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Coverage, knowledge and perceptions of superannuation in Australia

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Abstract

Binary logit models are used to predict coverage, knowledge and perceptions of superannuation on the basis of individual demographic, socioeconomic and financial characteristics. The data is drawn from the 2003 ANZ Survey of Adult Financial Literacy in Australia and relates to 3,548 respondents. Knowledge of superannuation is defined, amongst other things, in terms of understanding superannuation fees and charges and statements, recognising the voluntary and compulsory nature of additional employee and employer contributions and the recognising the lower taxation of superannuation compared to other investments. Factors examined include gender, age, ethnicity, occupation, educational level and family structure, along with household income, savings, and mortgage and non-mortgage debt. The evidence suggests that knowledge of superannuation is unevenly spread across respondents, even those with superannuation funds. Such knowledge is generally lowest for females, those from a non-English speaking background, those with low levels of secondary education and persons aged less than thirty. Knowledge is generally better for professionals, those aged over forty or retired and the university educated. The models best predict the overall coverage of superannuation and for those with superannuation, the compulsory nature of employer contributions and the ability to read and understand superannuation statements.

JEL classification C25, D14, G28

Keywords Superannuation and retirement planning; binary logit; demographic, socioeconomic and financial characteristics.

Introduction

It is now nearly twenty years since Australia started down the path towards a compulsory privately-funded retirement income (superannuation) system supplemented by an intentionally narrowly-focused (age, means and income tested) public pension. Starting in the 1980s, superannuation was gradually extended throughout the workforce until its extension to all employees through compulsory employer contributions was enshrined in the 1992 Superannuation Guarantee Charge. With this steadily increasing contribution rate now stabilised at nine percent, the superannuation system has further evolved with the self-employed encouraged to save through tax concessions, the possibility of self-managed superannuation funds for those with significant assets, the opportunity for some employed to package tax-effective funding through salary sacrifice, and the option for all employees to contribute additional voluntary contributions. Even now, superannuation has continued to

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evolve. Most recently, from July 2005 millions more employees are now able to choose their superannuation fund, and this is likely to be further extended from July 2006 [Stanford (2004) highlights additional developments in Australian superannuation].

Clearly, these developments have led to consumers being faced with a bewildering array of choices regarding superannuation. While these will surely lead to greater benefits for the majority, it is also clear that the responsibility for superannuation increasingly lies with consumers. Importantly, while several Australian government agencies combine to regulate and enforce legal standards to protect consumer benefits [the Australian Securities and Investments Commission controls the dissemination of information and conduct under company law; the Australian Prudential Regulation Authority regulates how funds operate; the Australian Taxation Office supervises self-managed funds, employer contributions, co-contributions and superannuation tax rules], neither government nor government agencies guarantee superannuation capital or earnings. Such conditions invariably place an emphasis on the ability of superannuates to make sound, well-informed, decisions. The Australian Securities and Investment's Commission (2005) Super Choices – Think about Your Future is just the latest in a long line of well-publicised documents and media releases exhorting Australians to think about their own superannuation strategies.

Consider the choice of superannuation fund. In choosing a fund, potential members need to evaluate the nature of each fund's investment strategy, investment portfolio and investment risk and returns to determine the best match for their own subjective preferences. Additional complexities arise in the fees and charges (entry, exit, management fees) and the interrelationships with allied products like income protection and death and disability cover (Brown et al. 2002). It is argued that many superannuation fund members simply do not have the financial knowledge or skills to deal with such tasks. For example, the 1997 Australian Law Reform Commission's *Seen and Heard* report found that young people were ill informed about a wide range of consumer services, while the 2003 ANZ Bank's *Survey of Adult Financial Literacy in Australia* showed that while most Australians have basic financial literacy, young consumers and those from low socioeconomic backgrounds were at a disadvantage in making informed decisions about money management. Worthington (2004; 2005) has examined some of these problems with financial literacy and the lack of planning in regards to emergency funds and the growth in household debt.

