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On A New Test Of The Collective Household Model: Evidence From Australia[*]

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Abstract

The principal motivation of this paper is to propose and apply on Australian data a new test of the collective model of the household and examine the importance of "spousal power" in making household decisions. Our paper extends the collective household model by allowing the welfare weights assigned to the different members of the household to be determined endogenously rather than imposed a-priori by an exogenously fixed sharing rule. Estimation is conducted using data from the 1998-99 Australian Household Expenditure Survey data set. We find that the weights and hence the relative bargaining power of males and females have statistically significant effects on household expenditure patterns. The null hypothesis that relative spousal power has no effect on the budget shares of the different commodities is generally rejected. The results also reveal some interesting non-monotonic relationships between relative power and budget shares that vary a great deal across commodities.

JEL Classification: D13, C31.

Key Words: Collective Household Model, Spousal Power, Expenditure Patterns, Australia.

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1. Introduction

The unitary household model, which is used in the conventional analysis of consumer behaviour, can be traced back to Samuelson (1956) and Becker (1981). It is based on the assumption that the household acts as a single unit. In other words, all individuals inside the household are assumed to have identical preferences. There are, principally, two significant behavioural implications of this assumption, namely, (a) individual members pool their income in achieving the various household outcomes and, (b) the identity of the income recipient is of no consequence for the household's behavioural outcomes such as expenditure allocation. That this issue is of considerable interest is evident from the wide use of the unitary model in policy relevant discussions in economics. The apparently restrictive nature of these implications has raised serious questions on the validity of the unitary model. Moreover it is seen that the unitary household model is of not much use in analysing intra household inequality (Kanbur & Haddad (1994)), or the tax treatment of individuals (Apps & Rees (1988), Piggott & Whalley (1996)). Further, as Blacklow & Ray (2002) have observed recently in the context of Australia, the reform of commodity taxes is sensitive to the relaxation of the unitary household framework.

While this approach has proved useful for its elegance and analytical tractability, the underlying hypothesis of a single utility function encompassing all family members has been increasingly challenged in recent years. Such challenges have typically included attempts at modelling individual utility to incorporate divergent and conflicting preference of different family members – see, for example, Manser & Brown (1980), McElroy & Horney (1981), Chiappori (1988), Chiappori

(1992) and Browning & Chiappori (1998).[1] Crucial to the notion of non-unitary models of the household is the concept of power (Pollak (1994)). The analysis has typically taken the form of testing whether different members of the household actually pool their income or whether the identity of the recipient actually matters. While there exists evidence using data sets from a large number of developed and developing countries, the literature on tests of income pooling using data from Australia is surprisingly scarce. To the best of our knowledge the only paper that examines this issue using data from Australia is Lancaster & Ray (2002) who find support for the income pooling hypothesis for some items though not for others. They also find that income pooling across gender is much less likely for older Australians compared to younger couples.

The principal motivation of this paper is to propose and apply to Australian data an alternative test of the unitary model using the collective framework and examine the importance of "spousal power" in making household decisions. In doing so, the paper extends the collective household model by allowing the welfare weights assigned to the various household members to be determined endogenously rather than imposed a priori by an exogenously fixed sharing rule. As Basu (2001) has recently pointed out, the exogenously determined shares is a significant limitation of the collective approach. The proposed test of the collective household model is based on an examination of the impact of "spousal power" on the household's expenditure allocation, namely, the budget share of the various items. The unitary model implies that the spouse's welfare weight or "power" will have no impact on the budget share of an item, a hypothesis that can be easily tested using unit record data. The variable

[1] See, also, Schultz (1990), Thomas (1990), Kanbur & Haddad (1994), Lundberg & Pollak (1994), Hoddinott & Haddad (1995), Lundberg, Pollak & Wales (1997), Frankenberg & Thomas (1998), Phipps & Burton (1998), Quisumbing & Maluccio (2000), Attanasio & Lechene (2002), Maitra & Ray (2002) and Maitra & Ray (2003) for tests of the unitary household model using data sets from different countries.

that plays a key role in our analysis is the relative "power" of individual members of the household. There is now a significant amount of literature in sociology and anthropology that argues that "spousal power" is important in the analysis of household behaviour (see, for example, Blumberg & Coleman (1989), Desai & Jain (1994), Pollak (1994), Riley (1997)). However, there have been few empirical attempts to estimate the determinants of "spousal power", and to quantify the magnitude of its impact on the various behavioural outcomes of the household. The present study using Australian data attempts to throw light on this issue. We extend the framework outlined in Koolwal & Ray (2002) and Blacklow & Ray (2002) to develop an alternative test of the collective household model. One of the principal attractions of the proposed methodology is that it allows a test of the income pooling hypothesis regardless of whether consumption goods are assignable or not.

To be a little more specific, consider a household with two members – a man and a woman. Let $\theta \in [0,1]$ denote the welfare weight of the man, and $(1-\theta)$ that of the woman. In general, θ captures the balance of power within the household. Let z denote the set of variables that determine θ, so that the power function can be written as $\theta(z)$. In the traditional collective model, z typically consists of variables that are exogenous to the household. There are however reasons to argue that θ will be affected by changes in the household's choice vector. This is the point of departure of the present exercise. For example, there is significant sociological and anthropological evidence that suggests that the woman's power in influencing household decisions is dependent on her contribution to household earnings. Since the woman's share of household earnings is a choice variable, θ gets influenced by the household's decision. This is recognised in the empirical analysis of this paper. Besides allowing the power variable (θ) to depend on the earnings share, we also allow it to depend on

the relative educational attainment of the household members vis-à-vis one another and on other household characteristics, including household expenditure (that can be viewed as a proxy for the permanent income of the household) and household size.

The framework proposed and applied here is based on a two-step procedure. In the first stage, the household allocates income to each member according to some income-sharing rule, which depends on the welfare weight (θ) of the individual that will be estimated from the earnings data. In the second stage, each individual maximises her/his sub utility subject to the income allocated to herself/himself. To be able to do this, we make some assumptions on the utility functions of the household members, which will be specified later. The aggregate household demands are, then, obtained by aggregating the individual demand for the various items. The budget share of the items will therefore depend on: (a) the spousal power variable, and (b) the conventional set of economic and household characteristics that affects expenditure patterns. The unitary model of the household predicts that θ will have no effect on household expenditure patterns. Hence, a convenient test of the unitary model is a test of the hypothesis that the budget share of an item for the household is invariant with respect to the power variable.

The rest of the paper is organised as follows. Section 2 describes the methodology that we use in the paper and the estimable budget share equations that are derived from it. This section also describes the data set used in the paper and presents selected descriptive statistics. Section 3 presents the estimation results. Section 4 examines the robustness of the regression results to the estimation methodology. Concluding comments are presented in Section 5.

