Determinants of Household Saving in Australia*

Mark N. Harris, Joanne Loundes and Elizabeth Webster
Melbourne Institute of Applied Economic and Social Research
The University of Melbourne

Melbourne Institute of Applied Economic and Social Research
The University of Melbourne
Parkville, Victoria 3052 Australia
Telephone **(03) 9344 5330**
Fax **(03) 9344 5630**
Email **melb.inst@iaesr.unimelb.edu.au**
WWW Address **http://www.ecom.unimelb.edu.au/iaesrwww/home.html**

Abstract

This paper uses a unique survey of consumers (incorporating the Melbourne Institute Household Savings Survey and the Westpac-Melbourne Institute Survey of Consumer Sentiment) to examine the determinants of Australian household saving. Unit records from 17,700 Australian households are available, which enables the incorporation of a range of household characteristics that may be important factors for saving behaviour, but which are not typically available to researchers undertaking macroeconomic analyses. An ordered probit estimation method is used, and the results support the view that current incomes are perhaps the most important determinant of saving. However, it can also be seen that demographics and householders level of economic optimism play a key role.

1. Introduction

This paper uses a unique survey of consumers (incorporating the Melbourne Institute Household Savings Survey and the Westpac-Melbourne Institute Survey of Consumer Sentiment) to examine the determinants of Australian household saving. Unit records from 17,700 Australian households are available, which enables the incorporation of a range of household characteristics that may be important factors for saving behaviour, but which are not typically available to researchers undertaking macroeconomic analyses. For example, the distribution of savings across households is important to governments who uphold an economic safety net function, such that an even distribution of assets across families should lessen the burden on welfare payments that buffer against unforeseen contingences. Additionally, as an economy's population ages, it may lower the dependence on government aged pensions. Changing household demographics can also play a role in shaping national saving. Perhaps most importantly however is that an understanding of household saving behaviour can assist policy makers in assessing the likely impact on saving of changes in economic circumstances facing households [both anticipated (the introduction of the GST or retirement) and unanticipated (an unexpected depreciation of the exchange which adversely influences prices)].

High savings ratios do not of course necessarily imply high levels of saving, for the latter also depends on the level of national income.[1] Nor are higher saving ratios of unlimited benefit, for they come at the cost of lower current consumption ratios. If, for example, households tend to save more if they are pessimistic about their economic future, then a negative external shock to the economy may be compounded by the associated contraction in consumption. It is a question of balance.

Most theories of saving are developed in terms of individuals' motives, but (in Australia at least) the majority of empirical work has utilised aggregate times series data. In some cases this is because of a paucity of reliable household information sets on Australian household saving ((Defris 1977); (Lattimore 1994); (Lester 1996)), although in others it has been suggested that private rather than

---

[1]The 'paradox of thrift' dilemma can be managed however by compensating stimulus to consumption or other sources of final demand.

household saving *per se* is a more appropriate focus for macro policy purposes (Edey and Britten-Jones 1990). These studies find that household disposable income provides most of the explanatory power; the inclusion of variables such as interest rates and wealth is found to have little or no effect.[2] Aggregate analysis also suggests that consumption smoothing behaviour is only important over relatively short periods (Edey and Britten-Jones 1990).

More recently, there has been a shift in the empirical literature from aggregate time series studies toward individual household analysis, partly because of the observation that very little has been learned about individual saving behaviour from time series work. Aggregate analysis tends to ignore demographics (primarily because they change only gradually in the aggregate), but it is exactly such demographics that can be potentially important sources of variation in saving at the micro level (Browning and Luscardi 1996). This was one of the original motivations behind establishing an Australian household saving survey, as well as the view that survey data are more likely to quickly pick up information on changes in household behaviour in response to changes in economic or political conditions (McDonnell and Williams 1994).

Section 2 further describes the data set to be utilised and presents cross tabulated results on households stated motives for saving. An outline of the models to be used is given in Section 3. These models incorporate a range of variables that were chosen to reflect some of the key determinants of savings as outlined in such hypotheses as the life-cycle hypothesis, the absolute income hypothesis, the relative income hypothesis, and precautionary motives for saving. The results from the ordered probit estimation are then discussed in Section 4. One of the difficulties with interpreting ordered probit estimates is that the impact of a change in an explanatory variable on the intermediate classification of the dependent variable cannot be determined *a priori*. In order to overcome this problem, some extra analysis is presented that investigates this intermediate impact. Section 5 finishes with a short conclusion.

---

[2]One of the major criticisms of this work is that imputing savings from national accounts estimates includes a high degree of measurement error, a problem that is also encountered in the cross sectional Household Expenditure Survey.

2. Data set

The Melbourne Institute Household Saving Survey is conducted by telephone, and the questions are put to a random sample of 1200 households each quarter.[3] The survey records several qualitative measures on the extensiveness of household saving, reasons for saving and asset allocation. In addition it includes information on the age of the respondent, household incomes, respondents gender and the presence of children. The data used in the estimation were derived from the pooled results of the quarterly surveys over the period August 1994 to February 1999, giving a total sample size of 17,700 people 18 years and over across Australia.

To complement the formal estimation of what influences household saving, self enumerated reasons for saving from the survey are given in Table 2.1. Such an exercise is important, because characterising why people save can have implications for the amount they save. The top three motives are for retirement (a life-cycle motive), holidays, and a rainy day (the precautionary motive). There is a relatively large break between the top three and the next four reasons for saving, which are to invest in the family home, pay off debt, education and to buy durables. The bequest motive is relatively unimportant.

