

Breunig, Robert; Hasan, Syed; Hunter, Boyd

**Working Paper**

## Financial stress and Indigenous Australians

GLO Discussion Paper, No. 164

**Provided in Cooperation with:**  
Global Labor Organization (GLO)

Suggested Citation: Breunig, Robert; Hasan, Syed; Hunter, Boyd (2018) : Financial stress and Indigenous Australians, GLO Discussion Paper, No. 164, Global Labor Organization (GLO), Maastricht

This Version is available at:  
<http://hdl.handle.net/10419/173215>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Financial stress and Indigenous Australians\*

Robert Breunig\*, Syed Hasan†, and Boyd Hunter‡

\*Tax and Transfer Policy Institute, Crawford School of Public Policy, Australian National University, Canberra and Institute for the Study of Labor (IZA)

†Crawford School of Public Policy, Australian National University, Canberra

‡Centre for Aboriginal Economic Policy Research, Australian National University, Canberra.

December 20, 2017

## Abstract

We examine the high levels of financial stress among Indigenous populations in Australia. We estimate separate models for the determinants of financial stress for Indigenous and non-Indigenous households and show the importance of separately considering Indigenous disadvantage. We use these models to build equivalence scales for both groups. We find evidence consistent with financial stress being exacerbated by demand-sharing (“humbugging”). The evidence also suggests that financial stress is reduced by engagement in traditional hunting and gathering activities.

**JEL-Classification:** I31, I32, J15.

**Keywords:** financial stress, hardship, cashflow, equivalence scales, Indigenous poverty.

---

\*Corresponding author: [Robert.Breunig@anu.edu.au](mailto:Robert.Breunig@anu.edu.au), Crawford School of Public Policy, Australian National University, Canberra ACT 0200, Australia. This paper uses the general release file of the Household, Income and Labour Dynamics in Australia (HILDA) survey. HILDA is funded by the Australian Government Department of Social Services (DSS) and managed by the Melbourne Institute. The findings and views reported in this paper are those of the authors alone and should not be attributed to either DSS or the Melbourne Institute.

## 1. INTRODUCTION

This paper makes two contributions. The first is to estimate models of financial stress for Indigenous and non-Indigenous Australians and show how these differ. Secondly, we use these models of financial stress to estimate equivalence scales for Indigenous and non-Indigenous Australians. These equivalence scales can be used to equate incomes across households of different size in the same way that consumption-based equivalence scales are used. We show how equivalence scales differ for Indigenous and non-Indigenous Australians and we also consider the special role of remoteness and housing arrangements in understanding Indigenous disadvantage in Australia.

Income and poverty studies in the past have noted that many Indigenous people experience resource deprivation and extreme financial disadvantage relative to other Australian citizens—[Henderson \(1975\)](#) and [Australian Government \(2009\)](#). Poverty analysis of Indigenous Australians has long been held back by the fact that their historical circumstances are so different from that of other people that the use of the standard toolkit of poverty researchers was manifestly inadequate ([Altman & Hunter, 1998](#)). For example, Indigenous people live in households that are very large and socially complex—that is Indigenous households tend to be multi-family, multi-generational and highly fluid (or even ‘porous’) so that the size and composition of the households is not necessarily well defined. Many Indigenous Australians live in remote and regional areas where prices are substantially higher than in urban Australia<sup>1</sup>, while customary activities in those areas—such as hunting and gathering—can provide considerable sustenance and resources that are not transacted in the market.<sup>2</sup> One crucial problem for poverty studies is that the equivalence scales used to control for differences in the size, composition, and characteristics of households are often based on non-Indigenous or non-Australian studies that are most likely culturally inappropriate (e.g., [Henderson, 1975](#)).

Like poverty, financial stress is often associated with inadequate financial resources relative to household need, and the problems of constructing valid comparisons between Indigenous and non-Indigenous Australians are considerable. The lack of reliable measures of income and expenditure for Indigenous Australians means that there are limited options for identifying distinct Indigenous-

---

<sup>1</sup>See [Ferguson et al. \(2016\)](#).

<sup>2</sup>[Daly & Smith \(2002\)](#) discuss the important differences in Indigenous population characteristics and also discuss the culturally-based practices and systems of socio-economic organisation that differ greatly from the rest of society.

specific needs with respect to financial and other resources (Hunter et al., 2003, 2004). Fortunately, there are several large-scale datasets with reliable and comparable data on financial stress for both Indigenous and other Australians. Hence it should be possible to identify the Indigenous-specific factors underlying financial stress in Australia. This paper uses the 2014-15 National Aboriginal and Torres Strait Islander Social Survey (NATSISS) and wave 14 of the Household Income and Labour Dynamics in Australia (HILDA) survey, also collected at a similar time period, to illustrate whether the processes underlying Indigenous financial stress are different than among other Australians.

We use the models of financial stress we develop to produce equivalence scales. Equivalence scales can be thought of as an index for a particular household type that equates the income required to achieve the same utility or welfare as a reference household (say 2 adults and no children). Food expenditure is often used to create equivalence scales as the share of food expenditure in total consumption has been found to be monotonically decreasing in income (see Deaton & Muellbauer (1980)).<sup>3</sup> If we believe that utility is increasing in income, then any necessity that has a monotonic relationship with income can be used to create an equivalence scale. In our particular case, we can think of the equivalence scale as telling us about the amount of additional income required to achieve the same probability of experiencing financial stress. Inasmuch as financial stress is a good proxy for underlying utility, the equivalence scale will have this additional interpretation.

This approach allows us to compare Indigenous-specific equivalence scales to those constructed for other Australians or other populations using the same methodology. This will help us to determine whether an alternative treatment of equivalence scales is warranted for Indigenous Australians. Hunter et al. (2004) show how poverty measurement among Indigenous Australians is quite sensitive to the choice of equivalence scale. The significance of this paper is that equivalence scales are commonly employed in public policy analysis, especially with respect to the design and implementation of tax and transfer policies. Hitherto there has been a dearth of literature on the relevant equivalence scales to be applied to Australia's Indigenous population when formulating such policies.

To briefly preview the main results: we find substantial financial stress among Indigenous Australians. We find that the determinants of financial stress for Indigenous Australians are similar

---

<sup>3</sup>This finding of a monotonic relationship between food expenditure share and income goes back to the pioneering work of Ducpétiaux (1855) and Engel (1857).

to those of non-Indigenous Australians. However, the equivalence scales that we derive are quite different for Indigenous and non-Indigenous Australians. Indigenous Australians appear to do better as household size increases in that the amount of additional income they need to remain at a similar level of financial stress is lower. This likely corresponds to better coping mechanisms in the face of disadvantage which could include both experience in dealing with insufficient resources and managing large, fluid households but also recourse to traditional food gathering activities which may replace money income. We find some evidence for this in that those living in remote areas (and those practicing hunting and gathering) are less likely to experience financial stress conditional on other characteristics. In contrast, the multi-family model of living seems to exacerbate financial stress in Indigenous communities. This could be evidence that demand-sharing, or “humberging”, does in fact create financial stress for those who are targeted.

The next section provides some further background to the issues and the approach taken in this paper. This is followed by an overview of the data. Financial stress is modelled using standard econometric techniques and the estimates are used to calculate equivalence scales for different sub-populations. The concluding section briefly elaborates on the implications of the findings for policy-makers and researchers.

## 2. BACKGROUND

Neoclassical economic models are based on households making consumption decisions within budget constraints so as to maximise their utility. Financial stress (FS) can occur in two ways: as a result of an inadequate household budget (i.e. income poverty) or where a household considers that the ‘household stress’ has a lower disutility than alternative patterns of behaviour and consumption. [Bray \(2001\)](#) argues that some outcomes may look like ‘hardship’, but are really a rational decision by an individual who weighs up anticipated costs and benefits of various options. When analysing a sub-population like Indigenous Australians, it is important to consider, additionally, that some consumption choices may be linked to social or cultural norms.

Financial stress represents the strain in a household associated with either a lack of financial resources or an inability to manage the available resources. However, FS can be associated with an inability to manage a debt burden effectively or even the lack of access to appropriate financial

infrastructure rather than indicating a lack of income or material deprivation. [Bray \(2001\)](#) and [Breunig & Cobb-Clark \(2006\)](#) have argued that such considerations mean that it is essential to distinguish between the various forms of FS—especially financial hardship and cash flow problems.

Financial stress is one probable consequence of a prolonged experience of poverty. While this paper is motivated by the inadequacies of the existing literature on Indigenous poverty, there is a clear conceptual distinction between FS and poverty, even though there is some scope for overlap. In modelling FS, it is important to attempt to control for factors that are associated with debt burden and access to financial infrastructure, so that some inference can be made about the factors that are more likely to be associated with poverty per se.

One motivation for this paper is to empirically model the processes underlying FS of Indigenous and non-Indigenous Australians. Two specifications of FS are considered: a parsimonious specification that allows comparisons between Indigenous and non-Indigenous Australian and a richer specification that controls for additional factors (complicated household structures, engagement in hunting and gathering activities, and remoteness) that are likely to be particularly important in the Indigenous context. Indigenous customary activities in remote areas, such as living on homelands and hunting and gathering activities, may reduce the FS of households. On the other hand, remoteness may contribute in increasing FS through a higher cost of economic activity. A related issue is that household income and household size - the two most important factors that determine equivalence scales - may influence the effect of other variables on the FS of a household. Therefore, in our analysis, we control for all those factors, including their interaction with household income and size.