2. Theoretical Framework, Estimation and Data

The essence of the collective approach is that intra household allocations are Pareto Efficient. Following Browning & Chiappori (1998), the household's objective function can be written as the weighted sum of utilities of the different members. Consider a household with two members: a man (m), and a female (f). Let us assume that each member's utility (U_m, U_f) depends on each other's consumption vectors (x_m, x_f) and each other's leisure (l_m, l_f). The household, hence, maximises:

$$\theta U_m\left(x_m, x_f, l_m, l_f\right) + (1-\theta) U_f\left(x_m, x_f, l_m, l_f\right) \tag{1}$$

subject to the full income constraint:

$$p\left(x_m + x_f\right) \leq w_m\left(T_m - l_m\right) + w_f\left(T_f - l_f\right) + A \tag{2}$$

where p is the price vector of items, $w = \left(w_m, w_f\right)$ is the vector of individuals' wages, $\left(T_i - l_i; i = m, f\right)$ is the vector of hours worked by the two individuals, and A is the aggregate unearned (non-labour) income of the household. The prices, wages and unearned income are assumed exogenous in this analysis. The variable θ, which denotes the welfare weight of m, depends on prices, household income, earnings distribution, bargaining strength, etc.

One can re-interpret this model in terms of a two-stage decision process with an income-sharing rule.[2] To be able to do this we need to make certain additional assumptions regarding the preferences of the different members of the household. First, we assume that the utility function is separable in consumption and leisure and, second, the utility function is weakly separable in the leisure of the different members of the household. This is analogous to a two stage budgeting procedure, where

[2] See Chiappori (1992), and Bourguignon, Browning, Chiappori & Lechene (1993). Strauss, Mwabu & Beegle (2000) provide an excellent summary of the issues involved.

households act as if they first pool and allocate income to each individual according to some sharing rule and then each individual maximises his/her sub-utility subject to the income allocated to him/her. Therefore in step 1, the household decides on θ by maximising a restricted version of (1), namely,

$$\theta(z)U_m\left(l_m,l_f\right)+\left(1-\theta(z)\right)U_f\left(l_m,l_f\right) \tag{3}$$

subject to the full income constraint given by (2) above, where z is the vector of household characteristics that determine θ. Assuming suitable functional forms, we can obtain θ, from the above constrained maximisation exercise, in an estimable form. To be little bit more specific, under suitable functional forms for the first stage utility functions, θ (along with the parameters of the utility function) are obtained using non-linear least squares. The θ thus obtained is taken as given in the second stage of the estimation procedure. In particular, this θ is used as the resource-sharing rule, which leads to the utility maximisation exercise by each individual. If μ denotes the income of the household, then $\theta\mu$ denotes the male's budget constraint and $(1-\theta)\mu$ denotes that of the female. In step 2, the individuals m, f decide on their commodity demand by maximising, respectively:

$$\begin{aligned} &U_m\left(x_m\right) \text{ subject to } p'x_m=\theta\mu \\ &U_f\left(x_f\right) \text{ subject to } p'x_f=(1-\theta)\mu \end{aligned} \tag{4}$$

This yields demand functions for each good $g=1,\ldots,G$ as follows:

$$\begin{aligned} \left\{x_m^g\right\}_{g=1}^G &= x_m^g\left(p,\theta\mu\right) \\ \left\{x_f^g\right\}_{g=1}^G &= x_f^g\left(p,(1-\theta)\mu\right) \end{aligned} \tag{5}$$

The above demand equations can be expressed in budget share form $\left(b_m^g, b_f^g\right)$ as a function of prices, and the individual resource constraints, namely, $\theta\mu$ and $(1-\theta)\mu$. Assuming linearity, we can write these as:

$$\begin{aligned} b_m^g &= \alpha_m^g + \beta_m^g \theta\mu + \varepsilon_m^g \\ b_f^g &= \alpha_f^g + \beta_f^g (1-\theta)\mu + \varepsilon_f^g \end{aligned} \tag{6}$$

where $\varepsilon_m^g, \varepsilon_f^g$ are the stochastic error terms, and we have suppressed the price vector, keeping in mind that the present analysis is on a single cross section, i.e., all households are assumed to face the same prices. In the absence of data on intra household demand $\left(b_m^g, b_f^g\right)$, equation (6) can be aggregated as follows. Denoting b^g to be the observed budget share of g at the household level, we have:

$$\begin{aligned} b^g &= \theta b_m^g + (1-\theta) b_f^g \\ &= \theta\left[\alpha_m^g + \beta_m^g(\theta\mu) + \varepsilon_m^g\right] + (1-\theta)\left[\alpha_f^g + \beta_f^g\left((1-\theta)\mu\right) + \varepsilon_f^g\right] \\ &= \alpha_0^g + \alpha_1^g\theta + \beta_m^g\theta^2\mu + \beta_m^g(1-\theta)^2\mu + \varepsilon^g \end{aligned} \tag{7}$$

$$g = 1, \ldots, G$$

where $\alpha_0^g = \alpha_f^g; \alpha_1^g = \alpha_m^g - \alpha_f^g; \varepsilon^g = \theta\varepsilon_m^g + (1-\theta)\varepsilon_f^g$. In our regressions we also control for other household characteristics that are expected to affect expenditure shares: for example, household size and composition, gender, employment status and country of birth of the household head, and state of residence. Equation (7) can be estimated as a set of seemingly unrelated regression equations (SURE).[3]

According to the unitary household model, $\frac{\partial b^g}{\partial\theta} = 0$. Therefore equation (7) provides a convenient basis for a test of the income-pooling hypothesis underlying the

[3] The specification and estimation of the resource sharing rule, i.e., the power variable θ, has been explained in Koolwal & Ray (2002) and Blacklow & Ray (2002) and is therefore not reported here for the sake of brevity and clarity. Since the focus of this paper is on the test of the unitary household model, we report below the estimation results of the second step, taking as given the θ that was estimated in step 1. The estimates of the functional parameters of θ are available on request.

unitary model. It can be readily verified from (7) that a set of sufficient conditions for $\frac{\partial b^g}{\partial \theta} = 0$ is

$$\alpha_1^g = 0; \beta_m^g \theta = \beta_f^g \left(1 - \theta\right) \tag{8}$$

Thus, a test of (8) constitutes a test of the income-pooling hypothesis underlying the unitary model. The test statistic is distributed as a χ^2 with 2 degrees of freedom. However, since the null hypothesis, given by (8) is data dependent, the test was conducted at several values of θ.

The data set used in this paper came from the 1998-99 Australian Household Expenditure Survey (HES). The data was collected over the twelve-month period July 1998 – June 1999, using interviews though participants were also required to record in a diary all their expenditures over a two-week period. Detailed information was collected on expenditure, income and demographic characteristics of a sample of households residing in private dwellings in Australia. The data set excludes individuals residing in special dwellings (like hospital, institutions, nursing homes, hotels and hostels) and dwellings in remote and sparsely populated regions in Australia. Information was collected from all individuals aged 15 and over in the selected households. The full data set consists of 6892 households (and 13964 persons). For the purposes of this paper we will restrict ourselves to "couple households", which leaves us with a data set comprising of 4444 households. For more on the data set used in the paper see ABS (2002).

We use a 12-commodity classification of household expenditure: current housing costs, domestic fuel and power, food and non-alcoholic beverages, tobacco products, clothing and footwear, medical care and health expenses, transport, recreation, personal care, miscellaneous goods and services and other expenditure.

The average budget share of each of these 12 commodities is presented in Table 1. Note that the expenditure on food constitutes the largest share of expenditure, followed by expenditure on transport, current housing costs and recreation (ignoring expenditure on other items). Expenditure on other items is the aggregate of: household weekly expenditure on household furnishings and equipment, household services and operation, mortgage repayments, other capital housing costs, income tax and superannuation and life insurance. Per capita household income is obtained by dividing the disposable weekly income of the household by the number of usual residents of the household.