Comparing across income groups, there is a substantially higher proportion of low-income individuals (under $20,000 per annum) who have no savings. Of those who do save, the most important reason is for precautionary factors (rainy day), followed by the retirement and holiday motives. Compared to the other income categories, saving for educational purposes rates very poorly. As income increases, saving for retirement becomes the most important reason for saving, although for households with an annual income of between $21,000 and $40,000, precautionary saving still ranks quite highly.

Table 2.2 presents data on motives for saving by age group, and whether or not there are children in the household. For the youngest age group (18 to 24) holidaying and buying durables are the most important reasons for saving. Middle aged respondents (25 to 44) also rate holidays as a high priority, followed closely by investing in the family home and saving for retirement. Saving for education

---

[3]The sample was stratified by sex and location and age was randomised. The Northern Territory was not included.

3

Table 2.1: Main reasons for saving by income category (per cent of households stating each reason, 1994 to 1999) [a]

	Total	Under $20k	$20k to $40k	$40k to $60k	$60k and over
Sample size	17690	4148	5373	3911	4258
Retirement	34	22	33	40	44
Holiday	31	20	27	36	40
Rainy day (e.g. unemployment)	29	29	30	29	26
Buy, improve, upgrade home	22	10	21	27	30
Pay off debt	21	13	21	25	24
Education	20	9	21	25	22
Buy durables (e.g. car)	17	10	17	19	21
Bequest	9	7	9	10	8
Other	8	8	7	7	8
Don't know	1	1	1	0	0
No saving	12	24	11	6	5

Source: Melbourne Institute Household Savings Survey, unpublished data

Notes: [a]Multiple reasons were permitted.

is also considered relatively important for this age group. Saving for retirement is the single most important reason for saving for respondents over the age of 45. This age group also appears more risk averse than other age groups; precautionary saving ranks second, whereas it only ranks 6th for the 18 to 24 year olds and 5th for the 25 to 44 year olds. A higher proportion of this category has no savings at all, which is not surprising given that this group contains a number of retired individuals. Compared with the youngest respondents, buying durables does not rate very highly for people over the age of 25.

The primary difference in saving motives between households with and without children is in saving for educational purposes. Two out of every five respondents that had children present in the household indicated they saved for this purpose, compared to only one in fourteen for households without children. Paying off debt also rated as a high priority for households with children compared to those without children.

In sum, householders stated reasons provides further depth on the motives for saving, and give a useful counterpoint for the indirect evidence from the regression analysis. These results indicate that income is going to be an important factor in determining saving, but also add support to the life cycle and precautionary hypotheses.

Table 2.2: Main reasons for saving by income category (per cent of households stating each reason, 1994 to 1999) [a]

	18 to 24	25 to 44	45 plus	No children	Children
Sample size	1467	8337	7886	10552	7138
Holiday	37	32	27	32	29
Buy durables (e.g. car)	34	19	10	15	20
Buy, improve, upgrade home	29	31	10	20	25
Pay off debt	27	28	12	17	28
Retirement	26	31	41	35	33
Rainy day (e.g. unemployment)	25	29	29	28	29
Education	18	29	9	7	40
Bequest	6	7	8	6	13
Other	10	7	7	8	7
Don't know	0	0	1	1	0
No saving	4	9	16	12	11

Source: Melbourne Institute Household Savings Survey, unpublished data

Notes: [a] Multiple reasons were permitted.

3. Model

One of the complicating factors for theorists in providing a framework for empirical analysis is that a wide range of motives for saving exist, both across populations at a given point in time, and for an individual over a period of time. Several motives can also be in effect at the same time, such as in the case where a household saves for retirement (the life-cycle hypothesis) as well as for unexpected shocks to income (the precautionary motive) (Browning and Luscardi 1996). The independent variables used here were chosen to reflect features of some of the standard theories of household saving, such as the absolute income hypothesis, the custom features of the relative income hypothesis, the life cycle hypothesis and a version of the precautionary hypothesis[4]. The model estimated in this paper is of the form, $s^* = \Sigma \beta_i x_i + \varepsilon$, where s^* is an unobservable index of household saving, x_i are the independent household/individual characteristics and ε is an error term.

The variable of interest that is used formally to examine the determinants of household saving is the respondents' answer to the question, "which one of the following statements best describes the present situation of your household". The available responses are 'running into debt', 'having to draw on our savings', 'managing to make ends meet on our income', 'saving a little' and 'saving a lot'.

---

[4]Suitable information was not available to examine elements of the permanent income hypothesis.

The answers are used as a proxy for a saving ratio, as it is assumed that respondents answers are relative to their income. As these responses are (ordered) categorical (i.e. the choices range from 0 to 4), the estimation method used here is an ordered probit. For identification purposes, all boundary parameters can be estimated without a constant, or, if a constant is included, the first boundary parameter must be restricted to zero (the latter method is utilised here). Additionally, the error term is specified as having a mean of zero and a variance of one.