While the more extensive specification may provide a better description of the data, we may prefer a simpler model for generating equivalence scales. Equivalence scales are often generated from simple models (see [Deaton & Muellbauer \(1980\)](#), for example) which are driven by correlation between income and food expenditure. They are not based on causally identified models. If the relationship between income and unobservables changes, then the equivalence scales change. This further highlights the need for context-specific equivalence scales. Notwithstanding, several expanded specifications are used here in an attempt to better understand how the processes underlying financial stress and poverty in Indigenous and other populations might differ substantially.

A significant number of previous studies (Bray (2001), La Cava & Simon (2005), Breunig & Cobb-Clark (2006), Yates (2007), Marks (2007), Phillips & Nepal (2012), Ryan (2012), Cobb-Clark & Ribar (2012) and Read et al. (2014)) attempted to identify the determinants of financial stress of Australian households. These studies typically find household income to be the most important variable associated with FS. It is a strong empirical regularity that FS falls as household income rises. In contrast, given household income, research typically finds a positive relationship between household size and FS. In other words, as household size increases so does FS. Not surprisingly, wealthier households have a better capacity to manage FS as resources can be mobilised in case of a negative financial event. In the same way, households may enjoy a lower FS if their accommodation is owned, compared to rented.<sup>4</sup>

A variety of other variables have also been found to be related to financial stress. Relationship status of household members may affect FS. Couple-headed households (either married or de facto partnerships) may enjoy the advantage of simultaneously working in complementary home and market activities and may also substitute for one another in either of these activities when needed. The presence of children, by increasing costs and perhaps by exacerbating financial management, seems to increase the FS of households. Indeed Breunig and Cobb-Clark (2006), using Australian data, find that households with children are much more likely than households without children to suffer from FS (as measured by financial hardship). Cobb-Clark & Ribar (2012) find that FS and borrowing constraints are related to earlier periods of economic inactivity. Multi-family households may be different than other households and may act differently when they encounter a financially stressful event. Finally, a family member's disability, including the type of disability, may also increase the FS of households by increasing their demand for resources. Ryan (2012) finds that age, employment and household income are positively associated with financial wellbeing while individuals with long-term health conditions report lower levels of financial wellbeing. Becoming a single parent and separating from a spouse has also negative effects on financial wellbeing. Phillips & Nepal (2012) find that even apart from income, employment status matters. Unemployed households suffer from a much higher rate of FS compared to their employed counterparts.

---

<sup>4</sup>Breunig & Cobb-Clark (2006) find net worth to be an important determinant of household financial stress. HILDA collects wealth data in wave 14 but this is not available in NATSISS, 2014-15. We use the home ownership status of the household as a proxy to the household's net worth and ability to access credit in our models of financial stress.

A large strain of the literature has focused on the relationship between expenditure on housing (or ‘mortgage stress’) and overall financial stress. [Yates \(2007\)](#) finds that spending a higher proportion of income on housing may increase the incidence of FS. [La Cava & Simon \(2005\)](#) find that the probability of a household being financially constrained is significantly affected by age, home ownership, income, and the income share of mortgage repayments. [Read et al. \(2014\)](#) find that households with relatively high debt-servicing ratios are more likely to miss mortgage payments.

[Marks \(2007\)](#) is the only other paper that we are aware of that has looked specifically at Indigenous households and financial stress. He finds that Indigenous status is strongly associated with increased odds of being in subjective poverty and FS. However, in his study, the contribution of Indigenous status disappears when education and marital status are taken into account. There is a large literature on Indigenous poverty and disadvantage. [Hall & Patrinos \(2012\)](#) show that Indigenous people are often the poorest of the poor in terms of income. [Kowal et al. \(2007\)](#) demonstrate the widespread socio-economic and health disadvantages experienced by Indigenous Australians. [Kendall \(2001\)](#) shows that the level of socio-economic outcomes for Aboriginal Canadians resemble those of poor people in developing countries more than non-aboriginal Canadians. The Canadian literature is quite extensive. The paper by [Power \(2008\)](#) is noteworthy as she shows that conceptualisations of food security that were developed in non-Aboriginal contexts perform poorly in Aboriginal contexts. There are unique food security considerations for Aboriginal people related to harvesting, sharing and consumption of country or traditional foods. Our results point to something similar in Australia with respect to FS.<sup>5</sup>

[Breunig & Cobb-Clark \(2006\)](#) outline a model of financial stress that may allow us to make some inferences about how ‘poverty’ broadly defined is measured using equivalence scales. Their approach is to parsimoniously model the factors that determine household FS. Using a probit model, they control for determinants such as income, household size, children, geographic location and home ownership. Then, they compute equivalence scales by solving for the amount of household income that produces equivalent levels of financial stress for different household types. While we consider different variables, our approach to building equivalence scales follows theirs.

---

<sup>5</sup>Financial stress is of interest in its own right but also because of its relationship to other problems. Financial stress can lead to depression and psychological distress—[Gyamfi et al. \(2001\)](#) and [Hughes et al. \(2014\)](#). These are linked to the development of chronic disease ([Paradies \(2006\)](#) and [Wingert \(2011\)](#)).



We use this previous research to inform the variables which we consider in our model of financial stress. We next turn to describing the two data sets that we use.

### 3. DATA

We use the Household Income and Labour Dynamics in Australia (HILDA) survey, a nationally representative panel survey of Australian households which, starting from 2001, collects data related to financial, socio-economic and financial stress issues. HILDA is recognised as a good source of data about financial stress.<sup>6</sup> While Indigenous Australians are slightly over-represented in HILDA relative to the population, the sample of Indigenous Australians is relatively small (Table 1).

[Table 1]

We use HILDA to study non-Indigenous Australians. In our analysis, we create a non-Indigenous sub-sample by dropping the 272 wave 14 households who contain at least one individual who self-identifies as Aboriginal or Torres Strait Islander.

To study Indigenous Australians, we use the 2014-15 National Aboriginal and Torres Strait Islander Social Survey (NATSISS). NATSISS is a useful source of information about Indigenous Australians on a range of demographic, social, environmental and economic issues, including financial stress. The survey allows us to conduct analysis on the financial stress of Indigenous Australians using a large, Indigenous-specific sample. An important connection between 2014-15 NATSISS and wave 14 of HILDA is that both include similar questions on financial stress and collect a similar set of socio-economic data. Furthermore, the surveys were conducted at a similar time.<sup>7</sup> As a result, the data can be used to examine differences in financial stress between the Indigenous and non-Indigenous populations without confounding macro-economic effects.

In our paper we follow [Breunig & Cobb-Clark \(2006\)](#) and conduct three indicator (0,1) measures of FS which we have labelled ‘cashflow’, ‘hardship’ and ‘any financial stress’. In HILDA, respondents over the age of 15 are asked to fill out a self-completion questionnaire (SCQ). They are asked whether

---

<sup>6</sup>[La Cava & Simon \(2003\)](#) and others after them found that reports of financial stress were higher in HILDA than in other Australian Bureau of Statistics collections. This seems most likely due to mode effects.

<sup>7</sup>NATSISS 2014-15 was conducted from September 2014 to June 2015 while the annual interviews for the main sample in HILDA commence towards the end of July each year and conclude by mid-February of the following year ([ABS, 2017](#); [Wilkins, 2016](#)).

or not, over the last 12 months, any of the following happened to them because of a shortage of money: inability to pay bills on time; inability to pay the mortgage or rent on time; pawning or selling something; asking for financial help from family or friends; asking for help from welfare or community organizations; an inability to heat the home; and missing meals. The ‘cashflow’ variable is coded as 1 if respondents indicated that they had cashflow problems (inability to pay rent/mortgage; inability to pay utilities; and borrowing from friends). The ‘hardship’ variable is coded as 1 if respondents experienced financial hardship (as measured by missing meals, pawning something, inability to heat the home and applying for welfare). The ‘any stress’ variable is equal to 1 if the individual responded in the affirmative to at least one of the FS indicators in the questionnaire.

For NATSISS, we constructed analogous measures of financial stress relying on the response categories that were similar to HILDA.<sup>8</sup> The NATSISS data includes some additional FS-related variables such as short-term loans, inability to pay car registration or insurance, inability to pay the minimum on the credit card and a few other items (see Appendix A). Using this additional data, we construct an ‘extended NATSISS’ financial stress indicator variable.<sup>9</sup> Cashflow difficulties are extended to include inability to pay for car registration or insurance, inability to make the minimum credit card repayment, taking out a short-term loan or giving someone access to your keycard because you didn’t have enough money. Hardship difficulties are extended to include a household member having lived without basic living items in the last 12 months.