3. Estimation Results

Table 2 presents the SUR estimates of the 12 budget share equations. Note that the budget share estimates of the omitted category (other expenditure) are obtained using the "adding up" condition. Using a standard Breusch-Pagan Test we are able to reject the null-hypothesis of independence of the residuals across the equations.[4] This implies that the OLS estimates will be inconsistent.[5]

The bargaining power variable θ that is computed using the first stage estimates affects budget shares in two ways: the first is directly and the second is via the expenditure share rule – remember that the expenditure share of the two members of the household are obtained as $\theta\mu$ and $(1-\theta)\mu$. So while it is tempting to say, for example, that an increase in male bargaining power (the coefficient estimate of θ) increases the budget share of food and reduces the budget share of alcohol (see Table 3) we would be misinterpreting the results, because we would be ignoring the effect

[4] Breusch-Pagan test of independence: $\chi^2(55) = 25.669$, Pr = 0.0000

[5] The OLS estimates for the budget shares of Food and Non-alcoholic beverages are presented in Table 4. For the other commodities, the OLS estimates are available on request.

of θ working through the sharing rule. Table 3 presents the tests to examine whether θ indeed has any effect on the budget shares. The results show that for most commodities, bargaining power has a statistically significant effect on the budget shares. What is interesting is that the test results vary significantly, depending on the value of θ. For low or high values of θ (values of θ close to 0 or 1) the null hypothesis that bargaining power does not matter is generally convincingly rejected (p-values are close to 0.0000) – the only exception is the expenditure share of clothing and footwear. However the null hypothesis that bargaining power does not matter cannot be rejected for θ close to 0.5 and interestingly this result is true for several commodities (alcoholic beverages, tobacco products, clothing and footwear, transport, personal care and miscellaneous goods and services). One might note that the result is not particularly surprising – essentially a value of θ close to 0.5 implies, by definition, that the power of the male and the female member of the household are roughly the same and hence not surprisingly the null hypothesis that θ does not matter cannot be rejected.

To obtain a clearer picture as to how the budget share is affected by changes in θ, we present in Figure 1 the predicted values of the budget shares as we vary θ over the interval $[0,1]$. The values of the other explanatory variables are held constant at the respective sample means. Not surprisingly there is significant non-linearity in the effect of θ on the predicted budget shares. The budget shares of current housing costs, domestic fuel and power, food and non-alcoholic beverages, tobacco products, clothing and footwear, transport and personal care follow an inverted U-shape. However, with the exception of personal care and tobacco products, the predicted budget share at $\theta = 1$ exceeds that at $\theta = 0$. The predicted budget share of tobacco is the same at the two extreme points while the predicted budget share of personal care

is significantly lower at $\theta = 1$ compared to $\theta = 0$. On the other hand the budget shares of alcoholic beverages, medical care and health expenses, recreation and miscellaneous goods and services generally fall as θ increases over the interval $[0,1]$ and finally the predicted budget share of other expenditure follows a U-shape over the interval $[0,1]$.

Turning back to the SUR estimates of the budget shares (Table 2) the following results are worth noting.

1. We find that household size generally has a statistically significant effect on the budget shares – the exceptions are food and non-alcoholic beverages, alcoholic beverages, tobacco and personal care. However the sign of the coefficient varies. An increase in household size increases the budget share of clothing and footwear, transport, recreation, miscellaneous goods and services and other expenditures but decreases the budget shares of current housing costs, domestic fuel and power, medical care and health expenses
2. Relative to the residents of New South Wales, the residents of Victoria spend more on domestic fuel and power, food, transport and recreation but less on current housing costs and other expenditures. On the other hand relative to residents of New South Wales, residents of Queensland spend less on domestic fuel and power and personal care but more on miscellaneous goods and services.
3. Households where the reference person is male (i.e., male headed households) spend more on medical care and health expenses (though the effect is only weakly significant) and on other items but significantly less on current housing costs and clothing and footwear compared to female-headed households.
4. An increase in the years of education of the male adult member of the household significantly increases the expenditure share of medical care and health expenses,

recreation and miscellaneous goods and services, but significantly reduces the expenditure share of domestic fuel and power, food and non-alcoholic beverages, alcoholic beverages, tobacco and personal care. An increase in the number of years of education of the female adult member of the household has a similar impact on expenditure shares though the effects are no longer statistically significant in many cases. Interestingly with the exception of expenditure on tobacco, personal care and miscellaneous goods and services, an increase in the years of education of the male and female adult members of the household have similar effects on the budget shares.

5. Households that live in a house that is being purchased (is mortgaged) spend less on food and non-alcoholic beverages, as do households with 2 registered vehicles. On the other hand households that reside in a 3-bedroom house spend more on food and non-alcoholic beverages.
6. The budget share estimates show that relative to the case where the household head is unemployed, households where the household head works full time spend less on current housing costs, domestic fuel and power, food and non-alcoholic beverages, tobacco, clothing and footwear, recreation and personal care but more on miscellaneous goods and services and other expenditures.
7. Relative to the case where the household head is unemployed, households where the household head works part time spend less on current housing costs, domestic fuel and power, food and non-alcoholic beverages and tobacco but more on alcoholic beverages, transport, miscellaneous goods and services and other expenditures (though the last effect is not statistically significant).

8. Households where the head is self-employed spend more on miscellaneous goods and services and other expenditures but less on domestic fuel and power, food and non-alcoholic beverages, recreation and personal care.
9. Finally the budget share estimates show that households where the head is born in Australia spend significantly more on alcoholic beverages, as do households where the household head is born in North-West Europe.

4. Robustness

We now turn to the issue of how robust our results are to (1) the estimation methodology used and (2) the definition of "power" that we have used in our analysis.

First, how appropriate is the use of SUR in estimating the budget shares? The main reason for using SUR was that using a standard Breusch-Pagan Test we are able to reject the null-hypothesis of independence of the residuals across the equations. This implies that the OLS estimates will be inconsistent. However as a point of comparison we also computed the corresponding (equation by equation) OLS estimates of budget shares. Table 4 presents the OLS estimates for the expenditure share of Food and Non-alcoholic beverages. This is Model II in Table 4. The estimated coefficients for the remaining commodities are available on request. When we compare the SUR and OLS estimates (Models I and II respectively), it is clear that both the coefficients and standard errors are similar (see Table 4) and the tests for the effect of bargaining power yield similar results (see Table 5).

One consequence of the two-step budgeting procedure that we have used here is that for the purposes of expenditure allocation (stage 2) θ is exogenous, though one must remember that for the "problem" as a whole it is not. One might be interested in finding out how important this assumption is. To do so we re-estimate

the budget share equations but θ is no longer defined as above. Instead we consider a standard one-step estimation but with θ defined as the male share of earnings. Model III in Table 4 presents the corresponding OLS estimates of budget shares of food and non-alcoholic beverages. The tests for the effect of bargaining power are presented in Table 5. Qualitatively (though not quantitatively) the results are similar, with one difference: the test for no effect of bargaining power cannot be rejected for $\theta = 0.5$ for Model III, unlike in Models I and II.