The model assumes that the observed saving response, s, is related to an underlying latent variable—that of the actual monetary amount describing the household's financial position with regard to savings and debt, s^*. Saving is determined not only by s^*, but also by its relationship to the boundary parameters, μ_j which jointly determine the observed outcome. That is, given the five alternatives outlined above, the following is observed

$$
s = \begin{cases}
0 & \text{if } s^* \leq 0, \\
1 & \text{if } 0 < s^* \leq \mu_1, \\
2 & \text{if } \mu_1 < s^* \leq \mu_2, \\
3 & \text{if } \mu_2 < s^* \leq \mu_3, \\
4 & \text{if } \mu_3 \leq s^*.
\end{cases}
$$

Dependent on the hypothesis of interest, s^* is a function of certain personal (and macroeconomic) variables $\underline{x}_i$, with unknown weights $\underline{\beta}$. Assuming a linear relationship and a random sample of N individuals $i = 1, \ldots, N$, the following is obtained

$$
s_i^* = \underline{x}_i' \underline{\beta} + u_i. \tag{3.1}
$$

If the u_i of equation (3.1) are independently standard normally distributed, the probability that individual i "chooses" alternative j ($j = 0, \ldots, J-1)$[5] is

$$
\begin{aligned}
\text{Prob}\,(s_i = 0) &= \Phi\left(-\underline{x}_i'\underline{\beta}\right), \\
\text{Prob}\,(s_i = 1) &= \Phi\left(\mu_1 - \underline{x}_i'\underline{\beta}\right) - \Phi\left(-\underline{x}_i'\underline{\beta}\right), \\
\text{Prob}\,(s_i = 2) &= \Phi\left(\mu_2 - \underline{x}_i'\underline{\beta}\right) - \Phi\left(\mu_1 - \underline{x}_i'\underline{\beta}\right), \\
\text{Prob}\,(s_i = 3) &= \Phi\left(\mu_3 - \underline{x}_i'\underline{\beta}\right) - \Phi\left(\mu_2 - \underline{x}_i'\underline{\beta}\right), \text{ and} \\
\text{Prob}\,(s_i = 4) &= 1 - \Phi\left(\mu_3 - \underline{x}_i'\underline{\beta}\right),
\end{aligned}
$$

[5]J is the total number of alternatives, here $J = 5$.

with the requirement that $0 < \mu_1 < \ldots < \mu_{J-2}$ and where Φ is the standard normal cumulative distribution function. Maximum likelihood parameter estimates are obtained by maximising the likelihood

$$\log L = \sum_{i=1}^{N} \sum_{j=0}^{J} z_{ij} \log (P_{ij}) \qquad (3.2)$$

with respect to $\underline{\beta}$ and $\underline{\mu}$, where z_{ij} is an indicator variable equal to unity if individual i chooses alternative j and zero otherwise.

The variables used in the estimation (along with their mean values) are contained in Table 3.1, and a full explanation follows. Most are entered as zero-one indicator (dummy) variables. Variables that are ordered qualitative in nature are also entered as dummies to avoid forcing quantitative effects onto a qualitative variable.[6]

The household saving ratio is measured on the 5 point scale discussed above.[7] This variable could be criticised on the grounds that it is a self-reported qualitative measure, and that there is no way of telling what types of saving respondents have included in their views on how much they are saving (such as superannuation or mortgage repayments). However it can still be considered a useful proxy given that it avoids the measurement bias found in any of the available direct measures of income, consumption and saving. Household incomes were grouped into $10,000 per annum sets, starting from $21,000 or below, up to $100,000 and over. Respondent's age was grouped as 18 to 24, 25 to 34, 35 to 44, 45 to 49, 50 to 54, 55 to 64 and 65 years and over. The rate of interest was the average quarterly rate offered by major trading banks on fixed deposits. Children were measured by the number of people living in the household under the age of 18. There were two variables to indicate comparative wealth. The first was a dummy variable to indicate whether the respondent wholly or partially owned a house. The second was a dummy variable to indicate whether their main asset holdings were in the form of shares, bonds, debentures, managed trusts, holiday homes or investment properties.

---

[6]The main drawback of this is that sources of variation in the data are potentially being lost.

[7]Theoretically, savings should also include debt repayments, but it has not been possible to include these factors in the dependent variable given the ordinal nature of the survey response.

Table 3.1: Sample means

	Means	Standard Deviation
Male	51	50.0
Interest rate	6	1.6
Optimism	1	0.2
Below median income	41	49.2
Above median income	38	48.5
Income	44538	29001.0
18-24 years old	8	27.6
25-34 years old	21	40.9
35-44 years old	26	43.8
45-49 years old	11	31.0
50-54 years old	9	28.3
55-64 years old	11	31.6
Home owner	80	40.3
Wealth	36	47.9
Number of children	1	1.2
Children present	40	49.1
Urban dweller	58	49.4
New South Wales	27	44.4
Victoria	24	42.9
Queensland	17	37.3
South Australia	13	33.6
Western Australia	13	33.3

According to the relative income hypothesis, people spend according to what is normal for their reference group and past consumption levels (i.e. they save if income is high relative to their peers or income has risen and vice versa). In order to calculate relative income, the peer group for respondents was proxied using the median income level for the respondents occupation, as measured by the survey. A variable was then constructed to denote whether household income was above, below or at this median occupational income level. Occupations were classified at the major Australian Standard Classification of Occupations (1st edition) level. As the data are cross sectional, it was not possible to construct a variable for that enabled the habit aspect of Duesenberry's hypothesis to be examined.