Similarly, submissions to the senate select committee on superannuation choice concluded that 46 percent of Australians have "unsatisfactorily low levels of literacy" and 15 percent are

"functionally illiterate" and AMP Financial Services suggested that the implication of this is "that there is going to be a percentage of the population who will never understand the concepts involved". Lastly, the 2004 Consumer and Financial Literacy Taskforce's *Australian Consumers and Money* stock take of initiatives by public, private and community sector bodies found that while there was no shortage of consumer information, a good proportion of that material was either not known, not properly targeted or not used by Australian consumers.

Problematically, the profile of consumers requiring knowledge to deal with complex superannuation decisions has changed with its spread across the workforce. Changes in demography with ageing and ethnically-diverse populations has seen language, educational and cultural barriers arise that may hinder the access of some populations to these improved opportunities, and lead others less knowledgeable to questionable decision-making. Brown et al. (2002), for example, concluded that when faced with the complex investment decisions inherent in a superannuation choice system, individual attitudes towards participation are likely to vary considerably. Since those who choose to avoid participation will remain effectively disengaged from the process, it is erroneous to assume that all superannuation fund members are able and/or willing to develop their skills to a level sufficient to exercise informed choice. Beal and Delpachitra (2003) also draw attention to concerns with the general lack of retirement knowledge and planning by many Australians. At the same time, labour trends towards a part-time workforce are associated with the fragmentation of knowledge and superannuation accounts, and it is well known that women suffer a disadvantage in superannuation markets, and this may be partially related to a lack of knowledge associated with historical disengagement (Preston and Austin 2001; Olsberg 2002).

The purpose of this paper is to assay the current state of knowledge concerning superannuation in Australia and examine some of the perceptions surrounding retirement planning in Australia. This should allow an assessment to be made of the success of programs by the government and others to improve knowledge of superannuation generally, and highlight any potential problems with the knowledge base of superannuation participants that may prevent or hinder their successful participation in these new opportunities, or much worse, adversely affect the viability of their own and the government's superannuation outcomes. The paper itself is divided into four main areas. The first section explains the empirical methodology and data employed in the analysis. The second section discusses

variable specification, and the third section presents the results. The paper ends with some concluding remarks.

Research method and data

A convenient consumer behaviour model put forward by the Consumer and Financial Literacy Taskforce (2004) hypothesises that external events, socioeconomic background, personal characteristics, skill levels and choices of information all shape the way knowledge, perceptions and decisions in financial services markets are made. First, economic, regulatory, cultural and political factors shape the external environment facing consumers. These comprise market forces regarding the price and non-price characteristics of products available, and non-market impacts such as government regulation concerning the information made available to consumers, including product disclosure, consumer protection and opportunities for redress. Second, the consumer's own socioeconomic and personal characteristics also affect their knowledge, perceptions and the decision-making process. These include education, age, gender, health status and cultural background along with needs and aspirations.

Third, there are the events that have happened in each consumer's life. In the context of financial services markets, these include past experiences (both good and bad) with particular products and services. Finally, there are things consumers can learn to assist consumption. These may include prerequisite skills (such as literacy and numeracy), planning skills (comprising budgeting, saving and spending), and risk management skills (including insurance and portfolio management). They may also include knowledge as to where information and advice may be obtained. Sources of information and advice can be formal or informal and they can be direct or intermediated. Clearly, the coverage, knowledge and perceptions of superannuation may result from any or all of these sources, and so attempts to model their distribution should take into account the different demographic, socioeconomic and financial backgrounds of consumers.

The data used in this study is from the ANZ Survey of Adult Financial Literacy in Australia (2003): a national telephone survey of 3,548 respondents. The use of this unpublished data is thought to be entirely appropriate, not least that the economic model of consumer behaviour is only theoretically sound at the individual level, but because the primary focus of studies of this type is invariably on predictions for individual behaviour. The data is composed of three sets of information. The first set used in this study consists of each respondent's answers to a

set of questions aimed at measuring understanding of superannuation. The understanding of superannuation was assessed through a number of areas, including the compulsory nature of employer contributions, rights of employees to make additional contributions, taxation benefits and so on. The ability of respondents to understand fees and charges and check superannuation statements was also assessed.

