3.21)	0.001	(0.15)	-0.071	(-5.88)	-0.048	(-1.33)
De Facto					0.225	(10.37)	0.109	(5.67)
Home Owners			-0.102	(-9.24)			-0.053	(-4.59)
Home Buyers			-0.056	(-4.90)			-0.042	(-3.81)
Net Worth			-0.006	(-7.61)			-0.004	(-5.22)
Non Resident Kids					-0.015	(-1.51)	0.038	(3.44)
Kids 0 – 4					0.010	(1.08)	-0.002	(-0.24)
Kids 5 – 9					0.018	(1.99)	0.007	(0.87)
Kids 10 – 14					0.007	(0.85)	0.006	(0.77)
Unemp. HH							0.084	(6.35)
Ave. Age							0.000	(0.24)
Ave. Age Sq.							0.000	(-1.91)
Poor Health							0.077	(7.51)
BTSI							-0.005	(-0.14)
Imm. (ESB)							-0.015	(-1.35)
Imm. (NESB)							0.016	(1.22)
Inner							0.001	(0.03)
Outer							0.010	(0.54)
Remote							-0.019	(-0.66)
Other NSW							-0.006	(-0.35)
Melbourne							0.007	(0.45)
Other Vic							0.015	(0.66)
Brisbane							0.016	(0.86)
Other QLD							0.020	(0.92)
Adelaide							0.022	(1.07)
Other SA							0.008	(0.29)
Perth							0.036	(1.76)
Other WA							0.060	(1.77)
Tasmania							0.014	(0.46)
NT							-0.062	(-1.16)
ACT							0.006	(0.18)
Observations	5529		5529		5529		5529	

Table 8: Determinants of Cash Flow Problems (Either Reports)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.005	(-8.90)	-0.004	(-7.30)	-0.005	(-8.66)	-0.005	(-7.18)
Lone Parent	0.176	(7.00)	0.146	(5.64)	0.116	(4.52)	0.098	(3.61)
Couple	0.005	(0.36)	0.069	(4.39)	-0.070	(-3.95)	-0.023	(-0.39)
De Facto					0.277	(10.35)	0.108	(4.09)
Home Owners			-0.253	(-14.22)			-0.152	(-7.75)
Home Buyers			-0.075	(-4.04)			-0.059	(-3.10)
Net Worth			-0.015	(-9.19)			-0.012	(-6.89)
Non Resident Kids					-0.068	(-4.44)	0.100	(5.28)
Kids 0 – 4					0.074	(5.39)	0.024	(1.75)
Kids 5 – 9					0.042	(3.20)	0.018	(1.36)
Kids 10 – 14					0.023	(1.81)	0.015	(1.13)
Unemp. HH							0.075	(3.60)
Ave. Age							-0.002	(-0.68)
Ave. Age Sq.							0.000	(-2.01)
Poor Health							0.068	(4.20)
BTSI							-0.029	(-0.50)
Imm. (ESB)							-0.035	(-1.92)
Imm. (NESB)							-0.016	(-0.79)
Inner							-0.042	(-1.65)
Outer							-0.027	(-0.88)
Remote							-0.033	(-0.64)
Other NSW							0.010	(0.31)
Melbourne							0.035	(1.42)
Other Vic							0.037	(0.98)
Brisbane							-0.006	(-0.22)
Other QLD							0.024	(0.68)
Adelaide							0.013	(0.44)
Other SA							-0.021	(-0.45)
Perth							0.003	(0.09)
Other WA							0.034	(0.70)
Tasmania							0.032	(0.65)
NT							-0.009	(-0.09)
ACT							0.003	(0.06)
Observations	5529		5529		5529		5529	

**Table 9: Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if either member of the couple reports)
All households, Sample size: 5520**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 21.50%		Mortgage Incidence: 10.33%	
1	1.00	1.00	1.00	1.00
2	1.49	2.85	1.49	2.51
3	1.86	5.25	1.86	4.31
4	2.19	8.10	2.19	6.32
5	2.53	11.34	2.53	8.51
6	2.84	14.93	2.84	10.84
	Pawn Incidence: 7.01%		Meals Incidence: 5.05%	
1	1.00	1.00	1.00	1.00
2	1.49	1.85	1.49	1.01
3	1.86	2.66	1.86	1.02
4	2.19	3.43	2.19	1.02
5	2.53	4.19	2.53	1.02
6	2.84	4.92	2.84	1.03
	Friends Incidence: 15.98%		Heat Incidence: 4.57%	
1	1.00	1.00	1.00	1.00
2	1.49	2.02	1.49	1.59
3	1.86	3.05	1.86	2.09
4	2.19	4.08	2.19	2.53
5	2.53	5.11	2.53	2.94
6	2.84	6.15	2.84	3.32
	Welfare Incidence: 4.98%		Public Incidence: 23.06%	
1	1.00	1.00	1.00	1.00
2	1.49	1.76	1.49	2.80
3	1.86	2.44	1.86	5.12
4	2.19	3.08	2.19	7.85
5	2.53	3.70	2.53	10.93
6	2.84	4.29	2.84	14.33
	Private Incidence: 18.66%		Two or more stresses Incidence: 18.66%	
1	1.00	1.00	1.00	1.00
2	1.49	2.02	1.49	1.99
3	1.86	3.04	1.86	2.99
4	2.19	4.06	2.19	3.98
5	2.53	5.09	2.53	4.97
6	2.84	6.12	2.84	5.96