There is evidence to suggest that subjective factors are an important determinant of household savings (Carroll and Samwick 1995, Browning and Luscardi 1996), and the primary problem has been finding an observable and exogenous variable to signify the householders' degree of uncertainty or economic pessimism. Typically, these studies use indirect measures of the subjective motives for savings such as income variance and insurance coverage. However, the data set used here incorporates a direct question on consumer sentiment which allows household saving to be cross classified against their degree of economic optimism/pessimism. This precautionary variable was calculated as an average of responses to questions about the future of family finances, the Australian economy over the coming year and over the next 5 years, and expectations about unemployment over the next year. Responses were rated on a 5 point scale. These responses were weighted evenly around the neutral response of 3 and summed. Unfortunately, this measure of expectations shows a significant positive correlation with the householder's current circumstances and is thus likely to be endogenous to the dependent variable. To obtain a variable that was free from these effects, the constructed expectations variable was divided by two responses about the householder's current economic circumstances. These referred to householders financial situation over the last year and their views on current buying conditions. The resulting variable 'optimism' should give a measure of householders optimism regarding future economic prosperity for themselves and the Australian economy, given their current circumstances.

4. Results

Table 4.1 gives the results for the model that conditions on relative income, and table 4.2 presents results conditioning on the absolute income levels of respondents. Care should be taken when interpreting coefficients on ordered probit estimates, as they do not represent marginal values. A positive and significant coefficient indicates that a particular characteristic implies a greater probability of being in a higher saving category, and vice versa for a negative and significant coefficient. Additionally, the absolute magnitude of the coefficients cannot be given any meaning, because of the identifying restriction that the variance on ε equals one.

The positive and significant coefficient on the male variable may possibly reflect the accepted view that men have higher saving in the form of superannuation than women. A cross classification of gender by size of household indicates that the male is more likely to be the respondent for two and four-person households, which could suggest that the male respondent knows more about the financial position of the household (i.e. the size of superannuation contributions) than the female respondent.

Changes in the real rate of interest are hypothesised to have an ambiguous effect on the level of saving, because there is both an income and substitution effect.[8] Empirical estimation usually finds at most only weak evidence of a small positive impact on aggregate saving ((Callen and Thimann 1997); (Edey and Britten-Jones 1990)). The results in Table 4.1 indicate that the interest rate has no significant effect on Australian household saving ratios. It is more likely that a change in interest rates will change the mix of saving, but may not necessarily change the level.

Following Keynes's early emphasis on the influence of expectations on savings decisions, there has been a recent spate of models in the USA which have sought to test the sensitivity of households savings ratios toward subjective factors, both cyclical and irregular ((Browning and Luscardi 1996); (Carroll and Samwick 1998); (Juster and Taylor 1975)). Specifically, these precautionary theories maintain that the more uncertain or pessimistic are consumers about the future, the higher are

---

[8]See Keynes ([1936], 1973: Ch 8).

Table 4.1: Nested Model - Income Variable Omitted

	Coefficient	Standard Error
Constant	1.911	0.080**
×1 (male)	0.150	0.016**
Interest rate	-0.009	0.005
Optimism	-0.644	0.049**
×1 (Rel. low income)	0.001	0.022
×1 (Rel. high income)	0.394	0.022**
×1 (18-24 years old)	0.406	0.038**
×1 (25-34 years old)	0.401	0.033**
×1 (35-44 years old)	0.222	0.033**
×1 (45-49 years old)	0.108	0.037**
×1 (50-54 years old)	0.095	0.037**
×1 (55-64 years old)	-0.047	0.035
Home owner	0.101	0.021**
Wealth	0.365	0.018**
# of children	-0.040	0.012**
×1 (children)	-0.185	0.030**
×1 (urban area)	0.064	0.017**
×1 (New South Wales)	0.013	0.037
×1 (Victoria)	-0.009	0.037
×1 (Queensland)	-0.036	0.039
×1 (South Australia)	-0.049	0.040
×1 (Western Australia)	-0.006	0.040
μ_1	0.565	0.014**
μ_2	1.877	0.018**
μ_3	3.326	0.022**
Log Likelihood	-21,419.85	

Notes: ** and * significant at 5% 2-sided and 1-sided levels, respectively.

their savings in order to meet both unforeseen and anticipated contingencies. As such, it is expected that the sign on the coefficient of the precautionary variable 'optimism' will be negative. The results in Table 4.1 show that this coefficient is negative and significant, indicating that if individuals are pessimistic about their future financial situation and economic conditions, they are likely to be saving more.

The relative income hypothesis (Duesenberry 1949) suggests that tastes, the parameters of the utility function, are endogenous to past and present saving decisions. In particular, tastes are shaped by social comparisons (custom) and past consumption decisions (habit). As a result, the saving ratio is posited to depend on the household's income relative to their peers and current income relative to past income but not absolute income levels. Due to the cross sectional nature of the data, it is not possible to examine current income relative to past income. The results on the distribution of income are given in Table 4.1 and show that the coefficient on 'relative high income' significant and, as expected, positive, indicating that this group is more likely to be represented in the 'saving a lot' category. This is in line with other microeconomic empirical work on the determinants of household savings, which find that relative incomes are the most important determinant of the saving ratio (Browning and Luscardi 1996). At the other end of the income scale, the coefficient on 'relative low income' is not significantly different from the omitted category, relative median income. Duesenberry (1949) suggested that families with low relative occupational incomes would have to balance their budgets on average, with dissaving only being a temporary phenomenon.