However when θ is simply defined as the share of male earnings, it could be correlated with the unobserved determinants of expenditure shares. To examine this issue we estimated the Durbin-Wu-Hausman augmented regression to test for the joint exogeneity of the resource inflow variables. To do this we regressed the (potentially) endogenous power variable (here simply the male share of earnings) on all the exogenous variables in the system and used the predicted values from this regression as an additional explanatory variable in the budget share regressions. This variable turned out to be highly statistically significant implying that the OLS estimates are not consistent. We therefore use instrumental variable estimation where the instruments used are: relative educational attainment of males in the household defined as $\frac{E_m}{E_m + E_f}$, where E_m and E_f are the number of years of schooling of the male and female member of the household, aggregate household expenditure and household size. Table 4 presents the IV estimates for the budget shares of food and Non-alcoholic beverages.[6] In the appendix (Table A1) we present the first stage results from the IV estimation. The estimated coefficients show that male power is positively related to relative educational attainment of the male member of the household and to

[6] The estimates for the remaining budget shares are not presented because of space constraints. They are however available on request.

household size and negatively to household permanent income. Table 5 reports the results of the test of the hypothesis that changes in the bargaining power of individuals inside the household have no impact on the share of food in the household's budget. Like the results for Models I and II, in this case also the null hypothesis that bargaining power does not matter is always rejected (See Table 5). Some other results are worth noting (See Table 4). First, as in Models I, II and III, male headed households spend less on food and non-alcoholic beverages though in Model IV the effect is statistically significant. Second, the household composition variables in Model IV have a stronger impact on the budget share of food and non-alcoholic beverages compared to the other Models. Third, additional years of education attained by the male member of the household now actually increase the budget share of food and non-alcoholic beverages, though the effect is not statistically significant.

5. Conclusion

This paper examines the impact of changes in the bargaining power of adult members on a household's expenditure allocation. Since the conventional unitary model assumes that there is no impact, the statistical significance of this impact or otherwise constitutes a test of the unitary versus collective model of the household. This study on Australian Household Expenditure data, besides providing Australian evidence on this issue, contains some new methodological and empirical features: first, we extend the collective models of the household, that have been proposed recently, by allowing the welfare weights to be determined from the data rather than fixed a priori; second, we allow these welfare weights to depend not only on the earnings share that has been conventionally used but also on additional variables such as the educational

experiences of the adults, household income and household size; third, the study provides Australian evidence on the effect of "spousal power" on household expenditure patterns.

The overall message from these results is that the bargaining power of the adult member does affect expenditure pattern and that the income-pooling hypothesis underlying the unitary model is rejected by the data. The paper provides evidence of non-monotonic relationships between the budget share of an item and bargaining power. It is interesting to note (see Figure 1) that the nature of these relationships varies a great deal between items.

Table 1: Descriptive Statistics of Selected Variables

Variable	Mean	Std. Dev.
Budget Share of Current Housing Costs	0.0982	0.0836
Budget Share of Domestic Fuel and Power	0.0234	0.0191
Budget Share of Food and Non-Alcoholic Beverages	0.1559	0.0792
Budget Share of Alcoholic Beverages	0.0201	0.0300
Budget Share of Tobacco Products	0.0121	0.0280
Budget Share of Clothing and Footwear	0.0328	0.0412
Budget Share of Medical Care and Health Expenses	0.0378	0.0431
Budget Share of Transport	0.1177	0.1078
Budget Share of Recreation	0.0925	0.0800
Budget Share of Personal Care	0.0148	0.0178
Budget Share of Miscellaneous Goods and Services	0.0574	0.0594
Budget Share of Other Expenditure	0.3374	0.1713
θ (Male Power)	0.4106	0.2666
Female Earned Income	265.4415	338.2299
Male Earned Income	562.5302	612.3563
Per Capita Disposable Income	291.4620	174.8957
Number of Usual Residents	3.3783	1.2870
One or More Aged 0 – 2	0.0882	0.2836
One Aged 2 – 4	0.1082	0.3107
Two or More Aged 2 – 4	0.0169	0.1288
One Aged 5 – 9	0.1287	0.3349
Two or More Aged 5 – 9	0.0601	0.2377
One or More Aged 10 – 12	0.1517	0.3587
One of More Aged 13 – 14	0.1240	0.3296
Household Reference Person: Male	0.7291	0.4445
Years of Education of Male Adult Member	12.2136	2.3517
Years of Education of Female Adult Member	11.7934	2.2733
Resident of Victoria	0.2075	0.4055
Resident of Queensland	0.1577	0.3645
Resident of South Australia	0.0752	0.2637
Resident of Western Australia	0.0873	0.2823
Resident of Tasmania	0.0686	0.2529
Resident of Northern Territory	0.0608	0.2389
Resident of ACT	0.0369	0.1885
Country of Origin of Household Reference Person: Australia	0.6958	0.4601
Country of Origin of Spouse: Australia	0.6926	0.4615
Country of Origin of Household Reference Person: Other Oceania	0.0275	0.1634
Country of Origin of Spouse: Other Oceania	0.0290	0.1679
Country of Origin of Household Reference Person: North-West Europe	0.1161	0.3204
Country of Origin of Spouse: North-West Europe	0.1130	0.3166
Country of Origin of Household Reference Person: Southern Europe	0.0641	0.2450
Country of Origin of Spouse: Southern Europe	0.0581	0.2339
Country of Origin of Household Reference Person: South East Asia	0.0342	0.1818
Country of Origin of Spouse: South East Asia	0.0428	0.2023

Table 1: (Continued)

Variable	Mean	Std. Dev.
Household Reference Person Employed Full Time	0.6125	0.4872
Spouse Employed Full Time	0.2428	0.4288
Household Reference Person Employed Part Time	0.0900	0.2862
Spouse Employed Part Time	0.2090	0.4067
Household Reference Person Self Employed	0.0905	0.2869
Spouse Self Employed	0.1123	0.3158
Lives in a Separate House	0.9035	0.2954
House Mortgaged	0.4048	0.4909
Lives in a 3 Bedroom House	0.5410	0.4984
2 Vehicles Registered to the Household	0.4059	0.4911