Table 9 (continued): Equivalence scales estimated using financial hardship/cashflow measures (=1 if either member of the couple reports) All households, Sample size: 5520

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Any stress Incidence: 30.62%		Hardship Incidence: 13.39%	
1	1.00	1.00	1.00	1.00
2	1.49	2.31	1.49	1.59
3	1.86	3.77	1.86	2.08
4	2.19	5.34	2.19	2.53
5	2.53	6.99	2.53	2.93
6	2.84	8.71	2.84	3.31
		Cashflow Incidence: 27.92%		
Household size		OECD Equivalence Scale	Probit Model, equation (4)	
1		1.00	1.00	
2		1.49	2.53	
3		1.86	4.36	
4		2.19	6.41	
5		2.53	8.65	
6		2.84	11.05	

Table 10: Equivalence scales estimated using financial hardship/cashflow measures (=1 if either member of the couple reports) All households, Sample size: 5520

Probit estimates ordered by size of equivalence scales generated

Measure	Household size		
	2	3	4
Meals	1.01	1.02	1.02
OECD	1.49	1.86	2.19
Heat	1.59	2.09	2.53
Hardship	1.59	2.09	2.53
Welfare	1.76	2.44	3.08
Pawn	1.85	2.66	3.43
Two or more stresses	1.99	2.99	3.98
Private	2.02	3.04	4.06
Friends	2.02	3.05	4.08
Any stress	2.31	3.77	5.34
Mortgage	2.51	4.31	6.32
Cashflow	2.53	4.36	6.41
Public	2.80	5.12	7.85
Utilities	2.85	5.25	8.10

**Table 11: Equivalence scales estimated using financial hardship/cashflow measures (=1 if both members of the couple report)
Sample size: 5520 (All households)**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 14.40%		Mortgage Incidence: 6.47%	
1	1.00	1.00	1.00	1.00
2	1.49	1.44	1.49	0.94
3	1.86	1.79	1.86	0.91
4	2.19	2.08	2.19	0.88
5	2.53	2.34	2.53	0.87
6	2.84	2.58	2.84	0.85
	Pawn Incidence: 4.40%		Meals Incidence: 3.41%	
1	1.00	1.00	1.00	1.00
2	1.49	0.86	1.49	0.42
3	1.86	0.79	1.86	0.25
4	2.19	0.74	2.19	0.18
5	2.53	0.71	2.53	0.13
6	2.84	0.68	2.84	0.12
	Friends Incidence: 10.94%		Heat Incidence: 2.95%	
1	1.00	1.00	1.00	1.00
2	1.49	1.09	1.49	0.93
3	1.86	1.14	1.86	0.90
4	2.19	1.18	2.19	0.87
5	2.53	1.22	2.53	0.85
6	2.84	1.24	2.84	0.84
	Welfare Incidence: 3.37%		Public Incidence: 15.76%	
1	1.00	1.00	1.00	1.00
2	1.49	1.07	1.49	1.42
3	1.86	1.11	1.86	1.74
4	2.19	1.14	2.19	2.01
5	2.53	1.17	2.53	2.25
6	2.84	1.19	2.84	2.47
	Private Incidence: 12.79%		Two or more stresses Incidence: 12.81%	
1	1.00	1.00	1.00	1.00
2	1.49	1.12	1.49	1.18
3	1.86	1.20	1.86	1.31
4	2.19	1.26	2.19	1.40
5	2.53	1.31	2.53	1.48
6	2.84	1.35	2.84	1.55

**Table 11 (continued): Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if both members of the couple reports)
All households, Sample size: 5520**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Any stress Incidence: 21.52%		Hardship Incidence: 9.09%	
1	1.00	1.00	1.00	1.00
2	1.49	1.24	1.49	0.94
3	1.86	1.41	1.86	0.91
4	2.19	1.54	2.19	0.89
5	2.53	1.66	2.53	0.87
6	2.84	1.75	2.84	0.86
		Cashflow Incidence: 19.18%		
Household size		OECD Equivalence Scale	Probit Model, equation (4)	
1		1.00	1.00	
2		1.49	1.26	
3		1.86	1.45	
4		2.19	1.60	
5		2.53	1.72	
6		2.84	1.83	

**Table 12: Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if either member of the couple reports)
Sample size: 3287 (Couples only)**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 20.35%		Mortgage Incidence: 9.80%	
1	1.00	1.00	1.00	1.00
2	1.49	4.90	1.49	4.52
3	1.86	12.41	1.86	10.91
4	2.19	24.00	2.19	20.40
5	2.53	40.03	2.53	33.15
6	2.84	60.80	2.84	49.29
	Pawn Incidence: 5.90%		Meals Incidence: 3.53%	
1	1.00	1.00	1.00	1.00
2	1.49	2.87	1.49	1.56
3	1.86	5.32	1.86	2.02
4	2.19	8.24	2.19	2.43
5	2.53	11.57	2.53	2.81
6	2.84	15.27	2.84	3.15