Modigliani and Brumberg's (1953) life cycle hypothesis contends that saving and dissaving are undertaken to smooth consumption and utility as yearly income varies over the stages of the life-cycle. Over the course of a life time, young agents borrow to consume in advance of future income, repay their debt and save through the middle years (at which point they have a rising saving ratio) and finally, draw down their savings after retirement.[9] The coefficients on the age parameters

---

[9]Identifying life cycle profiles however is complicated by 'cohort effects'; for example, a group of 45 year olds in 1979 may have different savings patterns to a group of 45 year olds in 1999. See, for example, (Attanasio 1998). Additionally, different members of a household may have different propensities to save. See, for example, (Browning 1994).

indicate that saving is positive relative to the omitted category (individuals aged 65 years and over) with the exception of respondents aged between 55 and 64.

Assets based theories of savings ((Houthakker and Taylor 1970); (Tobin 1951)) are an adaptation of the absolute income hypothesis. It includes a stock adjustment process so that saving is positive when the level of wealth falls below the optimal level and negative otherwise, implying that households have a target wealth to income ratio. Although it is not possible to examine optimal levels of wealth for each household, it is possible to look at whether holding wealth or owning a home influences saving ratios. From these estimates it appears that home owners are likely to be saving more. Although the saving question does not explicitly include mortgage repayments as savings, there is a possibility that respondents view such repayments as saving, and may therefore indicate that they are 'saving a lot'. Respondents indicating they had any form of wealth also appeared more likely to be in the higher saving categories, and could be attributed to the flows of income from this stock of wealth going back in to some form of saving.

Given that the saving and consumption needs of households with children are different to those without ((Kooreman and Wunderink 1997); (Pashardes 1991)), it is expected that the presence of children will influence Australian household saving ratios. Empirical estimates for the USA indicate that the saving of couples is negatively correlated with the number of children and the age of the youngest child (Wang 1994). The reasoning (apart from the obvious increased implied expenditure) is that the addition of children to the household increases the price of time. This makes leisure more expensive, thereby causing couples to increase their labour force participation, consume more time saving goods and services, and save less. Browning and Luscardi (1996, p 1815) also corroborate these results, reporting that saving ratios are higher for couples with no children, lower for households with children, and the least for lone parents. As can be seen from Table 4.1, the coefficient is negative and significant for both the number of children and whether or not there are children in the household, which is in line with the evidence mentioned above. This indicates that the presence of children has a detrimental effect on the probability of having a higher saving ratio, and the more children a household has, the more difficulty a household has in saving anything.

13

Over time, this may have implications for aggregate saving if — as is the case with a number of industrialised countries — fertility rates decline to the extent where there are significantly fewer households with larger numbers of children.

The boundary parameters (μ_1 to μ_3) are strongly significant, indicating evidence of ordering in the data. In order to capture any possible heterogeneity relating to location, State dummies were also included, but proved to be insignificant. However, the coefficient on the variable indicating whether the respondent resided in an urban area was significant, although this may reflect the observation that urban residents have a higher disposable income.[10]

Table 4.2 presents results conditioning on the absolute income levels of respondents. The archetypal 'Keynesian' absolute income hypothesis depicts saving as a positive linear function of income, wealth and interest rates, with a positive intercept. It is generally recognised that relatively high income earners account for a large share of aggregate savings ((Carroll 1998); (Callen and Thimann 1997)) and that a substantial proportion of households never accumulate large stocks of financial wealth ((Poterba and Samwick 1997); (Browning and Luscardi 1996)). Evidence from the USA suggests that households with higher levels of lifetime income also tend to have higher lifetime savings ratios (Carroll 1998), and estimates for Australia indicate that the wealthiest 10 per cent of the population hold more than half of Australian wealth (Dilnot 1990). In their review of the literature, Browning and Luscardi (1996) suggest that saving is usually negative for the first and second income quintile and highest in the top quintile. In line with evidence from elsewhere, the coefficient on the absolute income variable is (as expected) positive and significant, suggesting that saving ratios rise with the level of income. It has been suggested that lower saving may in fact be an optimal choice for low-income households if welfare payments are means-tested (Hubbard, Skinner, and Zeldes 1995). Other evidence from Australia indicates that a relatively large share of individuals who are not working have no savings at all (Loundes 1999). This is consistent with evidence from other OECD countries, where unemployment is so detrimental to saving that the 'lower income' effect outweighs the 'need for precautionary saving' effect (Callen and Thimann 1997).

---

[10]Remembering that this version of the model does not condition on levels of income.

14

Table 4.2: Nested Model - RIH Variables Omitted

	Coefficient	Standard Error
Constant	1.822	0.078**
×1 (male)	0.070	0.017**
Interest rate	-0.003	0.005
Income	0.142	0.003**
Optimism	-0.576	0.049**
×1 (18-24 years old)	0.220	0.038**
×1 (25-34 years old)	0.164	0.033**
×1 (35-44 years old)	-0.026	0.034
×1 (45-49 years old)	-0.140	0.037**
×1 (50-54 years old)	-0.095	0.038**
×1 (55-64 years old)	-0.131	0.036**
Home owner	0.030	0.021
Wealth	0.252	0.018**
# of children	-0.029	0.012**
×1 (children)	-0.172	0.030**
×1 (urban area)	0.004	0.017
×1 (New South Wales)	-0.044	0.037
×1 (Victoria)	-0.020	0.037
×1 (Queensland)	-0.045	0.039
×1 (South Australia)	-0.034	0.040
×1 (Western Australia)	-0.031	0.040
μ_1	0.575	0.014**
μ_2	1.926	0.018**
μ_3	3.438	0.023**
Log Likelihood	-20,905.55	

Notes: ** and * significant at 5% 2-sided and 1-sided levels, respectively.