The ten specific questions examined in this study are provided in the uppermost portion of Table 1. These variously relate to objectives of understanding that superannuation sets aside money for retirement and involves compulsory employer contributions (adequacy and planning, fees and charges and compulsory contributions), understanding that personal contributions may be optionally made (personal contributions), the ability to check compulsory employer contributions have been made (employer contributions), the ability to check and maintain superannuation records (statements), and understanding that superannuation can be a tax effective form of investment (taxation). Importantly, only the first question concerning participation in superannuation was administered to all those surveyed, while subsequent questions concerning superannuation were only administered to this subgroup (70.91 percent of all respondents). Responses to these questions ranged between the 97.40 percent of respondents who knew that employers were obliged to make compulsory contributions to employee superannuation down to the 37.01 percent of respondents who had worked out how they needed to save for retirement.

The analytical technique employed is to specify each respondent's responses concerning superannuation as the dependent variable in a regression with demographic, socioeconomic and financial characteristics as predictors. The nature of the dependent variable (binomial) indicates discrete dependent variable techniques are appropriate. Accordingly, binary logit models are specified.

Specification of explanatory variables

The next two sets of information are specified as explanatory variables in the binary logit regression models. The first of these relates to demographic and socioeconomic characteristics, and the second to financial characteristics. The first set of information is generally comparable to that employed in earlier studies of financial knowledge and perceptions. The second set of information is used to identify financial characteristics as a means of establishing a connection between financial knowledge and perceptions and respondent characteristics beyond these factors.

The set of demographic and socioeconomic variables upon which the questions concerning superannuation are regressed are first examined. The definition and coding of these dummy variables is detailed in Table 1. Whilst there is no unequivocal rationale for predicting the direction and statistical significance of many of these independent variables, their inclusion is consistent with both past studies of the determinants of financial knowledge and perceptions (as variously defined) and the presumed interests of educators, policy-makers and other parties. For example, Beal and Delpachitra (2003) included gender, household status, age, educational and employment status and time spent in the workforce, while Chen and Volpe (1998) added race and nationality, academic discipline and class rank.

<TABLE 1 HERE>

The first nine variables relate to the sex, geographical location, ethnic background and age of the respondent. These are used as proxies for characteristics exposing respondents to financial knowledge and perceptions including stage of life cycle, access to labour and credit markets, exposure to marketing and information campaigns, language skills and the level of financial responsibility. Chen and Volpe (1998: 114), for example, found that "…the percentages of correct answers from the female participants (50.77%) are lower than those from male participants (57.40%)" as did Goldsmith and Goldsmith (1997). Similarly, Chen and Volpe (1998) concluded that the less (financially) knowledgeable group was also more likely to be younger and female, while the Jumpstart Coalition for Personal Financial Literacy (2002) established that Native, African, Hispanic and Asian-Americans scored lower than other (White) students. Negative coefficients are hypothesised for gender, region and language with age coefficients being negative for younger and older respondents and positive for middle-aged respondents.

The next four variables indicate whether the respondent is non-working and looking for work (unemployed), non-working and a student, non-working and engaged in home duties, non-working and retired, and non-working for any other reason. Beal and Delpachitra (2003) also included variables indicating employed and unemployed respondents. Possible reasons for differences in financial knowledge and perceptions for non-working respondents include lack of exposure to financial transactions such as pay slips and superannuation statements, simpler sources of income, less exposure to work-related literacy campaigns, and fewer synergies between work-related and personal knowledge and perceptions. It is reasoned that all categories of non-working respondents will have lower levels of financial knowledge and perceptions: negative coefficients are hypothesised. Following this eleven categories of

occupation are specified. It is generally argued that white collar occupations are associated with higher levels of financial knowledge and more positive perceptions about superannuation, with some occupations having more reliance on skills included within financial knowledge, say, mathematical skills. Positive coefficients are hypothesised for white collar occupations, especially those involving business management or ownership; negative coefficients for blue collar occupations, primarily those in semi-skilled and unskilled trades.