**Table 12 (continued): Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if both members of the couple reports)
Couples only, Sample size: 3287**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Friends Incidence: 13.87%		Heat Incidence: 3.62%	
1	1.00	1.00	1.00	1.00
2	1.49	3.64	1.49	1.72
3	1.86	7.74	1.86	2.37
4	2.19	13.22	2.19	2.97
5	2.53	20.03	2.53	3.54
6	2.84	28.13	2.84	4.09
	Welfare Incidence: 3.71%		Public Incidence: 21.66%	
1	1.00	1.00	1.00	1.00
2	1.49	2.30	1.49	5.21
3	1.86	3.74	1.86	13.69
4	2.19	5.28	2.19	27.18
5	2.53	6.89	2.53	46.24
6	2.84	8.58	2.84	71.39
	Private Incidence: 16.37%		Two or more stresses Incidence: 16.25%	
1	1.00	1.00	1.00	1.00
2	1.49	3.38	1.49	3.20
3	1.86	6.89	1.86	6.33
4	2.19	11.42	2.19	10.26
5	2.53	16.90	2.53	14.93
6	2.84	23.28	2.84	20.28
	Any stress Incidence: 28.23%		Hardship Incidence: 10.40%	
1	1.00	1.00	1.00	1.00
2	1.49	3.83	1.49	2.20
3	1.86	8.39	1.86	3.49
4	2.19	14.65	2.19	4.84
5	2.53	22.58	2.53	6.24
6	2.84	32.14	2.84	7.68
		Cashflow Incidence: 19.18%		
Household size		OECD Equivalence Scale	Probit Model, equation (4)	
1		1.00	1.00	
2		1.49	4.72	
3		1.86	11.70	
4		2.19	22.27	
5		2.53	36.70	
6		2.84	55.19	

**Table 13: Equivalence scales estimated using financial hardship/cashflow measures (=1 if both members of the couple report)
Sample size: 3287 (Couples only)**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 8.43%		Mortgage Incidence: 3.32%	
1	1.00	1.00	1.00	1.00
2	1.49	4.53	1.49	3.79
3	1.86	10.97	1.86	8.27
4	2.19	20.54	2.19	14.38
5	2.53	33.42	2.53	22.08
6	2.84	49.73	2.84	31.35
	Pawn Incidence: 1.52%		Meals Incidence: 0.76%	
1	1.00	1.00	1.00	1.00
2	1.49	2.86	1.49	1.19
3	1.86	5.28	1.86	1.32
4	2.19	8.16	2.19	1.41
5	2.53	11.44	2.53	1.50
6	2.84	15.07	2.84	1.56
	Friends Incidence: 5.42%		Heat Incidence: 0.91%	
1	1.00	1.00	1.00	1.00
2	1.49	3.58	1.49	2.21
3	1.86	7.54	1.86	3.52
4	2.19	12.80	2.19	4.90
5	2.53	19.29	2.53	6.32
6	2.84	26.97	2.84	7.79
	Welfare Incidence: 1.00%		Public Incidence: 9.40%	
1	1.00	1.00	1.00	1.00
2	1.49	2.54	1.49	4.86
3	1.86	4.39	1.86	12.25
4	2.19	6.47	2.19	23.62
5	2.53	8.74	2.53	39.30
6	2.84	11.18	2.84	59.56
	Private Incidence: 6.51%		Two or more stresses Incidence: 6.42%	
1	1.00	1.00	1.00	1.00
2	1.49	3.63	1.49	3.60
3	1.86	7.73	1.86	7.61
4	2.19	13.20	2.19	12.95
5	2.53	20.00	2.53	19.57
6	2.84	28.08	2.84	27.40

**Table 13 (continued): Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if both members of the couple reports)
Couples only, Sample size: 3287**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Any stress Incidence: 12.96%		Hardship Incidence: 3.19%	
1	1.00	1.00	1.00	1.00
2	1.49	3.68	1.49	2.49
3	1.86	7.89	1.86	4.24
4	2.19	13.56	2.19	6.19
5	2.53	20.62	2.53	8.30
6	2.84	29.06	2.84	10.54
		Cashflow Incidence: 11.32%		
Household size		OECD Equivalence Scale	Probit Model, equation (4)	
1		1.00	1.00	
2		1.49	4.44	
3		1.86	10.63	
4		2.19	19.74	
5		2.53	31.91	
6		2.84	47.24	

**Table 14: Equivalence scales estimated using
financial hardship/cashflow measures
Sample size: 2233 (Single-adult households only)**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 23.20%		Mortgage Incidence: 11.11%	
1	1.00	1.00	1.00	1.00
2	1.49	10.47	1.49	5.31
3	1.86	41.35	1.86	14.10
4	2.19	109.59	2.19	28.19
	Pawn Incidence: 8.64%		Meals Incidence: 7.30%	
1	1.00	1.00	1.00	1.00
2	1.49	4.35	1.49	1.52
3	1.86	10.27	1.86	1.95
4	2.19	18.90	2.19	2.32
	Friends Incidence: 19.08%		Heat Incidence: 5.96%	
1	1.00	1.00	1.00	1.00
2	1.49	5.82	1.49	3.29
3	1.86	16.29	1.86	6.59
4	2.19	33.82	2.19	10.81
	Welfare Incidence: 6.85%		Public Incidence: 25.12%	
1	1.00	1.00	1.00	1.00
2	1.49	4.13	1.49	10.60
3	1.86	9.47	1.86	42.15
4	2.19	17.07	2.19	112.28
	Private Incidence: 22.03%		Two or more stresses Incidence: 22.21%	
1	1.00	1.00	1.00	1.00
2	1.49	6.12	1.49	4.56
3	1.86	17.64	1.86	11.09
4	2.19	37.40	2.19	20.82
	Any stress Incidence: 34.12%		Hardship Incidence: 17.78%	
1	1.00	1.00	1.00	1.00
2	1.49	7.56	1.49	3.71
3	1.86	24.71	1.86	7.99
4	2.19	57.22	2.19	13.78
	Cashflow Incidence: 30.77%			
1	1.00	1.00		
2	1.49	8.82		
3	1.86	31.50		
4	2.19	77.75		