For our non-Indigenous sample, we want to focus on non-remote families that are living in single-family households. Remoteness is rare in HILDA (about one per cent of households) since the sample was originally chosen from a frame that excluded remote households. Only households that subsequently moved to remote areas appear in HILDA. Multi-family households are also fairly rare, again just over one per cent of households have more than one family living together in them. For our non-Indigenous/HILDA sample we exclude these two groups. We also drop 1,525

---

<sup>8</sup>All household members are asked about household FS in HILDA. NATSISS only collects information about household FS from one member of the household. In order to make our analysis comparable, we use the response of one person from each household in the HILDA data. We order by person number within the household and take the first individual. We checked our results by taking the second respondent in each household rather than the first and the results are roughly the same. These results are available from the authors. [Breunig et al. \(2007\)](#) document the large amount of disagreement within households about financial stress events. Setting FS equal to one if any member of the household reports FS would bias the HILDA measure upwards relative to NATSISS.

<sup>9</sup>The questions in the two surveys are similar but not exactly identical. A comparison of the questions and data items from HILDA 2014 and NATSISS 2014-15 data is provided in Appendix-A.

observations where either FS or one of the independent variables in our model is missing. The vast majority of these deletions are caused by missing FS. The SCQ has a lower response rate than the main questionnaire and since FS is asked in the SCQ, we lose many observations from failure to return/answer the SCQ. As indicated above, we drop all households that have at least one Indigenous member. We drop 125 households in remote areas and 103 multi-family households. Our final sample size for HILDA is 7,600.

Remoteness and multi-family households are much more common in Indigenous households. In our NATSISS data, 16 per cent of households are located in remote areas and 8 per cent contain more than one family. One way that we will explore the role of remoteness and multi-family households in FS is by comparing a NATSISS sub-sample with the same exclusions as our HILDA sample to the full NATSISS data which includes remote and multi-family households.

For this sub-sample, we drop remote and multi-family households from NATSISS.<sup>10</sup> Starting with 6,611 observations, we exclude 1,494 observations which contain missing values for FS or any of the independent variables. We further drop 2,091 remote and 184 multi-family households to get our analysis sample of size 2,842. Summary statistics of the baseline definition of FS (based upon those variables available in both data sets) are presented for the HILDA sample, the non-remote/non-multi family NATSISS sample and the full NATSISS sample in columns 1-3 of Table 3, respectively. Columns 4 and 5 show average levels of FS based upon the extended definition using the additional questions available in NATSISS.

Comparison between the columns shows that, compared to non-Indigenous households, Indigenous households suffer from a significantly higher incidence of FS. Comparing column (1) to column (2), we can see that for non-remote, non-multi-family households, Indigenous Australians are roughly twice as likely to report FS as non-Indigenous households. These differences are statistically significant. When we look at the Indigenous sample which includes remote households and multi-family households, we actually see slightly lower FS (compared to non-remote and non-multi-family Indigenous households). Remoteness and multi-family households may offer some protective advantages. Those living in their country in remote areas may be able to resort to traditional hunting and gathering practices to stave off FS. Multi-family households may offer more opportunity for

---

<sup>10</sup>NATSISS does include households with non-Indigenous members (39 per cent). These households are important in understanding Indigenous FS.

resource sharing and provide insurance for household members. A similar pattern holds for both our limited and extended definitions of FS.

Overall, the consistently higher incidence of FS for Indigenous Australians indicates the importance of Indigenous-specific factors underlying their FS as indicated in [Hunter et al. \(2004\)](#).

[Table 2]

If we compare levels of FS using the limited and extended versions, we find about 10 percentage point higher levels of financial difficulty using the extended measure. By this measure, almost half of Indigenous households experienced FS at some point during the year. In all cases, cashflow problems are about twice as prevalent as hardship difficulties.

Like previous studies we find financial stress measures to have a negative association with household income (Table 3). Financial stress generally has a positive association with household size with the exception of single households (Table 4). This pattern reflects the advantages that couple-headed households enjoy discussed above as well as the much lower average incomes of singles. Tables 3 and 4 demonstrate the importance of including income and household size in the models of financial stress and controlling for both of these factors simultaneously.

[Table 3,4]

Summary statistics for the independent variables which we use in our analysis are presented in Table 5. A comparison of columns 1 and 2 highlights the differences in household characteristics between Indigenous and non-Indigenous Australians. The most important difference is the substantially lower incomes of Indigenous households. In the HILDA sample the average weekly income is \$2,041 in 2014. In the full NATSIS sample it is \$1,292, or a gap of \$749. The data also show important differences in household size, number of children and home ownership. Indigenous households have more children and consequently larger size. In the HILDA data, 68 per cent of respondents either own or are purchasing their home. In the full NATSISS data the corresponding share is 29 per cent. HILDA households are much more likely to be partnered—64 per cent compared to 46 per cent in the full NATSISS sample. It is likely that all these factors contribute to higher financial stresses of Indigenous households. Disability is slightly higher in the non-Indigenous sample.

[Table 5]

Column three shows that 16 per cent of households are in remote areas and 7.9 per cent of households contains more than one family in the full NATSISS data. Half of all Indigenous households have at least one non-Indigenous member.

Next we turn to our models of the determinants of financial stress and the simple model we use to construct equivalence scales.

#### 4. FINANCIAL STRESS AND EQUIVALENCE SCALES

Following [Breunig & Cobb-Clark \(2006\)](#) and others, we model financial stress using logarithms of household income and household size. We include controls for: an indicator for outright home ownership, an indicator for having a mortgage, an indicator for the presence of children in the household, an indicator for couple-headed (married or de facto) households and an indicator for the presence of a disabled person (defined as disabled or with a long-term health condition) in the household. In the model for the full NATSISS sample, we also include an indicator for remoteness, an indicator for multi-family households and an indicator for the presence of non-Indigenous people in an Indigenous household. For each of these, we also interact the indicator with the natural log of income and with the natural log of household size.<sup>11</sup>

$$p_h^* = \beta_1 + \beta_2 \ln(y_h) + \beta_3 \ln(hs_h) + \alpha'_1 \mathbf{D}_h + \alpha'_2 \mathbf{D}_h \ln(y_h) + \alpha'_3 \mathbf{D}_h \ln(hs_h) + u_h, \quad (1)$$

where, for each household  $h$ ,  $p^*$  is the (unobserved) propensity to report financial stress,  $y$  is the household's weekly income and  $hs$  is the household size.  $\mathbf{D}$  is the vector of dummy variables described above.

We use logistic regression to estimate (1). Alternative functional forms provide similar results (probit or linear probability model); we only report the marginal effects from the logistic regression model.

The model of equation (1) may be useful for policy makers who wish to identify the presence of particular household characteristics as being associated with a higher or lower propensity to experience financial stress. For the construction of equivalence scales, however, a simpler model

---

<sup>11</sup>[Breunig & Cobb-Clark \(2006\)](#) find health and immigration status to be important in explaining the FS of Australian households. Unfortunately, we do not have comparable information on the health status of household members across the two surveys. Immigration is (almost always) inapplicable to the Indigenous population.

may be desirable. For the purpose of estimating equivalence scales, we estimate

$$p^* = \beta_1 + \beta_2 \ln(y) + \beta_3 \ln(hs). \quad (2)$$

In order to obtain the equivalence scale (ES) for a particular group of households, one needs to equate the propensity of FS in that group with that of the reference household. Following this methodology, we construct simple equivalence scales in our analysis, i.e., calculate ESs for a group which differs from the reference group with respect to the single characteristic of household size. This equating of propensities and using a reference household of size 1 provides an equivalence scale,  $e_s$ , for each household size ( $hs$ ):

$$e_s = (hs)^{\frac{-\hat{\beta}_3}{\beta_2}} \quad (3)$$

An alternative would be to estimate very complicated equivalence scales that compare, for example, three person households with children who own their own home to two person households with no children who do not own their own home. In reality, we usually want a simple correction for household size that equalises utility (or the propensity to experience financial stress) across households of different size. Such equivalence scales average across all of these other characteristics and do not control for the ways in which the distribution of other characteristics affect equivalence scales. This means that the equivalence scales that we construct (and any such equivalence scale) are very much dependent upon time period and the group of people for whom they are constructed. If the distribution of other characteristics which affect the propensity to experience financial stress is changing in ways that are correlated with household size, then the equivalence scales will also be changing over time.

## 5. RESULTS

We have separately identified the determinants of FS for Indigenous and non-Indigenous Australians using the NATSISS and HILDA data. Table 6 presents the marginal effects from the logistic regressions (from equation (1)) for the measures of financial stress defined earlier.<sup>12</sup> Financial

---

<sup>12</sup>Full regression results can be found in Appendix Table B.1. Given the interactions, the individual coefficient estimates are difficult to interpret so the marginal effects, averaged across all individuals in the sample, are more useful.

stress is negatively affected by household income and positively related to household size for all FS measures and all population subgroups.

[Table 6]

Home ownership and the presence of a couple are associated with lower FS. The effect of home ownership is much stronger for those who own their home outright but there is a protective effect even for those who are still paying off a mortgage. As discussed earlier, home ownership is reflecting assets which can be used to cushion financial difficulties and couple-headed households have advantages in organisation and within-household trading that contribute to lower FS.