'Residual' hypotheses of saving (Marglin 1975) maintain that apart from the decision to save for a house, most household saving is the residual of income after consumption and does not emanate from a deliberate decision to save.[11] Such an argument implies that, a priori, low-income households will save less than high income, simply because they have a lower disposable income (although it should be noted that the relationship between saving and income is two-way). This proposition would be difficult to test, because although this may be the case, there are very few households who are likely to explicitly state, even when asked why they save, that this is the reason they currently have any savings.

Conditioning on absolute incomes does produce some differences with the results presented in Table 4.1. The major difference concerns the estimated coefficients on the age variables. In this model, the coefficient on individuals over the age of 45 are negative and significant. What this implies is that absolute incomes account for the bulk of saving once an individual is over the age of 35. Once the absolute level of income is conditioned on for these age groups, it is found that older individuals are actually more likely to have a lower saving rate than the youngest. The other changes in the estimates are that home ownership and residing in an urban area are no longer significant explanators of saving ratios, which suggests that income levels account for the bulk of the explanatory power of these two variables in the previous estimation.

4.1. Effects of Selected Variables on Saving Patterns

In an ordered probit model, the marginal effects of explanatory variables on the choice probabilities are not the estimated coefficients. Moreover, although a positive coefficient unambiguously shifts probability mass out of the 'running into debt' option and into 'saving a lot', it is unclear what happens to probabilities in the other three options without undertaking further analysis. Essentially the technique utilised to examine these effects involves estimating the choice probabilities for two given sets of personal characteristics, where the two sets differ by virtue of the variable(s) under consideration. The difference in these two sets of

---

[11]According to Keynes ([1936], 1973: 97) 'satisfaction of immediate primary needs of a man and his family is usually a stronger motive than the motives towards accumulation'.

probabilities can be interpreted as the marginal effect on the choice probabilities of this (these) variable(s). The variable of interest is given a range of "likely" values (zero/one for dummy variables), whilst the remaining explanatory variables are evaluated at their sample means.[12] Such an exercise was undertaken and the results illustrated in Figures 1 to 8 below.

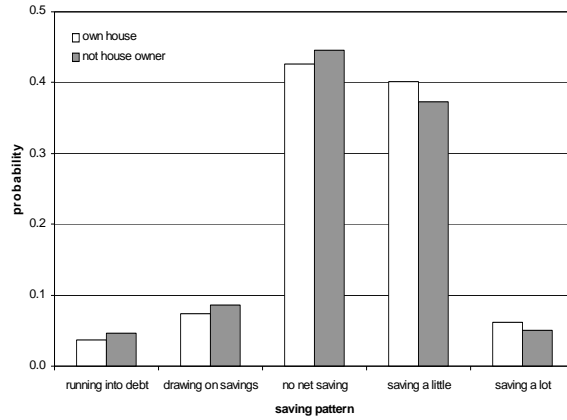Figure 4.1: Effect on the saving ratio of increasing the interest rate from 1 to 10 per cent.
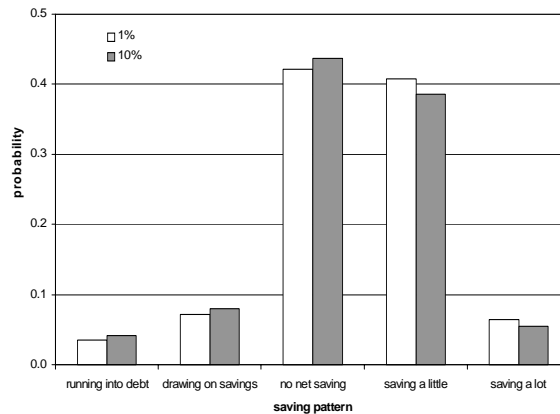
In line with the results presented earlier, Figure 4.1 indicates that a relatively large change in the interest rate (from 1 to 10 per cent) has virtually no effect on saving ratios. Figure 4.2 shows that home ownership gives similar results. However, more interesting estimates are obtained when the other variables are examined.

A change in optimism also has an impact on the intermediate saving choices. Figure 4.3 illustrates that nearly 70 per cent of 'optimistic' respondents are represented in the bottom three categories, compared just over 40 per cent of the least optimistic. Based on these estimates, a negative shock to the economy that

---

[12]In terms of the parameters under analysis here, the likely values are: 1% and 10% for the interest rate; 0.5 and 1.5 for the degree of optimism; below and above median income; 7 age groups ranging from 18 to 24 up to 65 plus; wealth and no wealth; 0, 1 and 5 children; household income up to $20k, between $51 and $60k and over $100k; and whether the individual owns their own home or not.

Figure 4.2: Effect on the saving ratio of home ownership.

increases consumer pessimism will increase the number of people saving by a considerable proportion.

Figure 4.3: Effect on the saving ratio of an increase in optimism.*

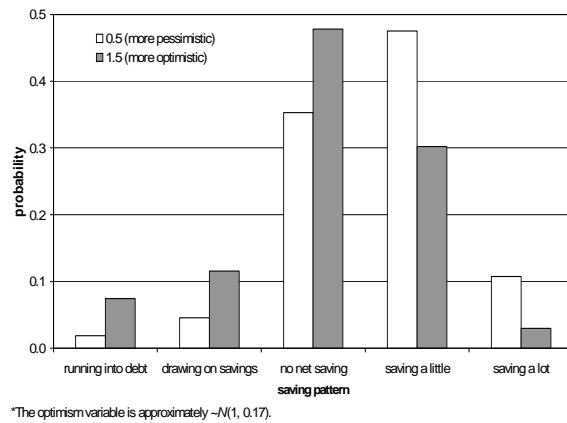*The optimism variable is approximately ~N(1, 0.17).