**Table 15: Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if any member of the couple reports)
Sample size: 1668
Only households with children under 15**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 32.79%		Mortgage Incidence: 14.57%	
1	1.00	1.00	1.00	1.00
2	1.49	1.34	1.49	1.27
3	1.86	1.59	1.86	1.45
4	2.19	1.80	2.19	1.60
5	2.53	1.97	2.53	1.73
6	2.84	2.13	2.84	1.84
	Pawn Incidence: 9.77%		Meals Incidence: 4.68%	
1	1.00	1.00	1.00	1.00
2	1.49	1.21	1.49	1.25
3	1.86	1.35	1.86	1.43
4	2.19	1.46	2.19	1.57
5	2.53	1.55	2.53	1.69
6	2.84	1.63	2.84	1.79
	Friends Incidence: 23.02%		Heat Incidence: 5.04%	
1	1.00	1.00	1.00	1.00
2	1.49	1.02	1.49	1.49
3	1.86	1.03	1.86	1.88
4	2.19	1.04	2.19	2.22
5	2.53	1.05	2.53	2.52
6	2.84	1.06	2.84	2.80
	Welfare Incidence: 7.13%		Public Incidence: 35.01%	
1	1.00	1.00	1.00	1.00
2	1.49	1.16	1.49	1.31
3	1.86	1.27	1.86	1.54
4	2.19	1.35	2.19	1.72
5	2.53	1.42	2.53	1.88
6	2.84	1.47	2.84	2.02
	Private Incidence: 26.44%		Two or more stresses Incidence: 26.20%	
1	1.00	1.00	1.00	1.00
2	1.49	1.00	1.49	1.16
3	1.86	1.00	1.86	1.27
4	2.19	1.00	2.19	1.35
5	2.53	1.00	2.53	1.41
6	2.84	1.00	2.84	1.47

**Table 15 (continued): Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if any member of the couple reports)
Sample size: 1668
Only households with children under 15**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Any stress Incidence: 42.39%		Hardship Incidence: 17.09%	
1	1.00	1.00	1.00	1.00
2	1.49	1.15	1.49	1.18
3	1.86	1.26	1.86	1.30
4	2.19	1.33	2.19	1.39
5	2.53	1.40	2.53	1.47
6	2.84	1.45	2.84	1.53
		Cashflow Incidence: 39.99%		
Household size		OECD Equivalence Scale	Probit Model, equation (4)	
1		1.00	1.00	
2		1.49	1.22	
3		1.86	1.37	
4		2.19	1.48	
5		2.53	1.58	
6		2.84	1.66	

**Table 16: Equivalence scales estimated using
financial hardship/cashflow measures
(=1 if any member of the couple reports)
Sample size: 3852 (Only households without children under 15)**

Household size	OECD Equivalence Scale	Probit Model, equation (4)	OECD Equivalence Scale	Probit Model, equation (4)
	Utilities Incidence: 16.61%		Mortgage Incidence: 8.49%	
1	1.00	1.00	1.00	1.00
2	1.49	1.19	1.49	1.24
3	1.86	1.31	1.86	1.41
4	2.19	1.41	2.19	1.55
	Pawn Incidence: 5.82%		Meals Incidence: 5.22%	
1	1.00	1.00	1.00	1.00
2	1.49	0.63	1.49	0.56
3	1.86	0.49	1.86	0.40
4	2.19	0.40	2.19	0.32
	Friends Incidence: 12.93%		Heat Incidence: 4.36%	
1	1.00	1.00	1.00	1.00
2	1.49	0.45	1.49	1.37
3	1.86	0.28	1.86	1.64
4	2.19	0.20	2.19	1.86
	Welfare Incidence: 4.05%		Public Incidence: 17.89%	
1	1.00	1.00	1.00	1.00
2	1.49	0.96	1.49	1.09
3	1.86	0.93	1.86	1.14
4	2.19	0.92	2.19	1.18
	Private Incidence: 15.29%		Two or more stresses Incidence: 15.39%	
1	1.00	1.00	1.00	1.00
2	1.49	0.47	1.49	0.87
3	1.86	0.30	1.86	0.81
4	2.19	0.22	2.19	0.76
	Any stress Incidence: 25.52%		Hardship Incidence: 11.79%	
1	1.00	1.00	1.00	1.00
2	1.49	0.95	1.49	0.81
3	1.86	0.93	1.86	0.71
4	2.19	0.91	2.19	0.65
	Cashflow Incidence: 22.69%			
1	1.00	1.00		
2	1.49	0.91		
3	1.86	0.86		
4	2.19	0.83		

Note: The coefficient on household size was only significant for meals, friends, and private.

Table 17: Model estimates for hardship and cashflow Equations (10) and (11)

	Measure	
	Hardship	Cashflow
ln(income)	-.255 (.033)	-.153 (.029)
ln(household size)	.235 (.089)	.252 (.076)
ln(income)* $D_{couples}$	-.028 (.007)	-.025 (.006)
D_{kids}	6.21 (0.86)	
D_{kids04}		6.23 (0.98)
$D_{kids514}$		6.77 (0.96)
ln(income)* D_{kids}	-.566 (.082)	
ln(income)* D_{kids04}		-.521 (.091)
ln(income)* $D_{kids514}$		-.602 (.089)

Standard errors in parentheses. All coefficients are significant.

D_{kids04} equals one if the household has a child between the ages of 0 and 4. $D_{kids514}$ equals one if the household has no children between the ages of 0 and 4 but does have children between the ages of 5 and 14.