Table 2: Budget Share Estimates

Regressor	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expdn
Constant	252.3502	55.5341	259.8898	26.1610	45.0804	13.8866	60.4582	142.8569	59.0122	21.2742	-14.6196	78.1159
	(21.56)	(22.48)	(25.75)	(5.71)	(10.69)	(2.21)	(9.38)	(8.65)	(4.88)	(7.81)	(-1.64)	(3.90)
θ	22.8492	5.0971	7.0346	-3.3711	3.8728	-1.4894	-10.5814	10.0096	-17.6887	-0.8138	3.4373	-18.3560
	(3.74)	(3.95)	(1.34)	(-1.41)	(1.76)	(-0.45)	(-3.15)	(1.16)	(-2.80)	(-0.57)	(0.74)	(-1.76)
$\theta^2\mu$	-0.1156	-0.0354	-0.1820	-0.0041	-0.0182	-0.0008	-0.0164	-0.0978	-0.0089	-0.0097	-0.0228	0.5116
	(-7.77)	(-11.28)	(-14.19)	(-0.70)	(-3.40)	(-0.10)	(-2.00)	(-4.66)	(-0.58)	(-2.81)	(-2.02)	(20.11)
$(1-\theta)^2\mu$	-0.0712	-0.0222	-0.1378	-0.0139	-0.0087	-0.0032	-0.0387	-0.0573	-0.0310	-0.0079	-0.0255	0.4174
	(-6.60)	(-9.73)	(-14.80)	(-3.30)	(-2.23)	(-0.55)	(-6.51)	(-3.76)	(-2.78)	(-3.12)	(-3.11)	(22.60)
Log (Number of Usual Residents)	-63.7014	-9.0580	-3.2378	-1.2825	-2.7257	22.5926	-11.7978	20.6723	11.3141	0.4311	24.1059	12.6872
	(-13.14)	(-8.85)	(-0.77)	(-0.68)	(-1.56)	(8.67)	(-4.42)	(3.02)	(2.26)	(0.38)	(6.55)	(1.53)
One or More Aged 0 – 2	46.6382	0.8196	-12.6027	-5.0892	1.1358	1.8187	-7.3655	-13.7260	-17.5572	-3.3260	-15.2982	24.5525
	(10.70)	(0.89)	(-3.35)	(-2.98)	(0.72)	(0.78)	(-3.07)	(-2.23)	(-3.90)	(-3.28)	(-4.62)	(3.29)
One Aged 2 – 4	23.5822	1.2581	-10.6284	-4.3705	-0.6296	-4.1935	-1.0191	-22.3238	-5.3081	-0.6184	-13.6057	37.8568
	(5.74)	(1.45)	(-3.00)	(-2.72)	(-0.43)	(-1.90)	(-0.45)	(-3.85)	(-1.25)	(-0.65)	(-4.36)	(5.38)
Two or More Aged 2 – 4	50.0798	2.6431	-6.1012	-9.0582	0.1076	-14.9952	-6.4224	-25.6117	9.1773	-3.1887	-31.1172	34.4868
	(5.53)	(1.38)	(-0.78)	(-2.56)	(0.03)	(-3.08)	(-1.29)	(-2.01)	(0.98)	(-1.51)	(-4.53)	(2.23)
One Aged 5 – 9	26.3265	1.7874	-5.0117	-3.1798	1.5441	-6.2077	-5.5343	-12.5477	-9.6270	-3.1345	-8.4272	24.0119
	(6.93)	(2.23)	(-1.53)	(-2.14)	(1.13)	(-3.04)	(-2.65)	(-2.34)	(-2.45)	(-3.55)	(-2.92)	(3.70)
Two or More Aged 5 – 9	36.0096	4.1985	-0.2371	-3.9404	0.9139	-10.8753	-4.9954	-26.4419	-12.1241	-4.2540	-10.2566	32.0027
	(6.79)	(3.75)	(-0.05)	(-1.90)	(0.48)	(-3.81)	(-1.71)	(-3.53)	(-2.21)	(-3.44)	(-2.54)	(3.53)
One or More Aged 10 – 12	16.6067	0.8606	-3.7252	-3.9990	0.4661	-3.8176	-3.8252	-19.1381	4.2858	-0.0297	3.8113	8.5043
	(4.54)	(1.11)	(-1.18)	(-2.79)	(0.35)	(-1.94)	(-1.90)	(-3.71)	(1.13)	(-0.03)	(1.37)	(1.36)
One or More Aged 13 – 14	11.7800	2.5682	8.7387	-5.3225	-1.2110	-5.8297	-2.6366	-25.0043	-5.3761	-0.9286	11.5143	11.7077
	(2.97)	(3.06)	(2.55)	(-3.42)	(-0.85)	(-2.73)	(-1.21)	(-4.46)	(-1.31)	(-1.00)	(3.82)	(1.72)
Household Reference Person: Male	-10.6030	-0.8959	-3.9229	-0.0846	-0.7644	-6.5815	2.5810	-4.7298	3.4974	-0.6552	-3.1929	25.3517
	(-3.65)	(-1.46)	(-1.56)	(-0.07)	(-0.73)	(-4.21)	(1.61)	(-1.15)	(1.16)	(-0.97)	(-1.45)	(5.10)

Table 2 (Continued)

Regressor	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expdn
Years of Schooling of Male Member	-1.1576	-0.6174	-1.8478	-0.4563	-1.3726	0.0498	0.6143	-1.3232	2.1400	-0.2995	2.3471	1.9231
	(-2.01)	(-5.07)	(-3.71)	(-2.02)	(-6.60)	(0.16)	(1.93)	(-1.62)	(3.59)	(-2.23)	(5.36)	(1.95)
Years of Schooling of Female Member	-0.7370	-0.5895	-0.6228	-0.1560	-0.7618	0.2877	-0.1461	-1.2120	1.2034	0.1682	0.9003	1.6656
	(-1.22)	(-4.64)	(-1.20)	(-0.66)	(-3.51)	(0.89)	(-0.44)	(-1.43)	(1.93)	(1.20)	(1.97)	(1.62)
Resident of Victoria	-17.6293	7.0995	7.6750	-1.3047	0.3349	-0.0615	-1.0914	9.8640	7.6782	-0.2584	1.3646	-13.6709
	(-5.45)	(10.40)	(2.75)	(-1.03)	(0.29)	(-0.04)	(-0.61)	(2.16)	(2.30)	(-0.34)	(0.56)	(-2.47)
Resident of Queensland	0.5174	-4.1106	-0.1714	-1.3834	0.2308	-2.3663	-0.6864	-1.0698	4.9391	-1.2054	4.5173	0.7887
	(0.15)	(-5.52)	(-0.06)	(-1.00)	(0.18)	(-1.25)	(-0.35)	(-0.21)	(1.35)	(-1.47)	(1.69)	(0.13)
Resident of South Australia	-6.0863	5.0419	0.9428	-3.4383	0.4719	0.0573	-1.5355	-11.0790	14.1965	1.0435	9.6257	-9.2404
	(-1.32)	(5.17)	(0.24)	(-1.90)	(0.28)	(0.02)	(-0.60)	(-1.70)	(2.98)	(0.97)	(2.74)	(-1.17)
Resident of Western Australia	-20.3285	3.4480	-2.2951	2.8675	4.3791	-3.4492	-2.4611	15.9201	7.3336	-0.6703	0.5824	-5.3265
	(-4.67)	(3.76)	(-0.61)	(1.68)	(2.79)	(-1.47)	(-1.03)	(2.59)	(1.63)	(-0.66)	(0.18)	(-0.72)
Resident of Tasmania	-12.7786	8.9100	-6.4825	-2.7020	1.1294	0.2746	-0.9263	-7.8844	10.7603	-0.6676	3.8633	6.5038
	(-2.67)	(8.82)	(-1.57)	(-1.44)	(0.66)	(0.11)	(-0.35)	(-1.17)	(2.18)	(-0.60)	(1.06)	(0.79)
Resident of Northern Territory	10.3091	4.1988	6.2065	3.4100	2.4438	-10.2562	-4.4315	2.6998	16.3110	-1.4122	-1.0241	-28.4551
	(2.01)	(3.87)	(1.40)	(1.70)	(1.32)	(-3.71)	(-1.57)	(0.37)	(3.07)	(-1.18)	(-0.26)	(-3.24)
Resident of ACT	0.8569	4.3134	-11.4549	-2.8581	1.6343	-3.1236	-4.5263	18.1208	7.8372	0.9964	6.4343	-18.2304
	(0.14)	(3.28)	(-2.13)	(-1.17)	(0.73)	(-0.93)	(-1.32)	(2.06)	(1.22)	(0.69)	(1.36)	(-1.71)