Figure 4.4 shows how being in different age groups affects the saving ratio. These results belie the expected profile, that is, the youngest and oldest age groups will be disproportionately represented in the bottom three saving categories, and the middle age group will have a higher share of the top two categories. However, conditioning on incomes removes this effect, resulting in the observation that

18

young individuals are saving more than their elders.

Figure 4.4: Effect on the saving ratio of different age groups.
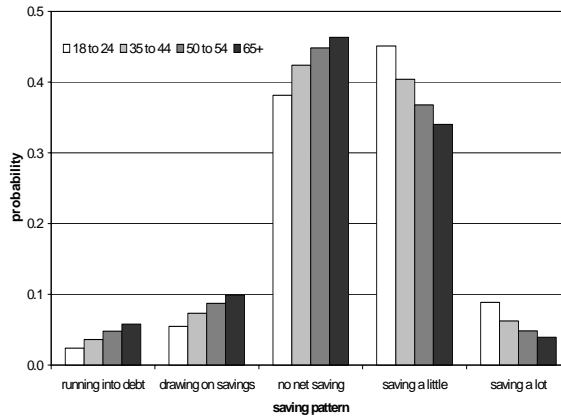
Figure 4.5: Effect on the saving ratio of the number of children.
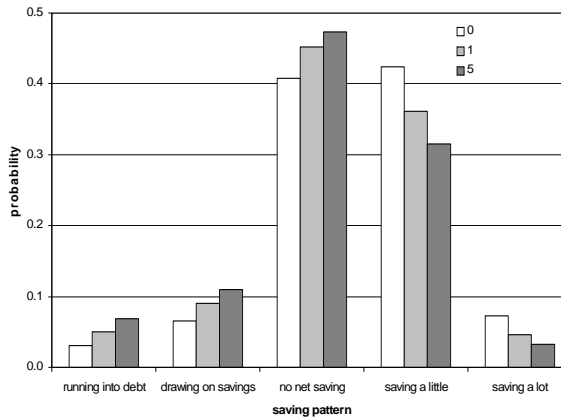

Figure 4.5 illustrates the impact on saving if there are children in the household. Having one child increases the chance if the household only managing to 'make ends meet' by about 5 per cent, as compared to the case where there are no children present. Households with five children are not particularly worse off than households with one child, as the chance of being in the bottom three categories

19

is only around 6 per cent higher. There is however a relatively large difference in being represented in the 'saving a little' category depending on whether the household has no children, one child or five children, with about a five per cent difference between each of these groups.

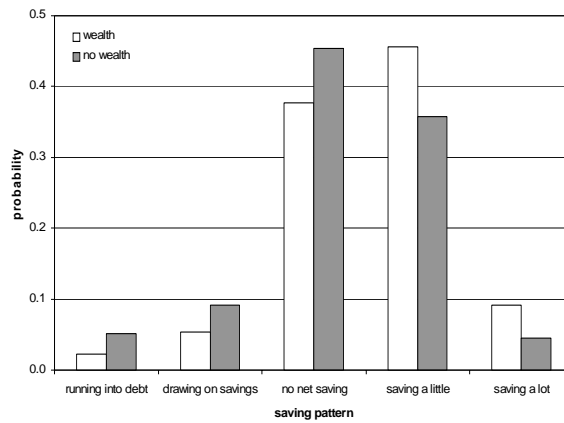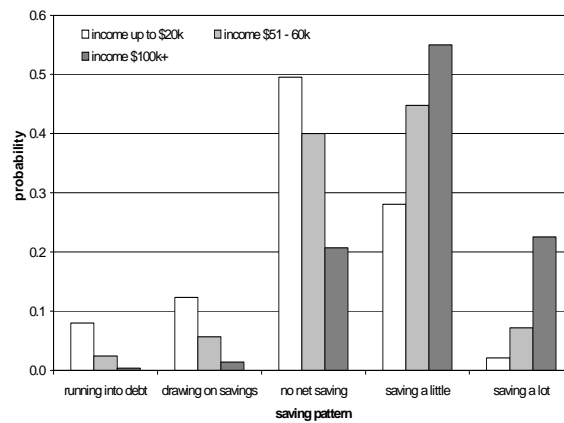Figure 4.6: Effect on the saving ratio of wealth.

Figure 4.7: Effect on the saving ratio of different income levels.

The estimates on the wealth variable shows a considerable impact on the probability of shifting between saving categories. The bulk of the movement is

in the 'no net saving' and 'saving a little' categories, with wealthier individuals around 10 per cent more likely to be 'saving a little' than respondents with no wealth, and about 8 per cent less likely to be 'managing to make end meet'.

Absolute income levels have a large impact on saving rates, as is illustrated in Figure 4.7. Less than one quarter of households earning over $100,000 are in the 'no net saving' category or below, compared to 70 per cent of households who earn up to $20,000. More than 1 in 5 high income households are 'saving a lot', which is by far the largest share of any of the categories presented here.