Table 18: Equivalence scales using hardship measure

Household type	OECD	
Single-headed households without children		
1 adult	1.00	1.00
2 adults	1.50	1.90
3 adults	2.00	2.76
4 adults	2.50	3.59
Multiple-headed households without children		
2 adults	1.50	0.68
3 adults	2.00	0.95
4 adults	2.50	1.20
Single-headed households with children		
1 adults and 1 child	1.30	2.69
1 adults and 2 children	1.60	3.02
1 adults and 3 children	1.90	3.27
1 adults and 4 children	2.20	3.49
2 adults and 1 child	1.80	3.02
2 adults and 2 children	2.10	3.27
Multiple-headed households with children		
2 adults and 1 child	1.80	2.11
2 adults and 2 children	2.10	2.28
2 adults and 3 children	2.40	2.43
2 adults and 4 children	2.70	2.55

Reference household is a single adult.

Table 19: Equivalence scales using cashflow measure

Household type	OECD	
Single-headed households without children		
1 adult	1.00	1.00
2 adults	1.50	3.14
3 adults	2.00	6.12
4 adults	2.50	9.83
Multiple-headed households without children		
2 adults	1.50	0.66
3 adults	2.00	1.17
4 adults	2.50	1.76
Single-headed households with children under age 5		
1 adults and 1 child	1.30	5.53
1 adults and 2 children	1.60	6.43
1 adults and 3 children	1.90	7.16
1 adults and 4 children	2.20	7.78
2 adults and 1 child	1.80	6.43
2 adults and 2 children	2.10	7.16
Multiple-headed households with children under age 5		
2 adults and 1 child	1.80	4.22
2 adults and 2 children	2.10	4.68
2 adults and 3 children	2.40	5.07
2 adults and 4 children	2.70	5.41
Single-headed households with children over age 4		
1 adults and 1 child	1.30	3.87
1 adults and 2 children	1.60	4.43
1 adults and 3 children	1.90	4.88
1 adults and 4 children	2.20	5.25
2 adults and 1 child	1.80	6.43
2 adults and 2 children	2.10	7.16
Multiple-headed households with children over age 4		
2 adults and 1 child	1.80	3.07
2 adults and 2 children	2.10	3.37
2 adults and 3 children	2.40	3.62
2 adults and 4 children	2.70	3.84

Appendix

Equation A1

$$\begin{aligned} p^* = & \beta_1 + \beta_2 \ln(y) + \beta_3 \ln(fs) + \gamma_2 \ln(y) * D_{couple} \\ & + \gamma_1 D_{kids04} + \gamma_2 \ln(y) * D_{kids04} + \gamma_3 \ln(fs) * D_{kids04} \\ & + \gamma_4 D_{kids59} + \gamma_5 \ln(y) * D_{kids59} + \gamma_6 \ln(fs) * D_{kids59} \\ & + \gamma_7 D_{kids1014} + \gamma_8 \ln(y) * D_{kids1014} + \gamma_9 \ln(fs) * D_{kids1014} + u \end{aligned}$$

Table A1 Determinants of Hardship (Both Report)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.003	(-9.11)	-0.002	(-7.76)	-0.003	(-8.92)	-0.002	(-6.89)
Lone Parent	0.037	(3.96)	0.021	(2.57)	0.022	(2.37)	0.008	(1.10)
Couple	-0.094	(-12.34)	-0.071	(-10.13)	-0.118	(-12.43)	-0.051	(-2.52)
De Facto					0.107	(6.08)	0.034	(2.73)
Home Owners			-0.054	(-8.43)			-0.025	(-4.21)
Home Buyers			-0.020	(-3.04)			-0.015	(-2.56)
Net Worth			-0.003	(-6.32)			-0.002	(-4.10)
Non Resident Kids					-0.009	(-1.48)	0.021	(3.48)
Kids 0 – 4					0.007	(1.19)	0.000	(0.08)
Kids 5 – 9					0.007	(1.18)	0.000	(-0.04)
Kids 10 – 14					0.007	(1.14)	0.003	(0.61)
Unemp. HH							0.034	(4.63)
Ave. Age							0.001	(1.39)
Ave. Age Sq.							0.000	(-3.34)
Poor Health							0.043	(7.45)
BTSI							0.032	(1.76)
Imm. (ESB)							0.003	(0.41)
Imm. (NESB)							0.003	(0.47)
Inner							0.011	(1.19)
Outer							0.022	(1.86)
Remote							0.001	(0.08)
Other NSW							-0.015	(-1.66)
Melbourne							0.000	(-0.02)
Other Vic							-0.010	(-0.99)
Brisbane							0.001	(0.14)
Other QLD							-0.010	(-1.03)
Adelaide							-0.002	(-0.22)
Other SA							-0.014	(-1.11)
Perth							0.005	(0.49)
Other WA							0.005	(0.33)
Tasmania							-0.012	(-1.00)
NT							-0.026	(-1.19)
ACT							-0.001	(-0.05)
Observations	5529		5529		5529		5529	