The next four variables categorise respondents according to the highest level of education attained: namely, 4th Form/Year 10 or lower (corresponding in most Australian states to eleven years of primary and secondary education and the first secondary education qualification), HSC/VCE/6th Form/Year 12 (an additional two years of secondary education necessary university matriculation), technical/commercial/TAFE certificate or diploma (vocational specific education following either of the above), and university/CAE degree (three-year programs equivalent to university, polytechnic or liberal arts college elsewhere). All other things being equal, mathematical and language literacy skills attained in secondary and tertiary education should be useful for the purposes of financial knowledge and positive perceptions about superannuation, with higher levels of educational attainment associated with higher financial knowledge and more positive perceptions. Positive coefficients are hypothesised.

The following two variables indicate whether the household structure is a single parent or a couple with children at home and follows suggestions that single parent household are at most risk through a lack of financial knowledge skills. Finally, the next three variables indicate whether the principal residence is owned outright, being bought or rented. It is generally the case that a residential mortgage is the largest financial transaction entered into by most Australian household so that experience with dealing with such products may serve to improve knowledge of superannuation, especially in the context of budgeting, saving and spending and consumer rights and responsibilities. A positive coefficient is hypothesised for respondents who own outright or are burying their own home.

The final four variables in Table 1 are quantitative variables for household income, investments and debt. Knowledge and positive perceptions about superannuation is argued to increase with exposure to financial services markets and the opportunity cost of a lack of such knowledge should increase as income, debt and investment increase, thereby providing an incentive for improving skills. By comparison, Chen and Volpe (1998) and Beal and Delpachitra (2003) specified personal income alone. The financial variables are household

income, household savings (including superannuation but excluding home value), household mortgage debt and household non-mortgage debt in thousands of Australian dollars. A positive coefficient is hypothesised when superannuation knowledge and perceptions about superannuation is regressed against all four variables.

Empirical findings

The estimated coefficients and standard errors of the parameters for the logit regressions are provided in Tables 2 to 5. Also included in Tables 2 to 5 is the Nagelkerke R^2 as an analogue for that used in the linear regression model, the chi-squared statistic as a test of the null hypothesis that all slope coefficients are zero, and the Hosmer-Lemeshow test for model misspecification. Table 2 presents the estimated coefficients, standard errors and p-values for the model predicting participation in superannuation. Table 3 presents the estimated coefficients and significance for the models predicting knowledge of fees and charges, reading and understanding statements and knowledge of taxation. Table 4 tables the estimated coefficients and significance for the models predicting knowledge of compulsory employer contributions, voluntary employee contributions and the employer's compulsory rate of contribution. Finally, Table 5 includes these same estimated parameters for models predicting the voluntary nature of self-employed pays, perceptions regarding the role of government in any gap in superannuation funding and the forecasting of retirement needs.

<TABLE 2 HERE>

Start with Table 2 which predicts the coverage of superannuation in Australia. A model employing the entire set of explanatory variables was initially estimated (columns 2, 3 and 4), followed by a refined specification (columns 5, 6 and 7) obtained with forward stepwise regression using the Wald criteria. The refined model is preferred in terms of the trade-off between comprehensiveness and complexity (given the lower value of the Hannan-Quinn criteria) so only the refined model is discussed in detail. This allows a focus on the most significant factors affecting superannuation participation. Regardless, both the full and refined models appear appropriate to the data examined and the values of the Nagelkerke R^2 are adequate. To test for multicollinearity, variance inflation factors (VIF) are calculated. As a rule of thumb, a VIF greater than ten indicates the presence of harmful collinearity. Amongst the independent variables, the highest VIFs are for age 30-39 (5.24), other white collar occupation (5.69), skilled trades occupation (4.98). This suggests that multicollinearity, while present, is not too much of a problem. The chi-squared statistic rejects the null hypotheses

that all slope coefficients are zero and the Hosmer-Lemeshow tests fail to reject the null hypotheses of no functional misspecification (that is, there is not a significant difference between the observed and predicted cell counts) so we may conclude that both models are appropriate for predicting superannuation participation in Australia.

In the refined model, the estimated coefficients for twenty-five variables are significant at the 5 percent level of significance or lower and conform to *a priori* expectations. The estimated coefficients indicate that female, non-metropolitan, non-English speaking, unemployed, student, retired or home duties and non-working respondents, persons whose highest level of educational attainment is Year 10, single parents and renting households have a greater likelihood of not participating in superannuation. Being female increases the log odds of not having superannuation by 0.52, while speaking a language other than English at home or being unemployed increases the log odds of not having superannuation by 0.77 and 1.17, respectively. Put differently, the odds (e^x) of not having superannuation if female are 1.68 times the estimated odds for males, 2.16 times the estimated odds for English-speaking respondents if non-English speaking, and 3.22 times the estimated odds for the unemployed if unemployed.