Table 2: (Continued)

Regressor	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expdn
Country of Birth of Household Reference Person: Australia	-10.3755	0.4437	1.3392	6.2608	2.9869	0.5483	0.8098	-5.2597	3.3504	1.1606	3.7129	-4.9776
	(-1.57)	(0.32)	(0.24)	(2.42)	(1.26)	(0.15)	(0.22)	(-0.56)	(0.49)	(0.75)	(0.74)	(-0.44)
Country of Birth of Spouse: Australia	-11.3928	-1.3289	2.5124	7.8180	-0.8181	0.3665	3.8593	3.3929	12.5062	0.0152	0.2316	-17.1624
	(-1.75)	(-0.97)	(0.45)	(3.07)	(-0.35)	(0.10)	(1.08)	(0.37)	(1.86)	(0.01)	(0.05)	(-1.54)
Country of Birth of Household Reference Person: Other Oceania	10.1840	2.4901	-3.2058	4.3176	-1.4286	-1.2722	-13.4862	-9.8965	2.8948	-2.2239	8.5068	3.1199
	(1.04)	(1.21)	(-0.38)	(1.13)	(-0.41)	(-0.24)	(-2.51)	(-0.72)	(0.29)	(-0.98)	(1.15)	(0.19)
Country of Birth of Spouse: Other Oceania	11.8879	-1.5045	4.2013	6.2599	1.1084	-7.0223	6.8663	-1.3550	-2.0342	1.6871	-1.4251	-18.6698
	(1.25)	(-0.75)	(0.51)	(1.69)	(0.32)	(-1.38)	(1.31)	(-0.10)	(-0.21)	(0.76)	(-0.20)	(-1.15)
Country of Birth of Household Reference Person: North-West Europe	-6.3307	0.0306	5.7337	4.7501	2.7935	-3.0494	-2.7495	-2.1417	7.9629	0.4414	-3.7240	-3.7169
	(-0.86)	(0.02)	(0.91)	(1.65)	(1.06)	(-0.77)	(-0.68)	(-0.21)	(1.05)	(0.26)	(-0.67)	(-0.30)
Country of Birth of Spouse: North-West Europe	-9.1686	-2.4205	-1.4980	7.8468	-2.3856	-4.6157	2.4569	-3.7575	16.9213	2.2869	0.4829	-6.1488
	(-1.27)	(-1.59)	(-0.24)	(2.79)	(-0.92)	(-1.19)	(0.62)	(-0.37)	(2.28)	(1.37)	(0.09)	(-0.50)

Table 2 (Continued)

Regressor	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expdn
Country of Birth of Household Reference Person: Southern Europe	-3.8749	2.5568	13.2313	-4.3572	4.7135	9.3310	0.0793	-12.4135	-19.1587	2.3076	-2.6431	10.2280
	(-0.43)	(1.34)	(1.69)	(-1.23)	(1.44)	(1.92)	(0.02)	(-0.97)	(-2.05)	(1.09)	(-0.38)	(0.66)
Country of Birth of Spouse: Southern Europe	-18.9715	2.9498	10.2658	10.5265	-3.0739	-12.5546	1.8322	11.2110	6.6601	-1.0409	7.2102	-15.0147
	(-2.06)	(1.52)	(1.29)	(2.92)	(-0.93)	(-2.54)	(0.36)	(0.86)	(0.70)	(-0.49)	(1.03)	(-0.95)
Country of Birth of Household Reference Person: South East Asia	12.2048	-1.1724	8.9269	-1.5945	-3.6973	1.6436	-5.9935	-23.2828	-10.1248	2.1137	-0.4427	21.4191
	(1.18)	(-0.54)	(1.00)	(-0.39)	(-0.99)	(0.30)	(-1.05)	(-1.60)	(-0.95)	(0.88)	(-0.06)	(1.21)
Country of Birth of Spouse: South-East Asia	-19.9066	-1.5926	10.3473	0.7862	-3.5988	-0.5311	0.0145	19.5649	2.5193	-2.2337	1.1545	-6.5238
	(-2.08)	(-0.79)	(1.25)	(0.21)	(-1.04)	(-0.10)	(0.00)	(1.45)	(0.26)	(-1.00)	(0.16)	(-0.40)
Household Reference Person Employed Full Time	-3.8174	-7.9246	-30.3876	0.6980	-1.5621	-5.3738	-5.2078	13.7014	-22.8110	-2.6120	10.3392	54.9580
	(-0.87)	(-8.52)	(-8.00)	(0.40)	(-0.98)	(-2.27)	(-2.15)	(2.20)	(-5.01)	(-2.55)	(3.09)	(7.29)
Spouse Employed Full Time	11.8900	-0.6786	-11.2468	2.7677	1.8315	0.5813	-2.5486	-6.7140	-8.7155	1.2769	11.2758	0.2802
	(2.56)	(-0.69)	(-2.80)	(1.52)	(1.09)	(0.23)	(-1.00)	(-1.02)	(-1.81)	(1.18)	(3.19)	(0.04)
Household Reference Person Employed Part Time	-13.2149	-4.3298	-8.8953	4.5724	-2.0601	-0.6383	-2.7192	22.6797	-3.5111	-0.0183	7.8057	0.3291
	(-2.54)	(-3.95)	(-1.99)	(2.25)	(-1.10)	(-0.23)	(-0.95)	(3.09)	(-0.65)	(-0.02)	(1.98)	(0.04)
Spouse Employed Part Time	11.9217	-0.9903	-4.7166	1.2615	1.3318	4.3032	-3.2057	-7.1656	-10.1210	0.7354	6.7948	-0.1491
	(2.67)	(-1.05)	(-1.22)	(0.72)	(0.83)	(1.79)	(-1.30)	(-1.14)	(-2.19)	(0.71)	(2.00)	(-0.02)

Table 2: (Continued)