Figure 4.8 shows the effect of having above or below the median level of income (for the respondents occupation) on the probability of falling within a particular saving bracket. Households with a low relative income for their occupation are 15 per cent more likely to be running into debt, drawing on their savings, or just managing to make ends meet as compared to the relatively high in come households.

Figure 4.8: Effect on the saving ratio of differences in relative occupational income.
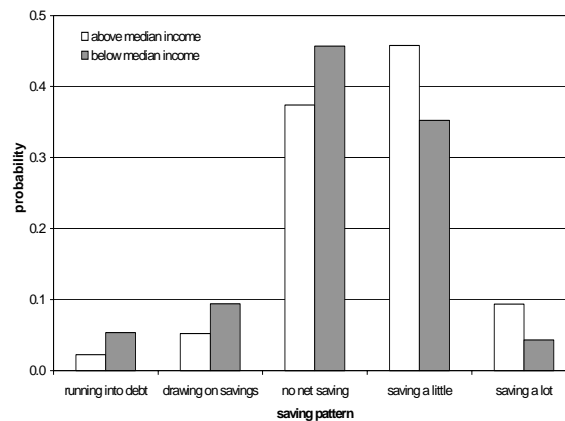
5. Conclusion

The analysis of Australian household saving data support the view that incomes are perhaps the most important determinant of saving. However, it can also be seen that demographics and householders level of economic optimism play a key

role. Several issues can be addressed using these results. The observation that saving rates are positively influenced by household income levels (relative and absolute) and wealth could suggest that a more even distribution of income across the population may encourage greater saving. From a macroeconomic viewpoint, these estimates also support the general consensus that the level of the interest rate has little or no influence on household saving ratios. Additionally, they suggest that precautionary factors are an important determinant of household saving, implying that shocks to the economy that unduly influence consumer sentiment may lead to a temporary change in saving levels. The ability to draw numerous inferences from this analysis that is not readily available from the standard time series aggregates suggests that there is some merit in examining household level data.

References

Attanasio, O. P. (1998): "A Cohort Analysis of Saving Behaviour by U.S. Households," Journal of Human Resources, 33(3), 575–609.

Browning, M. (1994): "The Saving Behaviour of a Two-Person Household," Working Paper 9406, Department of Economics, McMaster University.

Browning, M., and A. Luscardi (1996): "Household Saving: Micro Theories and Micro Facts," Journal of Economic Literature, XXXIV(4), 1797–1855.

Callen, T., and C. Thimann (1997): "Empirical Determinants of Household Saving: Evidence from O.E.C.D. Countries," Working Paper 181, International Monetary Fund.

Carroll, C. D. (1998): "Why Do the Rich Save so Much?," Working Paper 338, Department of Economics, John Hopkins University.

Carroll, C. D., and A. A. Samwick (1998): "How Important is Precautionary Saving?," Review of Economics and Statistics, 80(3), 410–19.

Defris, L. V. (1977): "Australian Consumer Expectations Evaluations, Uncertainty and the Saving Ratio," Australian Economic Review, 1st Quarter, 36–42.

Dilnot, A. W. (1990): "The Distribution and Composition of Personal Sector Wealth in Australia," Australian Economic Review, 1st Quarter, 33–40.

Duesenberry, J. S. (1949): Income, Saving and the Theory of Consumer Behavior. Harvard University Press, Cambridge.

Edey, M., and M. Britten-Jones (1990): "Saving and Investment in the 1980s," in The Australian Macro-Economy in the 1980s, ed. by S. Grenville, pp. 79–145, Sydney. Reserve Bank of Australia, Reserve Bank of Australia.

Houthakker, H., and L. Taylor (1970): Consumer Demand in the United States. Harvard University Press, Cambridge, 2nd edn.

Hubbard, R. G., J. Skinner, and S. P. Zeldes (1995): "Precautionary Saving and Social Insurance," Journal of Political Economy, 103(2), 360–99.

Juster, F. T., and L. D. Taylor (1975): "Personal Savings in the Postwar World: Implications for the Theory of Household Behaviour," American Economic Review, 65(2), 203–209.

Kooreman, P., and S. Wunderink (1997): The Economics of Household Behaviour. Macmillan Press, Houndmills, Basingstoke.

Lattimore, R. (1994): "Australian Consumption and Saving," Oxford Review of Economic Policy, 10, 54–70.

Lester, L. H. (1996): "The Saving to Income Ratio," Economic Analysis and Policy, 26, 59–76.

Loundes, J. (1999): "Household Saving Behaviour in Australia," Working Paper 17/99, Melbourne Institute of Applied Economic and Social Research, University of Melbourne, Melbourne.

Marglin, S. A. (1975): "What Do Bosses Do? Part II," Review of Radical Political Economics, 7(1), 20–37.

McDonnell, J., and R. Williams (1994): "Measuring Saving Intentions," Australian Economic Review, 3rd Quarter, 64–74.

Pashardes, P. (1991): "Contemporaneous and Intertemporal Child Costs: Equivalent Expenditure vs Equivalent Income Scales," Journal of Public Economics, 45(2), 191–213.

Poterba, J. M., and A. A. Samwick (1997): "Household Portfolio Allocation over the Life Cycle," Working Paper 6185, N.B.E.R., Cambridge.

Tobin, J. (1951): Relative Income, Absolute Income and Savingpp. 135–56. Macmillan, New York.

Wang, Y. (1994): "Effects of the Price of Time on Household Saving: A Life-Cycle Consistent Model and Evidence from Micro-Data," Southern Economic Journal, 60(4), 832–844.