On the other hand, being aged 18-24, 30-39, 40-49, 50-59 and 60-69 increases the likelihood of having superannuation (log odds of 2.95 and odds of 19.10 times for the 25-29 years age group over other age groups), as does being a professional, in sales, semi-professional, other white collar or skilled trades (log odds of 0.83 and odds of 2.29 times for other white collar over other occupations). Having a university education increases the log odds of 0.46 and odds of 1.58 times for university graduates over other levels of educational attainment. The estimated coefficients on income and savings are also positive and significant indicating superannuation participation increases non-linearly, but monotonically, with dollar value. Moreover, they also indicate that an increase in the dollar value of savings increases the log odds of superannuation participation more than income.

<TABLE 3 HERE>

Table 3 includes the logit models predicting whether respondents know well, fairly well or very well about the fees and charges on superannuation (columns 2, 3 and 4) , whether they read and understand well, fairly well or very well superannuation statements (columns 5, 6 and 7), and whether they knew superannuation was taxed at a lower rate than other investments (columns 8, 9 and 10). As before, models including the full set of explanatory

variables were initially estimated, followed by forward stepwise regression models using the Wald criteria. In all instances, the refined models were to be preferred and accordingly only these are presented. In the case of an adequate knowledge of the fees and charges on superannuation, eleven variables were stepped into the model. These indicate that females, persons aged 18-24 and 25-29, persons with a Year 10 education or lower and single parents are less likely to have a sound knowledge of the fees and charges on superannuation, and that persons aged 40-49, 50-59 and 60-69, the retired, those who own their home outright and those with a higher dollar value of savings are more likely to have this same knowledge. The highest positive likelihood for having such knowledge is for persons aged 60-69 (0.86 log odds and 2.36 times the odds of other age groups) and the greatest negative likelihood is for persons aged 25-29 (0.47 log odds and 1.59 times less the odds of other age groups).

<TABLE 4 HERE>

Remarkably, and given that the questions on superannuation are apparently closely related, there are many differences between the factors significant in responding to this question and those on read and understanding superannuation statements and knowing that superannuation is taxed at a lower rate than other investments. In the former, significant positive factors include being retired, professional and couples with negative factors being female, aged 18-24, 25-29 and 30-39, Year 10 education or lower, and single parents. Of these, the most influential factor indicating a lack of the ability to read and understand superannuation statements is being aged 18-24 (-0.94 log odds and 2.56 odds less likely) with the most influential positive factor being retired (-0.86 log odds and 2.23 odds more likely). In the latter, positive factors associated with knowledge of the (lower) relative taxation of superannuation include being aged 40-49, 50-59 and 60-69, being professional, a farm owner or other white collar, university educated and having higher income, savings and mortgage debt. In fact, professionals and farm owners have respective odds of 1.78 and 4.62 times those of other occupations of knowing the lower tax status of superannuation. Negative factors include being female and with a Year 10 or Year 12 education as the highest level of attainment.

<TABLE 5 HERE>

Table 4 presents the refined models for those questions regarding knowledge of the compulsory nature of employer contributions, the voluntary nature of additional employee contributions and the actual compulsory rate of contribution by employers. As indicated in the

descriptive statistics, a large proportion of respondents could answer the first two questions correctly of which the two main negative factors in both instances are being from a non-English speaking background and being aged 18-24 years. In terms of approximately knowing the compulsory rate of employer contributions, this was most well known by professionals, small business owners and other white collar occupation and less known by females. Table 5 includes the models where knowledge that the self-employed are not obliged to make superannuation payments, perceptions that the government would fund any gap in superannuation and that the respondent had evaluated their retirement needs were measured. Putting aside the first model where the null hypothesis of no functional misspecification was rejected, the unemployed and unskilled trades were most likely to believe that the government would make up any gap in a lack of retirement planning. In terms of making retirement plans, rural households, those aged 40-49, 50-59 and 60-69, professionals, skilled trades, house owners and buyers, and those with higher incomes and savings responded positively, while females, those from a non-English speaking background, non-workers and single parents responded negatively.