The presence of children or disabled household members is associated with higher financial stress. The exception is for the hardship measure for the Indigenous sample where the effect of children is insignificant. Children and disabled individuals likely raise costs (both financial and organisational) for households without generating compensating income flows. These results overall conform to what has been found in both the Australian and international literatures.

Table 7 compares two samples of Indigenous households. We use the extended definitions of FS making use of the additional information in the NATSISS questionnaire. The first three columns of Table 7 use the non-remote and non-multi-family households from NATSISS. The last three columns estimate the model using the full NATSISS sample. In the last three columns, we include controls for multi-family households and living in a remote area.

The results are broadly similar across the two samples. Interestingly, living in a multi-family household is associated with higher financial stress (though only marginally significant). A priori, it is not clear what association we would expect to find. Multi-family households provide an additional insurance mechanism against financial difficulties, however they also provide more opportunity for “humberging” (unreasonable and excessive demands on extended family members) which has been identified as one source of financial stress for individuals in Indigenous communities. This latter effect would seem to be dominating here.

Living in a remote area is associated with lower financial stress, once we control for income. This could be evidence that traditional country food, hunting and gathering and other customary

activities could be helping Indigenous people to alleviate financial stress. This corresponds to anecdotal reports that such activities lead to lower difficulties with financial stress.<sup>13</sup>

[Table 7]

The other covariates generally provide the same picture as the analysis of Table 6. Home ownership is related to lower financial stress and the effect is stronger if the home is paid off. Again, this is consistent with assets helping to offset financial problems that might arise and preventing them from becoming financially stressful episodes.

We estimate equation (2) and form equivalent scales following equation (3). In Table 8, we present equivalence scales for non-Indigenous households (using the HILDA data).<sup>14</sup>

We can see from Table 8 that the amount of money required to equalise the probability of financial stress as household size grows is much larger than the amount required to equalise consumption. This is perhaps not surprising. FS is not just about consumption but about management and organisation. These are probably correlated with income. Thus, it seems that it takes a substantial amount of resources to offset these factors for households experiencing financial stress. It could also be that FS goes beyond simple consumption needs and as households grow, consumption desires become more complicated and fulfilling them creates more possibility of FS.

[Table 8]

Table 9 and 10 present results for Indigenous Australians, in Table 9 with the NATSISS sample that is comparable to HILDA and in Table 10 for the full NATSISS sample. We use the extended FS measures described above. ES for Indigenous households increases much more slowly with household size than for non-Indigenous Australians.

There are several reasons why this might be the case. We know that poor individuals are practiced at getting by with little. As household size grows, they are able to cope with fewer resources. It could also be that money income is less important in alleviating financial stress as

---

<sup>13</sup>For modelling FS, we explored the inclusion of a variable in the NATSISS questionnaire about fishing, hunting and gathering and the households living in the homeland. However this was almost perfectly correlated with remoteness so the effect of the two can not be separated.

<sup>14</sup>We show the widely-used OECD equivalence scales as a benchmark even though they are consumption-based. We report the average OECD equivalence scale for each household size in the sample. These vary slightly across Tables 8, 9 and 10 as the mix of children and adults varies across these samples.



household size grows for Indigenous Australians. They can perhaps turn to other activities such as hunting and gathering to help offset financial stress.

It could also be driven by a different sense of what constitutes FS for Indigenous and non-Indigenous households. However, we do see much higher reports of FS amongst Indigenous households. Nonetheless, there could be systematic differences in what the two groups assess as FS.

[Table 9, 10]

In Tables 11 through 13, we consider some special cases of equivalence scales for more complicated household comparisons. The tables consider cashflow, hardship and any difficulty, respectively, and use the extended FS definition from NATSISS.

[Table 11,12,13]

In panel A of Table 11, we present equivalence scales which compare different family types using the estimated model of equation (1) (results in Table B.2) for the cashflow measure. This allows us to create equivalence scales which depend upon a greater variety of characteristics than simply household size. We construct the equivalence scale by taking the probability of experiencing financial stress for a reference household based upon the estimated model of equation (1) with a particular level of income and solving for the amount of income that a comparison household would require to achieve the same propensity to experience financial stress.

We use a single-individual household with average income (for single individuals) from the data as the reference one-person household. We consider two-person households that are couple-headed and two-person households where the two individuals are not partners (row three—flagged as \*\*. ) For all households of size three or larger we treat them as couple-headed and as having children present. These are the most common values in the data.

For all households, we begin by considering households that are not home owners or buyers, that have no disabled members, that have no non-Indigenous members and that contain only one family. Looking at column two of Table 11, we can see that these produce a slightly smaller gradient of household income as household size increases. This reflects that couple-headedness confers advantages on avoiding financial stress. (Table 10 averages across couple-headed and non-couple headed households and thus produces steeper equivalence scales.) In row three, when we

consider a two-person household that is not couple-headed (but in which there are no children) we see that the equivalence scale is substantially higher.

In columns three through five of Panel A of Table 11, we examine additional characteristics that we consider one-by-one in the equivalence scale estimates. In each case, we consider households of all sizes to have this characteristic. The one exception is the presence of a non-Indigenous member, where for a household of size one, the data construction requires that this person be Indigenous since there are no entirely non-Indigenous households in our sample.

Disability, in addition to producing higher financial stress, also increases the gradient of the equivalence scale. This is through the interaction of disability with income and household size. Larger households need more resources and this is more true when a disabled person is present in the household.

The presence of a non-Indigenous member, in contrast, greatly flattens the equivalence scale. The presence of a non-Indigenous member is highly correlated with less FS. This is consistent with anthropological evidence that the presence of non-Indigenous householders lessens financial pressures from ‘demand-sharing’; see [Peterson & Taylor \(2003\)](#). So a partnered couple where one of the members is Indigenous only requires two-thirds the income of a single Indigenous individual to be at the same probability level of experiencing FS.

Remoteness, while lowering the probability of FS (conditional on other characteristics), does not affect the gradient of the equivalence scale with respect to household size.

In Panel B of table 11, we consider equivalence scales where we compare households that have a particular characteristic (disability, a non-Indigenous member, remoteness) to an otherwise identical household that does not have that characteristic.

Columns three through five present these results. A disabled single person requires 211 per cent more income than a non-disabled single person to achieve the same probability of avoiding financial stress. For a three person household with a disabled member, this number climbs to 318 per cent. It is between these two extremes for households of other sizes.

The presence of a non-Indigenous member results in households needing only 43 to 87 per cent of the income of otherwise identical households. Remoteness also results in households needing only around half as much income to achieve an equal probability of avoiding FS.

Tables 12 and 13 provide similar results for the measures of hardship and any FS. What is striking in both panels of Table 12 is the very strong relationship between disability and hardship. The additional resources needed by families to cope with disability as household size grows are very substantial. A household with 4 people for example, needs 4.72 times more money income to be at the same level of hardship propensity as a household of 4 with no disabled person present.

With remote households, we again find a fairly flat gradient in the equivalence scales as household size increases. Remote households need only about half as much money, at any household size, to be at the same level of hardship probability as non-remote households. This strongly highlights the coping mechanisms that remote Indigenous households employ despite their low incomes.

## 6. CONCLUSION AND DISCUSSION

There are many conceptual complexities underlying Indigenous financial stress or poverty that are not adequately captured in mainstream poverty analysis ([Altman & Hunter, 1998](#); [Hunter, 2013](#)). A credible analysis of either phenomenon must acknowledge both the diversity of Indigenous circumstances and how distinct value systems drive preferences and behaviours that shape the ability of policy to address Indigenous disadvantage. Analysis needs to take into account, and be informed by, specific social and cultural circumstances facing Indigenous Australians.

[Hunter \(2013\)](#) argues that Indigenous-specific equivalence scales are required to take into account the distinct costs associated with running Indigenous households and associated financial stress. This paper estimates models of the determinants of financial stress and uses them to estimate equivalence scales which are based upon equating the propensity to experience financial stress across households of different sizes and different types.

We demonstrate that while the determinants of financial stress are in fact quite similar for Indigenous and non-Indigenous Australians, the level of financial stress is much higher for Indigenous households.

The equivalence scales that we estimate are also quite different for Indigenous and non-Indigenous households. Indigenous households appear to have better coping strategies to avoid financial stress as household size increases. This is reflected in equivalence scales which increase more slowly with household size compared to non-Indigenous households. This partially seems related to remoteness

which leads us to conclude that hunting and gathering and traditional food sourcing activities may be playing an important role in mitigating money income disadvantage.

Our results generally highlight the importance of taking into account the specific circumstances of Indigenous Australians. In particular, we show that equivalence scales derived for non-Indigenous groups are likely to be inadequate for analysing Indigenous households. This points to a need for further work on equivalence scales—particularly the need for an Indigenous-specific consumption-based equivalence scale. It should be a matter of some priority to include an Indigenous identifier on future household expenditure surveys.

To the extent that recent income management policies are motivated by a concern about how Indigenous households manage money, cashflow and hardship, the above analysis of equivalence indicates that such concerns may be at least somewhat misplaced. Indigenous households, perhaps through Indigenous cultural practices, are managing their resources even better than many non-Indigenous households (especially when the focus is on very large households). This is not to say that Indigenous financial arrangements can not be improved, but policy should focus on the first order issues of improving income and access to money.