Table A2: Determinants of Hardship (Individual)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.003	-(7.38)	-0.002	-(6.30)	-0.003	-(7.81)	-0.002	-(5.96)
Lone Parent	0.033	(2.89)	0.028	(2.50)	0.023	(2.05)	0.010	(1.00)
Couple	-0.064	-(7.46)	-0.032	-(4.06)	-0.090	-(9.29)	-0.054	-(6.00)
De Facto					0.143	(10.30)	0.069	(5.99)
Home Owners			-0.074	-(9.53)			-0.042	-(5.43)
Home Buyers			-0.046	-(5.91)			-0.033	-(4.67)
Net Worth			-0.004	-(7.03)			-0.003	-(5.29)
Non Resident Kids					-0.016	-(2.47)	0.019	(2.49)
Kids 0 – 4					0.007	(1.24)	0.002	(0.35)
Kids 5 – 9					0.007	(1.15)	0.001	(0.27)
Kids 10 – 14					-0.001	-(0.27)	-0.002	-(0.49)
Unemp. HH Member							0.061	(7.02)
Ave. Age							0.002	(2.54)
Ave. Age Sq.							0.000	-(4.52)
Poor Health							0.069	(9.61)
BTSI							0.019	(0.99)
Imm. (ESB)							0.000	-(0.02)
Imm. (NESB)							0.006	(0.64)
Inner							0.000	(0.04)
Outer							0.013	(0.94)
Remote							-0.025	-(1.39)
Other NSW							-0.008	-(0.64)
Melbourne							-0.001	-(0.13)
Other Vic							0.003	(0.19)
Brisbane							0.005	(0.38)
Other QLD							0.019	(1.26)
Adelaide							0.001	(0.07)
Other SA							0.009	(0.47)
Perth							0.013	(1.07)
Other WA							0.063	(2.59)
Tasmania							0.005	(0.24)
NT							-0.055	-(1.97)
ACT							-0.012	-(0.68)
Observations	10703		10703		10703		10702	

Table A3: Determinants of Cash Flow Problems (Both Report)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.004	(-7.31)	-0.003	(-6.21)	-0.004	(-7.28)	-0.004	(-5.75)
Lone Parent	0.142	(6.96)	0.108	(5.50)	0.086	(4.26)	0.064	(3.24)
Couple	-0.145	(-11.16)	-0.102	(-8.04)	-0.210	(-13.09)	-0.175	(-3.44)
De Facto					0.195	(7.95)	0.049	(2.35)
Home Owners			-0.182	(-13.45)			-0.102	(-7.02)
Home Buyers			-0.046	(-3.24)			-0.036	(-2.54)
Net Worth			-0.010	(-8.75)			-0.007	(-6.51)
Non Resident Kids					-0.061	(-4.93)	0.061	(4.27)
Kids 0 – 4					0.055	(5.26)	0.020	(2.01)
Kids 5 – 9					0.027	(2.56)	0.009	(0.89)
Kids 10 – 14					0.022	(2.07)	0.013	(1.24)
Unemp. HH							0.049	(3.07)
Ave. Age							0.000	(-0.16)
Ave. Age Sq.							0.000	(-2.44)
Poor Health							0.060	(4.58)
BTSI							-0.018	(-0.39)
Imm. (ESB)							-0.035	(-2.48)
Imm. (NESB)							0.000	(0.00)
Inner							-0.026	(-1.39)
Outer							-0.008	(-0.36)
Remote							-0.003	(-0.06)
Other NSW							0.007	(0.31)
Melbourne							0.027	(1.44)
Other Vic							0.020	(0.72)
Brisbane							-0.013	(-0.60)
Other QLD							0.004	(0.15)
Adelaide							-0.020	(-0.91)
Other SA							0.014	(0.38)
Perth							-0.006	(-0.27)
Other WA							0.042	(1.05)
Tasmania							-0.001	(-0.02)
NT							-0.030	(-0.43)
ACT							-0.034	(-1.04)
Observations	5529		5529		5529		5529	

Table A4: Determinants of Cashflow Problems (Individual)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.004	-(8.43)	-0.003	-(6.99)	-0.004	-(8.58)	-0.003	-(6.84)
Lone Parent	0.096	(4.95)	0.087	(4.38)	0.054	(2.86)	0.038	(1.95)
Couple	-0.068	-(5.14)	-0.012	-(0.90)	-0.131	-(8.83)	-0.059	-(3.98)
De Facto					0.204	(10.42)	0.084	(4.71)
Home Owners			-0.200	-(14.61)			-0.142	-(9.99)
Home Buyers			-0.077	-(5.51)			-0.071	-(5.17)
Net Worth			-0.012	-(9.55)			-0.010	-(8.94)
Non Resident Kids					-0.062	-(5.60)	0.045	(3.15)
Kids 0 – 4					0.054	(5.41)	0.028	(2.84)
Kids 5 – 9					0.030	(3.10)	0.014	(1.48)
Kids 10 – 14					0.005	(0.54)	-0.004	-(0.42)
Unemp. HH Member							0.070	(4.79)
Ave. Age							0.007	(4.94)
Ave. Age Sq.							0.000	-(7.20)
Poor Health							0.063	(5.19)
BTSI							-0.016	-(0.50)
Imm. (ESB)							-0.038	-(2.76)
Imm. (NESB)							-0.022	-(1.48)
Inner							-0.025	-(1.32)
Outer							-0.020	-(0.86)
Remote							-0.049	-(1.35)
Other NSW							0.028	(1.17)
Melbourne							0.033	(1.82)
Other Vic							0.033	(1.19)
Brisbane							-0.004	-(0.20)
Other QLD							0.046	(1.71)
Adelaide							0.005	(0.22)
Other SA							0.013	(0.37)
Perth							0.015	(0.68)
Other WA							0.064	(1.62)
Tasmania							0.027	(0.77)
NT							0.025	(0.26)
ACT							-0.027	-(0.74)
Observations	10703		10703		10703		10702	