Regressor	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expdn
Household Reference Person Self Employed	-8.0618	-3.6865	-9.3653	1.9212	-2.1560	0.1295	2.4371	3.2125	-17.2491	-2.7166	12.4892	23.0457
	(-1.43)	(-3.11)	(-1.93)	(0.87)	(-1.07)	(0.04)	(0.79)	(0.41)	(-2.97)	(-2.08)	(2.93)	(2.40)
Spouse Self Employed	-0.4554	0.0193	-5.3504	0.8010	-1.3854	0.9782	0.4265	-12.9808	-5.4465	0.7375	7.9717	14.6841
	(-0.09)	(0.02)	(-1.25)	(0.41)	(-0.78)	(0.37)	(0.16)	(-1.86)	(-1.06)	(0.64)	(2.12)	(1.73)
Lives in Separate House	-41.3519	2.6625	-0.3507	-1.2918	-5.2799	3.6142	6.8224	9.9651	8.6149	1.2940	1.5567	13.7445
	(-10.25)	(3.13)	(-0.10)	(-0.82)	(-3.63)	(1.67)	(3.07)	(1.75)	(2.07)	(1.38)	(0.51)	(1.99)
House Mortgaged	17.8534	-2.3840	-21.0810	-2.0791	-0.6364	-5.6071	-8.8928	-13.2237	-20.9311	-2.7004	-10.7997	70.4820
	(7.04)	(-4.45)	(-9.64)	(-2.10)	(-0.70)	(-4.11)	(-6.37)	(-3.70)	(-7.99)	(-4.57)	(-5.61)	(16.25)
Resides in a 3 Bedroom House	-0.0412	-0.5139	4.3416	-1.4751	1.8785	0.3501	-2.8842	3.0417	-2.1613	-0.5531	-1.5713	-0.4118
	(-0.02)	(-1.03)	(2.14)	(-1.60)	(2.21)	(0.28)	(-2.22)	(0.91)	(-0.89)	(-1.01)	(-0.88)	(-0.10)
2 Registered Vehicles in the Household	-8.5331	-0.0339	-3.9490	-0.6231	-0.8603	3.4766	3.4653	4.0562	0.0038	-0.3891	2.2582	1.1284
	(-3.62)	(-0.07)	(-1.94)	(-0.67)	(-1.01)	(2.74)	(2.67)	(1.22)	(0.00)	(-0.71)	(1.26)	(0.28)

Notes: t-values in parenthesis
Coefficients and Standard Errors Multiplied by 1000
Breusch-Pagan test of independence: $\chi^2(55) = 2292.465$, Pr = 0.0000

Table 3: Test for Effect of Bargaining Power

θ	Current Housing Costs	Domestic Fuel and Power	Food and Non-Alcoholic Beverages	Alcoholic Beverages	Tobacco Products	Clothing and Footwear	Medical Care and Health Expenses	Transport	Recreation	Personal Care	Miscellaneous Goods and Services	Other Expenditure
0.00	97.45	177.29	293.67	10.88	14.20	0.36	42.45	23.82	10.84	10.52	15.09	676.54
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.84)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
0.10	91.33	160.20	255.05	10.57	13.00	0.33	39.47	20.42	9.98	8.50	15.06	598.84
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.85)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
0.20	78.95	130.05	191.92	9.68	10.89	0.29	33.93	15.09	8.91	5.61	14.22	465.87
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.86)	(0.00)	(0.00)	(0.01)	(0.06)	(0.00)	(0.00)
0.30	56.83	82.54	100.77	7.70	7.60	0.24	24.74	7.84	7.98	2.18	11.62	263.09
	(0.00)	(0.00)	(0.00)	(0.02)	(0.02)	(0.89)	(0.00)	(0.02)	(0.02)	(0.34)	(0.00)	(0.00)
0.40	29.00	31.79	16.73	4.68	4.14	0.21	14.20	1.92	8.18	0.33	6.77	57.34
	(0.00)	(0.00)	(0.00)	(0.10)	(0.13)	(0.90)	(0.00)	(0.38)	(0.02)	(0.85)	(0.03)	(0.00)
0.50	14.23	16.57	11.84	2.37	3.18	0.23	9.91	2.94	10.08	2.53	2.16	12.13
	(0.00)	(0.00)	(0.00)	(0.31)	(0.20)	(0.89)	(0.01)	(0.23)	(0.01)	(0.28)	(0.34)	(0.00)
0.60	19.77	41.43	78.65	2.09	4.97	0.28	13.66	9.35	12.29	6.91	0.56	133.75
	(0.00)	(0.00)	(0.00)	(0.35)	(0.08)	(0.87)	(0.00)	(0.01)	(0.00)	(0.03)	(0.76)	(0.00)
0.70	32.95	75.53	152.65	2.91	7.36	0.33	19.79	15.74	13.73	10.54	1.10	286.27
	(0.00)	(0.00)	(0.00)	(0.23)	(0.03)	(0.85)	(0.00)	(0.00)	(0.00)	(0.01)	(0.58)	(0.00)
0.80	45.06	103.11	207.86	3.90	9.28	0.36	24.99	20.26	14.48	12.84	2.26	405.84
	(0.00)	(0.00)	(0.00)	(0.14)	(0.01)	(0.83)	(0.00)	(0.00)	(0.00)	(0.00)	(0.32)	(0.00)
0.90	54.33	122.81	245.36	4.74	10.64	0.38	28.81	23.23	14.84	14.22	3.38	489.67
	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.83)	(0.00)	(0.00)	(0.00)	(0.00)	(0.18)	(0.00)
1.00	61.16	136.68	270.77	5.40	11.59	0.39	31.56	25.18	15.01	15.06	4.33	547.89
	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.82)	(0.00)	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)
Average θ	26.46	27.89	11.54	4.36	3.88	0.21	13.32	1.64	8.31	0.36	6.20	42.55
	(0.00)	(0.00)	(0.00)	(0.11)	(0.14)	(0.90)	(0.00)	(0.44)	(0.02)	(0.84)	(0.05)	(0.00)

Notes: p-values in parenthesis

Table 4: Budget Share of Food and Non-Alcoholic Beverages: Examining the Robustness of the Results

	Model I[#]	Model II[##]	Model III[###]	Model IV[####]
Constant	259.8898	259.8898	261.5170	-494.3343
	(25.75)	(25.62)	(24.55)	(-2.97)
θ	7.0346	7.0346	-8.4627	1408.7370
	(1.34)	(1.33)	(-1.12)	(4.59)
$\theta^2\mu$	-0.1820	-0.1820	-0.1598	-1.1661
	(-14.19)	(-14.12)	(-14.23)	(-5.30)
$(1-\theta)^2\mu$	-0.1378	-0.1378	-0.1895	2.5277
	(-14.80)	(-14.73)	(-9.06)	(4.28)
Log (Number of Usual Residents)	-3.2378	-3.2378	7.3777	-3.4917
	(-0.77)	(-0.77)	(1.81)	(-0.28)
One or More Aged 0 – 2	-12.6027	-12.6027	-12.9087	-80.0673
	(-3.35)	(-3.34)	(-3.37)	(-4.33)
One Aged 2 – 4	-10.6284	-10.6284	-10.2608	-60.1823
	(-3.00)	(-2.98)	(-2.85)	(-3.95)
Two or More Aged 2 – 4	-6.1012	-6.1012	-7.6379	-84.2638
	(-0.78)	(-0.78)	(-0.96)	(-2.92)
One Aged 5 – 9	-5.0117	-5.0117	-6.5866	-27.6851
	(-1.53)	(-1.52)	(-1.98)	(-2.53)
Two or More Aged 5 – 9	-0.2371	-0.2371	-2.3003	-43.3001
	(-0.05)	(-0.05)	(-0.49)	(-2.63)
One or More Aged 10 – 12	-3.7252	-3.7252	-4.3821	-13.6365
	(-1.18)	(-1.18)	(-1.37)	(-1.39)
One or More Aged 13 – 14	8.7387	8.7387	9.1892	31.2060
	(2.55)	(2.54)	(2.65)	(2.74)
Household Reference Person: Male	-3.9229	-3.9229	-2.9480	-108.7868
	(-1.56)	(-1.56)	(-1.06)	(-4.47)
Years of Schooling of Male Member	-1.8478	-1.8478	-1.7676	0.7396
	(-3.71)	(-3.69)	(-3.49)	(0.46)
Years of Schooling of Female Member	-0.6228	-0.6228	-0.9005	-2.5567
	(-1.20)	(-1.19)	(-1.71)	(-1.58)
Resident of Victoria	7.6750	7.6750	7.6855	14.4011
	(2.75)	(2.74)	(2.73)	(1.68)
Resident of Queensland	-0.1714	-0.1714	0.7332	-6.3594
	(-0.06)	(-0.06)	(0.24)	(-0.68)
Resident of South Australia	0.9428	0.9428	1.1929	-2.2798
	(0.24)	(0.24)	(0.30)	(-0.19)
Resident of Western Australia	-2.2951	-2.2951	-1.8701	-0.4973
	(-0.61)	(-0.61)	(-0.49)	(-0.04)
Resident of Tasmania	-6.4825	-6.4825	-6.0003	-16.8899
	(-1.57)	(-1.56)	(-1.44)	(-1.33)
Resident of Northern Territory	6.2065	6.2065	6.1396	9.1785
	(1.40)	(1.39)	(1.37)	(0.68)