[Altman & Biddle \(2014\)](#) document the historical root of much Indigenous disadvantage, including the fact that educational and labour market outcomes lag well behind those of other Australians. Indigenous people have high income from government payments, but particularly low wages and other income, including from investments and assets ([Howlett et al. \(2016\)](#)). This limits income, but may also constrain the ability of Indigenous households to secure loans for investment and business opportunities. Therefore the apparently better management of cashflow, evident in the equivalence scales for large Indigenous households may partially reflect historically poor economic outcomes. Policy needs to address Indigenous access to both the capital and the labour markets.

The high levels of financial stress amongst Indigenous households require a policy response. Some help may be had through better financial literacy. Some basic financial literacy skills could be incorporated within the compulsory education system (e.g. secondary schools). Provision of financial infrastructure and banking services, especially if delivered in a culturally accessible and appropriate manner, could also play a role in reducing Indigenous financial stress; see [Godinho \(2015\)](#). Any policy response needs rigorous quantitative evaluation supported by high-quality data.

## TABLES AND FIGURES

TABLE 1: **Final sample composition of households, HILDA 2014 data**

Household type	Freq.	Percent
No member of indigenous origin	9,266	97.15
Members includes aboriginal/Torres strait islander	272	2.85
Total	9,538	100.00

*Note:* Indigenous population is slightly overrepresented in the sample.

TABLE 2: **Summary Statistics -dependent variables**

	NATSISS				
	HILDA (1)	Comparable (with HILDA) definition of FS		Extended NATSISS definition of FS	
		Non-remote and non-multifamily (2)	Full sample (3)	Non-remote and non-multifamily (4)	Full sample (5)
Cashflow	0.179 (0.006)	0.396 (0.009)	0.393 (0.007)	0.492 (0.009)	0.485 (0.007)
Hardship	0.096 (0.005)	0.189 (0.007)	0.182 (0.005)	0.276 (0.008)	0.269 (0.006)
Any stress	0.207 (0.007)	0.430 (0.009)	0.426 (0.007)	0.503 (0.009)	0.496 (0.007)
N	7,600	2,842	5,117	2,842	5,117

*Notes:*

1. Standard errors, reported in the parentheses, are estimated using replicate weights through Jackknife method.
2. The ‘comparable (with HILDA) definition’ uses the same definitions as HILDA while the ‘extended NATSISS definition’ uses extended definitions of FS, based on some information which are only available in NATSISS data.
3. Column 3 reports summary statistics using the sample used in column 2, which restricts the NATSISS sample to non-remote and one-family households.
4. Summary statistics presented in column 4 additionally include remote and multifamily households.

TABLE 3: **Financial stress at quintiles of household income - means**

	HILDA income quintiles			
	1	2	3	4 & 5
<u>HILDA</u>				
Cashflow	0.229 (0.013)	0.245 (0.017)	0.203 (0.013)	0.109 (0.008)
Hardship	0.184 (0.012)	0.139 (0.011)	0.094 (0.012)	0.032 (0.004)
Any stress	0.288 (0.013)	0.272 (0.018)	0.231 (0.015)	0.122 (0.008)
NATSISS Non-remote and non-multifamily households (with Comparable (with HILDA) definition of FS)				
Cashflow	0.473 (0.015)	0.450 (0.018)	0.341 (0.021)	0.204 (0.019)
Hardship	0.290 (0.014)	0.212 (0.015)	0.115 (0.014)	0.025 (0.007)
Any stress	0.519 (0.015)	0.486 (0.018)	0.373 (0.021)	0.214 (0.020)
NATSISS Non-remote and non-multifamily households (with Extended NATSISS definition of FS)				
Cashflow (extended)	0.596 (0.015)	0.538 (0.018)	0.416 (0.022)	0.284 (0.022)
Hardship (extended)	0.396 (0.015)	0.303 (0.016)	0.170 (0.017)	0.098 (0.014)
Any stress (extended)	0.607 (0.015)	0.553 (0.018)	0.427 (0.022)	0.284 (0.022)
NATSISS full sample (with Extended NATSISS definition of FS)				
Cashflow (extended)	0.582 (0.011)	0.526 (0.013)	0.419 (0.017)	0.295 (0.017)
Hardship (extended)	0.372 (0.011)	0.295 (0.012)	0.176 (0.013)	0.119 (0.012)
Any stress (extended)	0.596 (0.011)	0.539 (0.013)	0.429 (0.017)	0.296 (0.017)

*Note:* 1. Standard errors, reported in the parentheses, are estimated using replicate weights through Jackknife method.

2. NATSISS means are generated using income quintiles of HILDA to make it comparable with non-Indigenous Australians.

TABLE 4: Financial stress at different household sizes - means

	Household size					
	1	2	3	4	5	6+
<u>HILDA</u>						
Cashflow	0.188 (0.011)	0.140 (0.008)	0.206 (0.015)	0.185 (0.023)	0.208 (0.021)	0.289 (0.035)
Hardship	0.131 (0.009)	0.069 (0.005)	0.100 (0.009)	0.081 (0.008)	0.092 (0.017)	0.212 (0.074)
Any stress	0.229 (0.011)	0.165 (0.009)	0.232 (0.014)	0.200 (0.022)	0.219 (0.022)	0.377 (0.065)
<u>NATSISS Non-remote and non-multifamily households (with Comparable (with HILDA) definition of FS)</u>						
Cashflow	0.394 (0.020)	0.298 (0.016)	0.435 (0.022)	0.443 (0.023)	0.453 (0.030)	0.531 (0.040)
Hardship	0.283 (0.018)	0.153 (0.012)	0.154 (0.016)	0.170 (0.018)	0.184 (0.024)	0.230 (0.033)
Any stress	0.445 (0.020)	0.323 (0.016)	0.458 (0.022)	0.472 (0.024)	0.498 (0.031)	0.593 (0.039)
<u>NATSISS Non-remote and non-multifamily households (with Extended NATSISS definition of FS)</u>						
Cashflow (extended)	0.548 (0.020)	0.402 (0.017)	0.513 (0.022)	0.481 (0.024)	0.518 (0.031)	0.668 (0.037)
Hardship (extended)	0.367 (0.020)	0.240 (0.015)	0.253 (0.019)	0.262 (0.021)	0.225 (0.026)	0.345 (0.038)
Any stress (extended)	0.555 (0.020)	0.410 (0.017)	0.522 (0.022)	0.498 (0.024)	0.536 (0.030)	0.677 (0.037)
<u>NATSISS full sample (with Extended NATSISS definition of FS)</u>						
Cashflow (extended)	0.526 (0.016)	0.402 (0.014)	0.519 (0.017)	0.482 (0.018)	0.497 (0.021)	0.603 (0.021)
Hardship (extended)	0.346 (0.015)	0.232 (0.012)	0.277 (0.015)	0.254 (0.015)	0.219 (0.017)	0.299 (0.019)
Any stress (extended)	0.537 (0.016)	0.411 (0.014)	0.528 (0.017)	0.496 (0.018)	0.517 (0.021)	0.609 (0.020)

*Note:* 1. Standard errors, reported in the parentheses, are estimated using replicate weights through Jackknife method.

TABLE 5: Summary statistics - independent variables

	HILDA (1)	NATSISS	
		Excluding remote and multifamily households (2)	Full sample (3)
Weekly income	2,042 (30)	1,275 (18)	1,292 (14)
Household size	2.640 (0.016)	2.838 (0.027)	2.918 (0.021)
Household with children	0.264 (0.004)	0.478 (0.009)	0.468 (0.007)
Number of children	0.472 (0.009)	0.948 (0.023)	0.934 (0.017)
Owner without a mortgage	0.337 (0.008)	0.094 (0.005)	0.091 (0.004)
Owner with a mortgage	0.343 (0.008)	0.218 (0.008)	0.197 (0.006)
Partnered	0.637 (0.004)	0.483 (0.009)	0.460 (0.007)
Disabled member	0.376 (0.007)	0.353 (0.009)	0.339 (0.007)
Household has a non-Indigenous member	n\	0.548 (0.009)	0.507 (0.007)
Multi-family households	n\	n\	0.079 (0.004)
Remote household	n\	n\	0.159 (0.005)

*Note:* 1. 'Weekly income' in our analysis refers to weekly income of households.

2. Standard errors, reported in parentheses, are estimated using replicate weights through Jackknife Method for HILDA data.