Table A5: Determinants of Any Stress (Either Reports)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.005	(-9.55)	-0.005	(-7.94)	-0.006	(-9.41)	-0.005	(-7.67)
Lone Parent	0.182	(7.06)	0.155	(5.79)	0.128	(4.82)	0.113	(4.00)
Couple	-0.001	(-0.08)	0.066	(4.04)	-0.076	(-4.20)	-0.047	(-0.74)
De Facto					0.289	(10.67)	0.124	(4.45)
Home Owners			-0.257	(-13.88)			-0.155	(-7.46)
Home Buyers			-0.087	(-4.45)			-0.068	(-3.38)
Net Worth			-0.016	(-8.86)			-0.012	(-6.50)
Non Resident Kids					-0.063	(-4.00)	0.104	(5.35)
Kids 0 – 4					0.076	(5.37)	0.029	(1.94)
Kids 5 – 9					0.044	(3.24)	0.020	(1.45)
Kids 10 – 14					0.015	(1.08)	0.008	(0.61)
Unemp. HH Member							0.112	(5.15)
Ave. Age							-0.003	(-1.03)
Ave. Age Sq.							0.000	(-1.66)
Poor Health							0.101	(6.01)
BTSI							-0.041	(-0.66)
Imm. (ESB)							-0.041	(-2.17)
Imm. (NESB)							-0.007	(-0.31)
Inner							-0.048	(-1.80)
Outer							-0.045	(-1.40)
Remote							-0.061	(-1.14)
Other NSW							0.027	(0.82)
Melbourne							0.027	(1.05)
Other Vic							0.046	(1.18)
Brisbane							0.020	(0.66)
Other QLD							0.052	(1.41)
Adelaide							0.028	(0.90)
Other SA							-0.004	(-0.08)
Perth							0.015	(0.47)
Other WA							0.044	(0.85)
Tasmania							0.047	(0.91)
NT							0.035	(0.33)
ACT							-0.003	(-0.07)
Observations	5529		5529		5529		5529	

Table A6: Determinants of Any Stress (Both Report)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.005	(-7.95)	-0.004	(-6.84)	-0.005	(-8.06)	-0.004	(-6.43)
Lone Parent	0.151	(7.02)	0.120	(5.63)	0.098	(4.53)	0.077	(3.55)
Couple	-0.160	(-11.81)	-0.115	(-8.56)	-0.226	(-13.71)	-0.216	(-3.89)
De Facto					0.225	(8.75)	0.074	(3.14)
Home Owners			-0.193	(-13.32)			-0.108	(-6.86)
Home Buyers			-0.053	(-3.46)			-0.041	(-2.64)
Net Worth			-0.012	(-8.89)			-0.008	(-6.56)
Non Resident Kids					-0.063	(-4.79)	0.063	(4.14)
Kids 0 – 4					0.051	(4.49)	0.016	(1.40)
Kids 5 – 9					0.032	(2.86)	0.014	(1.25)
Kids 10 – 14					0.019	(1.71)	0.011	(0.94)
Unemp. HH Member							0.068	(3.90)
Ave. Age							0.000	(0.07)
Ave. Age Sq.							0.000	(-2.75)
Poor Health							0.090	(6.38)
BTSI							-0.033	(-0.66)
Imm. (ESB)							-0.035	(-2.30)
Imm. (NESB)							0.002	(0.09)
Inner							-0.030	(-1.51)
Outer							0.003	(0.12)
Remote							-0.007	(-0.17)
Other NSW							0.013	(0.51)
Melbourne							0.026	(1.27)
Other Vic							0.012	(0.40)
Brisbane							0.001	(0.06)
Other QLD							0.006	(0.21)
Adelaide							-0.010	(-0.42)
Other SA							0.006	(0.16)
Perth							0.002	(0.09)
Other WA							0.062	(1.41)
Tasmania							0.005	(0.14)
NT							-0.019	(-0.25)
ACT							-0.052	(-1.47)
Observations	5529		5529		5529		5529	

Table A7: Determinants of Any Financial Stress (Individual)
(Probit Coefficients and t-statistics)

	Model 1		Model 2		Model 3		Model 4	
Equiv. Income	-0.004	-(8.82)	-0.003	-(7.34)	-0.004	-(9.11)	-0.003	-(7.25)
Lone Parent	0.111	(5.49)	0.105	(5.00)	0.072	(3.59)	0.054	(2.61)
Couple	-0.074	-(5.50)	-0.016	-(1.18)	-0.136	-(8.99)	-0.066	-(4.29)
De Facto					0.216	(10.76)	0.096	(5.07)
Home Owners			-0.204	-(14.21)			-0.142	-(9.52)
Home Buyers			-0.085	-(5.76)			-0.077	-(5.32)
Net Worth			-0.013	-(9.24)			-0.011	-(8.52)
Non Resident Kids					-0.065	-(5.77)	0.044	(3.01)
Kids 0 – 4					0.051	(4.97)	0.026	(2.49)
Kids 5 – 9					0.029	(2.92)	0.014	(1.39)
Kids 10 – 14					0.000	-(0.05)	-0.009	-(0.94)
Unemp. HH Member							0.087	(5.65)
Ave. Age							0.007	(4.70)
Ave. Age Sq.							0.000	-(7.23)
Poor Health							0.087	(6.95)
BTSI							-0.031	-(0.93)
Imm. (ESB)							-0.037	-(2.47)
Imm. (NESB)							-0.023	-(1.45)
Inner							-0.025	-(1.31)
Outer							-0.018	-(0.76)
Remote							-0.066	-(1.74)
Other NSW							0.031	(1.27)
Melbourne							0.029	(1.56)
Other Vic							0.035	(1.21)
Brisbane							0.012	(0.54)
Other QLD							0.057	(2.09)
Adelaide							0.009	(0.41)
Other SA							0.023	(0.61)
Perth							0.017	(0.75)
Other WA							0.091	(2.14)
Tasmania							0.043	(1.15)
NT							0.029	(0.29)
ACT							-0.035	-(0.92)
Observations	10703		10703		10703		10702	