Table 4: (Continued)

	Model I[#]	Model II[##]	Model III[###]	Model IV[####]
Resident of ACT	-11.4549	-11.4549	-12.1007	-27.4932
	(-2.13)	(-2.12)	(-2.23)	(-1.66)
Country of Birth of Household Reference Person: Australia	1.3392	1.3392	-0.3756	20.5857
	(0.24)	(0.23)	(-0.07)	(1.16)
Country of Birth of Spouse: Australia	2.5124	2.5124	3.6807	-4.6708
	(0.45)	(0.44)	(0.65)	(-0.27)
Country of Birth of Household Reference Person: Other Oceania	-3.2058	-3.2058	-6.5759	36.9215
	(-0.38)	(-0.38)	(-0.77)	(1.36)
Country of Birth of Spouse: Other Oceania	4.2013	4.2013	5.8387	-23.1218
	(0.51)	(0.51)	(0.71)	(-0.90)
Country of Birth of Household Reference Person: North-West Europe	5.7337	5.7337	4.0653	28.0749
	(0.91)	(0.90)	(0.64)	(1.42)
Country of Birth of Spouse: North-West Europe	-1.4980	-1.4980	-0.8529	-11.6738
	(-0.24)	(-0.24)	(-0.14)	(-0.62)
Country of Birth of Household Reference Person: Southern Europe	13.2313	13.2313	10.8806	63.7964
	(1.69)	(1.69)	(1.38)	(2.43)
Country of Birth of Spouse: Southern Europe	10.2658	10.2658	12.0034	-6.7412
	(1.29)	(1.29)	(1.50)	(-0.28)
Country of Birth of Household Reference Person: South East Asia	8.9269	8.9269	6.9956	46.7106
	(1.00)	(1.00)	(0.78)	(1.65)
Country of Birth of Spouse: South-East Asia	10.3473	10.3473	11.6180	-13.2346
	(1.25)	(1.25)	(1.39)	(-0.52)
Household Reference Person Employed Full Time	-30.3876	-30.3876	-33.9638	-228.7540
	(-8.00)	(-7.96)	(-8.91)	(-5.25)
Spouse Employed Full Time	-11.2468	-11.2468	-30.4903	87.2558
	(-2.80)	(-2.79)	(-9.72)	(3.22)
Household Reference Person Employed Part Time	-8.8953	-8.8953	-11.2292	-117.0960
	(-1.99)	(-1.98)	(-2.53)	(-4.43)
Spouse Employed Part Time	-4.7166	-4.7166	-15.7417	98.2127
	(-1.22)	(-1.22)	(-5.14)	(3.74)

Table 4: (Continued)

	Model I[#]	Model II[##]	Model III[###]	Model IV[####]
Household Reference Person Self Employed	-9.3653 (-1.93)	-9.3653 (-1.92)	-14.9470 (-3.08)	-159.1077 (-4.63)
Spouse Self Employed	-5.3504 (-1.25)	-5.3504 (-1.25)	-13.9167 (-3.49)	79.0372 (3.38)
Lives in Separate House	-0.3507 (-0.10)	-0.3507 (-0.10)	0.2500 (0.07)	-0.1582 (-0.02)
House Mortgaged	-21.0810 (-9.64)	-21.0810 (-9.59)	-20.9913 (-9.50)	-29.0804 (-4.25)
Resides in a 3 Bedroom House	4.3416 (2.14)	4.3416 (2.12)	4.3584 (2.12)	2.5421 (0.41)
2 Registered Vehicles in the Household	-3.9490 (-1.94)	-3.9490 (-1.93)	-4.1068 (-2.00)	-3.7561 (-0.61)

Notes:

[#]: SUR Regression. Two-step Estimation.
[##]: OLS Regression. Two-step Estimation.
[###]: OLS Regression. One-step Estimation. Power defined by male share of income.
[####]: IV Regression. One-step Estimation. Power defined by male share of income.
t-values in parenthesis
Coefficients and Standard Errors Multiplied by 1000

Table 5: Effect of Bargaining Power on Expenditure on Food and Non-Alcoholic Beverages

θ	**Model I**[#]	**Model II**[##]	**Model III**[###]	**Model IV**[####]
0.00	293.67	145.38	66.96	17.94
	(0.00)	(0.00)	(0.00)	(0.00)
0.10	255.05	126.26	57.07	16.83
	(0.00)	(0.00)	(0.00)	(0.00)
0.20	191.92	95.01	44.43	15.42
	(0.00)	(0.00)	(0.00)	(0.00)
0.30	100.77	49.89	28.74	13.67
	(0.00)	(0.00)	(0.00)	(0.00)
0.40	16.73	8.28	11.64	11.76
	(0.00)	(0.00)	(0.00)	(0.00)
0.50	11.84	5.86	0.77	10.55
	(0.00)	(0.00)	(0.46)	(0.00)
0.60	78.65	38.93	12.45	11.85
	(0.00)	(0.00)	(0.00)	(0.00)
0.70	152.65	75.57	52.78	16.35
	(0.00)	(0.00)	(0.00)	(0.00)
0.80	207.86	102.90	97.75	21.38
	(0.00)	(0.00)	(0.00)	(0.00)
0.90	245.36	121.46	127.27	24.67
	(0.00)	(0.00)	(0.00)	(0.00)
1.00	270.77	134.04	142.14	26.33
	(0.00)	(0.00)	(0.00)	(0.00)
Average θ	11.54	5.71	19.75	12.67
	(0.00)	(0.00)	(0.00)	(0.00)

Notes:

[#]: SUR Regression. Two-step Estimation.
[##]: OLS Regression. Two-step Estimation.
[###]: OLS Regression. One-step Estimation. Power defined by male share of income.
[####]: IV Regression. One-step Estimation. Power defined by male share of income.
p-values in parenthesis
χ^2 test for Model I. F tests for Models II, III and IV.

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Appendix: Table A1: First Stage Estimation for IV Regression
Dependent Variable: Share of Male Earned Income

	Coefficient Estimate
Relative Share of Male Education	1.1710 (3.85)
Log of Household Income	-0.0099 (-2.02)
Number of Usual Residents in the Household	0.0180 (2.03)

Notes: t-values in parenthesis
The first stage regression controls for other exogenous variables in the system.

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