TABLE 6: Marginal effects on the propensity of financial stress - Indigenous Vs. non-Indigenous Australians

	HILDA			NATSISS		
	Cashflow (1)	Hardship (2)	Any Stress (3)	Cashflow (4)	Hardship (5)	Any Stress (6)
Log(income)	-0.109*** (0.009)	-0.072*** (0.006)	-0.132*** (0.009)	-0.097*** (0.019)	-0.097*** (0.014)	-0.112*** (0.019)
Log(household size)	0.102*** (0.016)	0.057*** (0.010)	0.108*** (0.017)	0.122*** (0.036)	0.029 (0.026)	0.145*** (0.037)
Owner without a mortgage	-0.235*** (0.011)	-0.101*** (0.008)	-0.263*** (0.012)	-0.304*** (0.023)	-0.132*** (0.015)	-0.323*** (0.024)
Owner with a mortgage	-0.076*** (0.010)	-0.032*** (0.007)	-0.087*** (0.011)	-0.139*** (0.025)	-0.104*** (0.015)	-0.153*** (0.026)
Household with children	0.091*** (0.026)	0.028* (0.016)	0.104*** (0.029)	0.099*** (0.032)	0.037 (0.023)	0.090*** (0.033)
Partnered	-0.081*** (0.014)	-0.071*** (0.010)	-0.094*** (0.015)	-0.116*** (0.027)	-0.060*** (0.019)	-0.134*** (0.027)
Disabled member	0.046*** (0.011)	0.052*** (0.008)	0.063*** (0.012)	0.072*** (0.021)	0.089*** (0.017)	0.092*** (0.022)
N	7,600	7,600	7,600	2,842	2,842	2,842

Note: 1. Regressions with NATSISS sample, which only include non-remote and non-multifamily households, use a definition of FS which is comparable with HILDA.

2. Standard errors are reported in parentheses.

3. Marginal effects (using linear prediction, at the means of other covariates) are reported. For detailed results, see Table B.1.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

TABLE 7: Marginal effects on the propensity of financial stress for Indigenous Australians  
(with Extended definition and NATSISS data)

	Excludes remote & multifamily			Full Sample		
	Cashflow (1)	Hardship (2)	Any stress (3)	Cashflow (4)	Hardship (5)	Any stress (6)
Log(income)	-0.110*** (0.019)	-0.122*** (0.016)	-0.122*** (0.019)	-0.120*** (0.014)	-0.125*** (0.012)	-0.131*** (0.014)
Log(household size)	0.139*** (0.038)	0.072*** (0.032)	0.150*** (0.038)	0.144** (0.026)	0.087*** (0.022)	0.150*** (0.027)
Owner without a mortgage	-0.354*** (0.025)	-0.184*** (0.018)	-0.361*** (0.025)	-0.309*** (0.023)	-0.173*** (0.016)	-0.314*** (0.023)
Owner with a mortgage	-0.175*** (0.027)	-0.120*** (0.019)	-0.177*** (0.027)	-0.165*** (0.024)	-0.120*** (0.016)	-0.165*** (0.024)
Household with children	0.054 (0.034)	0.043 (0.027)	0.058* (0.034)	0.014 (0.024)	0.002 (0.020)	0.018 (0.024)
Partnered	-0.092*** (0.036)	-0.089*** (0.029)	-0.110*** (0.036)	-0.036* (0.022)	-0.041** (0.018)	-0.048** (0.022)
Disabled member	0.077*** (0.022)	0.126*** (0.019)	0.087*** (0.023)	0.075*** (0.017)	0.120*** (0.015)	0.083*** (0.017)
Household has a non-Indigenous member	-0.057 (0.034)	0.003 (0.028)	-0.044 (0.035)	-0.095*** (0.023)	-0.043** (0.019)	-0.089*** (0.023)
Multi-family household	n\ a	n\ a	n\ a	0.059 (0.046)	0.069* (0.041)	0.063 (0.046)
Remote Household	n\ a	n\ a	n\ a	-0.076*** (0.018)	-0.091*** (0.015)	-0.075*** (0.018)

Note: 1. Standard errors are reported in parentheses.

2. Marginal effects (using linear prediction, at the means of other covariates) are reported. For detailed results, see Table B.2.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

TABLE 8: **Equivalence scales for non-Indigenous Australians**  
**(Excluding remote and multifamily household)**

Household size	OECD Equivalence scale	Cashflow	Hardship	Any stress
1	1.00	1.00	1.00	1.00
2	1.49	2.16	1.69	1.92
3	1.89	3.40	2.29	2.80
4	2.25	4.68	2.85	3.67
5	2.63	5.99	3.37	4.52
6	2.96	7.34	3.87	5.37

TABLE 9: **Equivalence scales for Indigenous Australians**  
**(Excluding remote and multifamily household and using extended FS measure)**

Household size	OECD Equivalence scale	Cashflow	Hardship	Any stress
1	1.00	1.00	1.00	1.00
2	1.45	1.64	1.41	1.65
3	1.82	2.19	1.73	2.20
4	2.15	2.69	1.99	2.71
5	2.47	3.16	2.23	3.18
6	2.73	3.60	2.44	3.63

TABLE 10: **Equivalence scales for Indigenous Australians**  
**(Including remote and multifamily household and using extended FS measure)**

Household size	OECD Equivalence scale	Cashflow	Hardship	Any stress
1	1.00	1.00	1.00	1.00
2	1.46	1.71	1.34	1.68
3	1.83	2.33	1.59	2.28
4	2.18	2.92	1.80	2.83
5	2.53	3.46	1.97	3.34
6	2.83	3.99	2.13	3.83

TABLE 11: **Equivalence scales for different types of Indigenous Australians:  
Cashflow measure of financial stress\***

Household size	Reference household	Disabled member	Non-Indigenous member	Remote household
<u>Panel A: Relative to reference household of size 1</u>				
1	1.00	1.00	1.00	1.00
2	1.25	1.48	0.67	1.36
2**	2.41	4.16	0.83	2.22
3	2.31	3.27	1.31	2.35
4	2.72	4.18	1.76	2.82
5	3.10	5.04	2.21	3.25
6	3.44	5.89	2.67	3.65
<u>Panel B: Relative to same sized reference household</u>				
1		2.11	n/a	0.49
2		2.89	0.43	0.48
3		3.18	0.55	0.51
4		2.24	0.64	0.52
5		2.25	0.76	0.55
6		2.20	0.87	0.56

*Note:* 1. Reference households are non-homeowners, non-multi-family. Households with two or more people are couple-headed except where indicated. Households with three or more people have children present.

\* Includes remote and multifamily household and use extended financial stress definition.

\*\* Two individuals in household but not couple-headed.

TABLE 12: **Equivalence scales for different types of Indigenous Australians:  
Hardship measure of financial stress\***

Household size	Reference household	Disabled member	Non-Indigenous member	Remote household
<u>Panel A: Relative to reference household of size 1</u>				
1	1.00	1.00	1.00	1.00
2	1.22	1.56	0.87	1.15
2**	1.61	2.39	1.04	1.49
3	2.85	8.30	1.92	2.40
4	2.81	9.00	2.38	2.30
5	2.77	9.58	2.81	2.22
6	2.74	10.08	3.22	2.17
<u>Panel B: Relative to same sized reference household</u>				
1		2.27	n/a	0.56
2		3.59	0.62	0.51
3		4.18	0.78	0.49
4		4.72	0.90	0.48
5		4.98	1.04	0.47
6		5.25	1.16	0.47

*Note:* 1. Reference households are non-homeowners, non-multi-family. Households with two or more people are couple-headed except where indicated. Households with three or more people have children present.

\* Includes remote and multifamily household and use extended financial stress definition.

\*\* Two individuals in household but not couple-headed.

TABLE 13: **Equivalence scales for different types of Indigenous Australians:  
Any stress measure of financial stress\***

Household size	Reference household	Disabled member	Non-Indigenous member	Remote household
<u>Panel A: Relative to reference household of size 1</u>				
1	1.00	1.00	1.00	1.00
2	1.10	1.37	0.65	1.20
2**	2.37	3.43	0.89	2.11
3	2.20	3.13	1.32	2.16
4	2.62	4.09	1.79	2.58
5	3.01	5.03	2.26	2.97
6	3.37	5.96	2.73	3.33
<u>Panel B: Relative to same sized reference household</u>				
1		2.02	n/a	0.51
2		2.73	0.44	0.48
3		3.14	0.56	0.49
4		3.49	0.66	0.50
5		3.73	0.79	0.52
6		3.95	0.90	0.53

*Note:* 1. Reference households are non-homeowners, non-multi-family. Households with two or more people are couple-headed except where indicated. Households with three or more people have children present.

\* Includes remote and multifamily household and use extended financial stress definition.

\*\* Two individuals in household but not couple-headed.