References:

- Bellemare, Charles, Bertrand Melenberg, Aurthur van Soest, 2002. "Semi-parametric Models for Satisfaction with Income", unpublished working paper.
- Blundell, Richard and Authur Lewbel, 1991. "The Information Content of Equivalence Scales", *Journal of Econometrics*, 50, pp. 49 – 68.
- Bray, J. Rob, 2001. "Hardship in Australia: An Analysis of Financial Stress Indicators in the 1998-99 Australian Bureau of Statistics Household Expenditure Survey", Occasional Paper No. 4, Department of Family and Community Services.
- Breunig, Robert, Deborah Cobb-Clark, Xiaodong Gong, and Danielle Venn. "Disagreement in Partner's Reports of Material Hardship." Australian National University, unpublished working paper.
- Browning, Martin, 1992. "Children and Household Economic Behavior", *Journal of Economic Literature*, Vol. 30 (3), September, pp. 1434 – 1475.
- Charlier, Erwin, 2002. "Equivalence Scales in an Intertemporal Setting with An Application to the Former West Germany", *Review of Income and Wealth*, Series 48, No. 1, March, pp. 99 – 126.
- Colasanto, Diane, Arie Kapteyn, Jacques van der Gaag, 1984. "Two Subjective Definitions of Poverty; Results from the Wisconsin Basic Needs Study", *The Journal of Human Resources*, Vol. 19 (1), Winter, pp. 127 – 138.
- Cooter, Robert and Peter Rappoport, 1984. "Were the Ordinalists Wrong about Welfare Economics", *Journal of Economic Literature*, Vol. XXII, June, pp. 507 – 530.
- Danziger, Sheldon, Jacques van der Gaag, Michael K. Taussig, Eugene Smolensky, 1984. "The Direct Measurement of Welfare Levels: How Much Does it Cost to Make Ends Meet", *The Review of Economics and Statistics*, Vol. 66(3), pp. 500 – 505.
- Goedhart, Theo, Victor Halberstadt, Arie Kapteyn, and Bernard van Praag, 1977. "The Poverty Line: Concept and Measurement", *Journal of Human Resources*, Vol. 12(4), Autumn, pp. 503 – 520.
- Hartog, Joop, 1988. "Poverty and the Measurement of Individual Welfare: A Review of A.J.M. Hagenaars' The Perception of Poverty", *Journal of Human Resources*, 23 (2), pp. 243 – 266.
- Jenkins, Stephen P., 1991. "The Measurement of Income Inequality" in *Economic Inequality and Poverty*, L. Osberg (editor), New York: M.E. Sharpe.

- Kapteyn, Arie, 1994. "The Measurement of Household Cost Functions: Revealed Preference versus Subjective Measures", *Journal of Population Economics*, 7, pp. 333 – 350.
- , Peter Kooreman, Rob Willemse, 1988. "Some Methodological Issues in the Implementation of Subjective Poverty Definitions", *The Journal of Human Resources*, Vol. 23 (2), Spring, pp. 222 – 242.
- La Cava, Gianni and John Simon, 2003. "A Tale of Two Surveys: Household Debt and Financial Constrains in Australia", Research Discussion Paper, 2003-008, Reserve Bank of Australia, July 2003.
- Melenberg, B. and A.H.O. van Soest, 1996. "Measuring the Costs of Children: Parametric and Semi-Parametric Estimators", *Statistica Neerlandica*, Vol. 50(1), pp. 171 – 192.
- Nelson, Julie A., 1993. "Household Equivalence Scales: Theory versus Policy", *Journal of Labor Economics*, Vol. 11. (3), pp. 471 – 493.
- Pollak, Robert A. and Terence J. Wales, 1979. "Welfare Comparisons and Equivalence Scales", *American Economic Review*, Vol. 69(2), May, pp. 216 – 221.
- Sen, Amartya, 1987. *The Standard of Living*. Cambridge: Cambridge University Press.
- van Praag, Bernard M.S., 1991. "Ordinal and Cardinal Utility", *Journal of Econometrics*, 50, pp. 69 – 89.
- , 1971. "The Individual Welfare Function in Belgium: An Empirical Investigation", *European Economic Review*, 2, pp. 227 – 269.
- , Theo Goedhart, Arie Kapteyn, 1980. "The Poverty Line: A Pilot Survey In Europe", *The Review of Economics and Statistics*, Vol. 62(3) August, pp. 461 – 465.
- , Jan S. Spit, Huib van de Stadt, 1982. "A Comparison between the Food Ratio Poverty Line and the Leyden Poverty Line", *The Review of Economics and Statistics*, Vol. 64 (4), November, pp. 691 – 694.
- Vaughan, Denton R., 1984. "Using Selective Assessments of Income to Estimate Family Equivalence Scales: A Report on Work in Progress", Proceedings of the Social Statistics Section of the American Statistical Association, pp. 496 – 501.