## REFERENCES

- ABS (2017). 4714.0 - National Aboriginal and Torres Strait Islander Social Survey, 2014-15. web resources, Australian Bureau of Statistics, Canberra. Available from: <https://goo.gl/GHFbpL> [Accessed: 03 Nov. 2017].
- Altman, J. C., & Biddle, N. (2014). Refiguring Indigenous economies: A 21st-century perspective. In S. Ville, & G. Withers (Eds.) *The Cambridge Economic History of Australia*, (pp. 30–55). Cambridge University Press, Cambridge.
- Altman, J. C., & Hunter, B. H. (1998). Indigenous poverty. In R. Fincher, & J. P. Nieuwenhuysen (Eds.) *Australian Poverty: Then and Now*, (pp. 238–257). Melbourne University Press, Melbourne.
- Australian Government (2009). Closing the gap on Indigenous disadvantage: The challenge for Australia. Report, Families, Housing, Community Services and Indigenous Affairs, Australian Government. Available from: <https://goo.gl/evnPvw> [Accessed: 22 Nov. 2017].
- Bray, J. R. (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. Available from: <https://goo.gl/rF8n6s> [Accessed: 01 Nov. 2017].
- Breunig, R., & Cobb-Clark, D. (2006). Understanding the factors associated with financial stress in Australian households. *Australian Social Policy, 2005*, 13–64.
- Breunig, R., Cobb-Clark, D., Gong, X., & Venn, D. (2007). Disagreement in Australian partners' reports of financial difficulty. *Review of Economics of the Household, 5*(1), 59–82.
- Cobb-Clark, D. A., & Ribar, D. C. (2012). Financial stress, family relationships, and Australian youths' transitions from home and school. *Review of Economics of the Household, 10*(4), 469–490.
- Daly, A., & Smith, D. (2002). Reforming Indigenous welfare policy: Salutary lessons and future challenges for Australia from the US experience. CAEPR working paper No. 241, The Australian National University, Canberra.
- Deaton, A., & Muellbauer, J. (1980). *Economics and Consumer Behavior*. Cambridge University Press, Cambridge, UK.
- Ducpétiaux, E. (1855). *Budgets économiques des classes ouvrières en Belgique, Brussels*. M. Hayez imp. de la Commission Centrale de Statistique.
- Engel, E. (1857). Die productions-und consumtionsverhältnisse des königreichs sachsen. *Zeitschrift des Statistischen Bureaus des Königlich Sächsischen Ministeriums des Innern, 8*, 1–54.

- Ferguson, M., Ódea, K., Chatfield, M., Moodie, M., Altman, J., & Brimblecombe, J. (2016). The comparative cost of food and beverages at remote Indigenous communities, Northern Territory, Australia. *Australian and New Zealand Journal of Public Health*, 40(S1).
- Godinho, V. (2015). Money, Financial Capability and Well-being in Indigenous Australia. Unpublished PhD thesis. RMIT University, Melbourne.
- Gyamfi, P., Brooks-Gunn, J., & Jackson, A. P. (2001). Associations between employment and financial and parental stress in low-income single black mothers. *Women & Health*, 32(1-2), 119–135.
- Hall, G. H., & Patrinos, H. A. (2012). *Indigenous peoples, poverty, and development*. Cambridge University Press. Available from: <https://goo.gl/uPBZ4X> [Accessed: 22 Nov. 2017].
- Henderson, R. F. (1975). Commission of inquiry into poverty: Poverty in Australia. First Main Report, Canberra, Australian Government Publishing Service. Available from: <https://goo.gl/8RM9k7> [Accessed: 01 Nov. 2017].
- Howlett, M., Gray, M., & Hunter, B. (2016). Wages, government payments and other income of Indigenous and non-Indigenous Australians. *Australian Journal of Labour Economics*, 19(2), 53–76.
- Hughes, M., Kiecolt, K. J., & Keith, V. M. (2014). How racial identity moderates the impact of financial stress on mental health among African Americans. *Society and Mental Health*, 4(1), 38–54.
- Hunter, B. (2013). Is Indigenous poverty different from other poverty? In B. Hunter, & N. Biddle (Eds.) *Survey Analysis for Indigenous Policy in Australia: Social Sciences Perspectives*. ANU E-Press, Canberra.
- Hunter, B. H., Kennedy, S., & Biddle, N. (2004). Indigenous and other Australian poverty: Revisiting the importance of equivalence scales. *Economic Record*, 80(251), 411–422.
- Hunter, B. H., Kennedy, S., & Smith, D. (2003). Household composition, equivalence scales and the reliability of income distributions: Some evidence for Indigenous and other Australians. *Economic Record*, 79(244), 70–83.
- Kendall, J. (2001). Circles of disadvantage: Aboriginal poverty and underdevelopment in Canada. *American Review of Canadian Studies*, 31(1-2), 43–59.
- Kowal, E., Gunthorpe, W., & Bailie, R. S. (2007). Measuring emotional and social wellbeing in Aboriginal and Torres Strait Islander populations: An analysis of a Negative Life Events Scale. *International Journal for Equity in Health*, 6(1), 18.



- La Cava, G., & Simon, J. (2003). A tale of two surveys: Household debt and financial constraints in Australia. Research discussion paper 2003-08, Reserve Bank of Australia, Sydney. Available from: <https://goo.gl/5Ncpzk> [Accessed: 30 Nov. 2017].
- La Cava, G., & Simon, J. (2005). Household debt and financial constraints in Australia. *Australian Economic Review*, 38(1), 40–60.
- Marks, G. N. (2007). Income poverty, subjective poverty and financial stress. Australian Government Social Policy Research Paper No. 29, Australian Government. Available from: <https://ssrn.com/abstract=1728587> [Accessed: 22 Nov. 2017].
- Paradies, Y. (2006). A review of psychosocial stress and chronic disease for 4th world Indigenous peoples and African Americans. *Ethnicity & Disease*, 16, 295–308.
- Peterson, N., & Taylor, J. (2003). The modernising of the Indigenous domestic moral economy: Kinship, accumulation and household composition. *The Asia Pacific Journal of Anthropology*, 4(1-2), 105–122.
- Phillips, M. B., & Nepal, B. (2012). Going without: Financial hardship in Australia. Report, The National Centre for Social and Economic Modelling (NATSEM), University of Canberra. Available from: <https://goo.gl/hY9EsT> [Accessed: 29 Nov. 2017].
- Power, E. M. (2008). Conceptualizing food security for Aboriginal people in Canada. *Canadian Journal of Public Health/Revue Canadienne De Santé Publique*, 99(2), 95–97.
- Read, M., Stewart, C., La Cava, G., et al. (2014). Mortgage-related financial difficulties: Evidence from Australian micro-level data. Research Discussion Paper 2014-13, Reserve Bank of Australia. Available from: <https://goo.gl/MrHKns> [Accessed: 29 Nov. 2017].
- Ryan, C. (2012). Responses to financial stress at life transition points. Occasional Paper No. 41, Department of Families, Housing, Community Services and Indigenous Affairs, Australian Government. Available from: <https://goo.gl/6L2cig> [Accessed: 29 Nov. 2017].
- Wilkins, R. (2016). The Household, Income and Labour Dynamics in Australia Survey: Selected Findings from Waves 1 to 14. Report, Melbourne Institute of Applied Economic and Social Research, The University of Melbourne. Available from: <https://goo.gl/gkKfRQ> [Accessed: 03 Nov. 2017].
- Wingert, S. (2011). The social distribution of distress and well-being in the Canadian aboriginal population living off reserve. *International Indigenous Policy Journal*, 2(1).
- Yates, J. (2007). Housing affordability and financial stress. Research Paper No. 6, Australian Housing and Urban Research Institute, Sydney Research Centre. Available from: <https://goo.gl/aTqEBc> [Accessed: 29 Nov. 2017].

## APPENDIX A: DATA NOTES: DEPENDENT VARIABLES

NATSISS 2014-15	HILDA 2014
<p>1. In the last 12 months (year) have any of these things happened to you (members of this household) because you (any of you) didn't have enough money? (More than one response allowed)</p> <ul style="list-style-type: none"> <li>• Couldn't pay electricity, gas or telephone bills on time</li> <li>• Couldn't pay mortgage or rent on time</li> <li>• Pawned or sold something to get money</li> <li>• Missed meals</li> <li>• Couldn't heat or cool your home</li> <li>• Asked for money from friends or family</li> <li>• Asked for help from welfare or community organisations</li> </ul>	<p>1. Since January 2014 did any of the following happen to you because of a shortage of money? (yes/no)</p> <ul style="list-style-type: none"> <li>a. Could not pay electricity, gas or telephone bills on time</li> <li>b. Could not pay the mortgage or rent on time</li> <li>c. Pawned or sold something</li> <li>d. Went without meals</li> <li>e. Was unable to heat home</li> <li>f. Asked for financial help from friends or family</li> <li>g. Asked for help from welfare/ community organisations</li> </ul>
Below here, items only available on NATSISS	
<ul style="list-style-type: none"> <li>• Used short term loans (e.g. personal loan)</li> <li>• Ran up a tab (book up) at the local store</li> <li>• Gave somebody else access to your key card</li> <li>• Couldn't pay car registration or insurance on time</li> <li>• Couldn't pay the minimum payment on your credit card</li> <li>• Anything else</li> <li>• No/None of these</li> <li>• Don't know</li> </ul>	n/a
<p>2. In the last &lt;12 months/year &gt;, how many times have &lt;you/members of this household &gt;&lt;experienced difficulty/had problems &gt;in paying bills?</p> <ul style="list-style-type: none"> <li>• Once</li> <li>• Twice</li> <li>• 3 - 5 times</li> <li>• 6 - 9 times</li> <li>• 10 - 19 times</li> <li>• 20 times or more</li> <li>• Don't know</li> </ul>	n/a
<p>3. In the last &lt;12 months/year&gt;were there any days when &lt;you/members of this household &gt;ran out of money for food, clothing or bills? (yes/no)</p>	n/a
<p>4. Did this happen in the last two weeks? (yes/no)</p>	n/a
<p>5. Did &lt;you members of this household &gt;have to go without food, clothing or put off paying bills (when &lt;you/they&gt;ran out of money)? (yes/no)</p>	n/a

## APPENDIX B: TABLES

TABLE B.1: Determinants of financial stress- Indigenous Vs. non-Indigenous Australians

	HILDA			NATSISS		
	Cashflow (1)	Hardship (2)	Any Stress (3)	Cashflow (4)	Hardship (5)	Any Stress (6)
Log(income)	-0.328*** (0.074)	-0.600*** (0.089)	-0.449*** (0.075)	-0.246* (0.147)	-0.544*** (0.189)	-0.292** (0.146)
Log(household size)	0.681*** (0.125)	0.829*** (0.151)	0.732*** (0.123)	0.347* (0.205)	-0.21 (0.262)	0.394* (0.204)
Owner without a mortgage	-0.418 (0.793)	-1.302 (0.935)	-0.873 (0.743)	-1.420 (1.855)	-2.674 (2.444)	-1.505 (1.771)
Log(income) × Owner without a mortgage	-0.224* (0.125)	-0.054 (0.150)	-0.152 (0.118)	-0.052 (0.0294)	0.192 (0.392)	-0.033 (0.281)
Log(household size) × Owner without a mortgage	0.057 (0.213)	0.039 (0.260)	0.017 (0.198)	0.040 (0.409)	-0.347 (0.560)	-0.027 (0.389)
Owner with a mortgage	2.660*** (0.858)	2.806*** (1.086)	2.373*** (0.848)	1.977 (1.264)	4.677** (1.916)	2.106* (1.256)
Log(income) × Owner with a mortgage	-0.414*** (0.123)	-0.419*** (0.159)	-0.375*** (0.121)	-0.400** (0.187)	-0.820*** (0.295)	-0.421** (0.186)
Log(household size) × Owner with a mortgage	-0.299** (0.147)	-0.317* (0.190)	-0.298** (0.143)	0.151 (0.231)	-0.079 (0.344)	0.127 (0.228)
Household with children	4.077*** (0.959)	4.185*** (1.192)	3.788*** (0.955)	1.211 (1.018)	-5.545 (1.303)	1.329 (1.020)
Log(income) × household with children	-0.465*** (0.135)	-0.533*** (0.174)	-0.417*** (0.133)	-0.075 (0.158)	0.066 (0.208)	-0.109 (0.158)
Log(household size) × household with children	-0.164 (0.265)	0.054 (0.324)	-0.236 (0.262)	-0.310 (0.272)	0.448 (0.340)	-0.231 (0.272)
Partnered	1.164* (0.700)	0.950 (0.880)	0.836 (0.678)	0.448 (1.069)	2.101 (1.427)	-0.053 (1.062)
Log(income) × Partnered	-0.264*** (0.102)	-0.274** (0.131)	-0.210** (0.099)	-0.226 (0.158)	-0.372* (0.216)	-0.154 (0.157)
Log(household size) × Partnered	0.266 (0.184)	0.182 (0.236)	0.169 (0.179)	0.677*** (0.238)	-0.054 (0.315)	0.614*** (0.236)
Disabled member	-0.708 (0.613)	-0.386 (0.734)	-0.418 (0.602)	-0.927 (0.986)	-0.948 (1.267)	-0.608 (0.985)
Log(income) × Disabled member	0.143 (0.095)	0.166 (0.115)	0.116 (0.093)	0.190 (0.157)	0.194 (0.206)	0.141 (0.157)
Log(household size) × Disabled member	-0.019 (0.138)	-0.199 (0.164)	-0.057 (0.135)	-0.080 (0.183)	0.337 (0.217)	0.025 (0.184)
Constant	1.199** (0.491)	2.159*** (0.574)	2.217*** (0.494)	1.106 (0.926)	2.233* (1.167)	1.534* (0.920)
N	7,600	7,600	7,600	2,842	2,842	2,842

Note: 1. Regressions with NATSISS sample, which only include non-remote and non-multifamily households, use a definition of FS which is comparable with HILDA.

2. Standard errors are reported in parentheses.

3. Logistic coefficients are reported.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

TABLE B.2: **Determinants of financial stress for Indigenous Australians**  
(with Extended definition and NATSISS data)

	Excluding remote & multifamily households			Full Sample		
	Cashflow (1)	Hardship (2)	Any stress (3)	Cashflow (4)	Hardship (5)	Any stress (6)
Log(income)	-0.205 (0.145)	-0.632*** (0.172)	-0.195 (0.146)	-0.284** (0.117)	-0.700*** (0.138)	-0.310*** (0.117)
Log(household size)	0.255 (0.205)	0.103 (0.239)	0.248 (0.206)	0.361** (0.150)	0.481*** (0.173)	0.385** (0.150)
Owner without a mortgage	-2.278 (1.671)	-3.992* (2.160)	-2.038 (1.664)	-2.052* (1.178)	-2.977** (1.486)	-1.812 (1.173)
Log(income) × Owner without a mortgage	0.057 (0.264)	0.353 (0.344)	0.011 (0.263)	0.044 (0.189)	0.212 (0.242)	0.000 (0.189)
Log(household size) × Owner without a mortgage	0.140 (0.364)	0.010 (0.471)	0.225 (0.361)	0.345 (0.276)	0.168 (0.371)	0.405 (0.275)
Owner with a mortgage	0.850 (1.229)	1.603 (1.594)	1.082 (1.235)	-0.362 (1.023)	1.177 (1.324)	-0.044 (1.025)
Log(income) × Owner with a mortgage	-0.240 (0.180)	-0.351 (0.241)	-0.274 (0.181)	-0.076 (0.150)	-0.284 (0.200)	-0.117 (0.150)
Log(household size) × Owner with a mortgage	0.066 (0.218)	0.006 (0.284)	0.069 (0.218)	0.207 (0.191)	0.031 (0.255)	0.170 (0.191)
Household with children	0.881 (1.029)	-0.655 (1.211)	1.057 (1.038)	0.763 (0.693)	-0.387 (0.820)	0.902 (0.698)
Log(income) × Household with children	-0.070 (0.157)	0.128 (0.191)	-0.092 (0.158)	-0.055 (0.107)	0.177 (0.131)	-0.073 (1.107)
Log(household size) × Household with children	-0.209 (0.285)	0.035 (0.323)	-0.214 (0.287)	-0.343* (0.187)	-0.417* (0.215)	-0.349* (0.188)
Partnered	0.219 (1.208)	0.459 (1.459)	0.079 (1.215)	0.260 (0.740)	0.111 (0.883)	-0.130 (0.744)
Log(income) × Partnered	-0.150 (0.181)	-0.159 (0.224)	-0.143 (0.182)	-0.092 (0.112)	-0.037 (0.137)	-0.041 (0.112)
Log(household size) × Partnered	0.495* (0.293)	0.116 (0.338)	0.520* (0.295)	0.231 (0.175)	-0.092 (0.211)	0.226 (0.175)
Disabled member	0.050 (0.971)	-0.950 (1.135)	0.463 (0.981)	-0.345 (0.714)	-0.978 (0.817)	-0.036 (0.721)
Log(income) × Disabled member	0.036 (0.154)	0.211 (0.183)	-0.030 (0.156)	0.088 (0.115)	0.220* (0.133)	0.040 (0.116)
Log(household size) × Disabled member	0.015 (0.183)	0.244 (0.201)	0.100 (0.185)	0.042 (0.135)	0.124 (0.150)	0.095 (0.137)
Household has a non-Indigenous member	0.815 (1.184)	1.170 (1.408)	0.996 (1.194)	1.489* (0.851)	1.258 (1.014)	1.545* (0.857)
Log(income) × Household has a non-Indigenous member	-0.185 (0.181)	-0.205 (0.222)	-0.203 (0.183)	-0.352*** (0.129)	-0.317** (0.157)	-0.357*** (0.130)
Log(household size) × Household has a non-Indigenous member	0.258 (0.293)	0.284 (0.327)	0.247 (0.295)	0.552*** (0.199)	0.683*** (0.234)	0.558*** (0.200)
Multi-family household	n\ a	n\ a	n\ a	-1.661 (1.348)	-2.807* (1.529)	-1.642 (1.354)
Log(income) × Multi-family household	n\ a	n\ a	n\ a	0.352* (0.188)	0.505** (0.219)	0.362* (0.189)
Log(household size) × Multi-family household	n\ a	n\ a	n\ a	0.531* (0.282)	-0.294 (0.324)	-0.602** (0.282)
Remote household	n\ a	n\ a	n\ a	0.364 (0.718)	-0.188 (0.851)	0.440 (0.723)
Log(income) × Remote household	n\ a	n\ a	n\ a	-0.111 (0.115)	-0.042 (0.139)	-0.119 (0.116)
Log(household size) × Remote household	n\ a	n\ a	n\ a	0.095 (0.136)	-0.055 (0.157)	0.077 (0.137)
Constant	1.437 (0.919)	3.184*** (1.069)	1.416 (0.922)	1.943*** (0.736)	3.536*** (0.854)	2.140*** (0.740)
N	2,842	2,842	2,842	5,117	5,117	5,117

Note: 1. Standard errors are reported in parentheses.

2. The reported statistics are logistic regression coefficients.

\* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.