<TABLE 6 HERE>

As a final requirement, the ability of the models to accurately predict responses is examined. Table 6 provides the results for the refined models in each of Table 2, 3, 4 and 5 with the predicted number in each response category. To start with, consider the predictions for the model of superannuation participation. Of the 2,516 respondents who indicated that they had superannuation, the estimated model correctly predicts 2,264 as having superannuation and incorrectly predicts 252 as not having superannuation. With the 1,032 respondents who did not have superannuation, the model correctly predicts 635 and incorrectly predicts 397. These represent the correct prediction of 90.0 percent of cases with superannuation and the correct prediction of 61.5 percent of cases without superannuation: a total prediction success of 81.7 percent of respondents.

By comparison, the refined models correctly predicted 63.1 percent of responses to the question concerning fees and charges, 68.6 percent for ability to read and understand superannuation statements, 64.1 percent for knowledge of the lower taxation of superannuation, 97.4 and 91.3 percent for knowledge of the compulsory nature of employer contributions and the ability for employees to make additional payments, 62.1 percent for the approximate knowledge of the compulsory employer contribution, 58.7 percent of respondents knowing the voluntary nature of self-employed contributions, 96.2 percent of

respondents who believed the government would not fund any gap in retirement funding and 67.7 percent of responses concerning retirement planning. Of course, these are 'in-sample' predictions and the results could differ if 'out-of-sample' data was made available.

Concluding remarks and policy recommendations

The present study uses binary logit models to investigate the role of demographic, socioeconomic and financial characteristics in determining coverage, knowledge and perceptions of superannuation in Australian adults. To start with, it has been shown that the distribution of superannuation in Australia varies strongly according to demographic and socioeconomic characteristics. All other things being equal, female, non-metropolitan, non-English speaking, unemployed, student, retired or home duties and non-working respondents, persons whose highest level of educational attainment is Year 10, single parents and renting households have a greater likelihood of not participating in superannuation, while being aged 18-24, 30-39, 40-49, 50-59 and 60-69, a professional, in sales, semi-professional, other white collar or skilled trades and university educated increases the likelihood of having a superannuation fund. Obviously, the system of occupational superannuation will always mostly concern those with strong attachments to the labour market, but this analysis clearly highlights particular demographic and socioeconomic groups that currently have very low levels of experience with superannuation and would, if their labour status changes, be at some disadvantage in superannuation knowledge and skills.

In terms of specific superannuation knowledge, most respondents (those with superannuation funds) know that employers are obliged to make contributions on behalf of employees and that employees can make additional voluntary payments above these contributions. Most of these fund holders are also well aware that the government will not make up the gap in funding from a lack of retirement planning. About two-thirds of fund members knew how to read and understand their statements, and slightly more than half knew that superannuation is taxed at lower rates than other investments and the approximate percentage of income employers were obliged to contribute. Less than half of superannuation fund members have worked out how much they needed to save for retirement and understood the fees and charges associated with their superannuation.

However, these overall levels of knowledge obscure significant deficiencies in particular demographic and socioeconomic groups. Females, those from a non-English speaking background, those aged under thirty years, the currently unemployed and those with a Year 10

education or lower are particularly overrepresented in being unable to correctly respond to basic questions concerning superannuation. Importantly, these questions were only administered to those respondents with superannuation and so it is not merely a matter of a lack of experience with the labour force. But the reasons for this lack of knowledge are likely to differ. For women it may relate to career interruptions and a lack of historical engagement with superannuation. For those from a non-English speaking background, it most likely flows from a lack of English language skills and financial literacy. And for the young, it can indicate a lack of interest in (far off) retirement. Pleasingly, at least some of these deficiencies appear to be solved as retirement approaches with levels of superannuation knowledge growing strongly from forty years onwards. But with superannuation choices ever-widening, it is likely that ever younger fund members will need to make decisions today that will affect outcomes far in the future. Attaining critical knowledge on the threshold of retirement is then unlikely to be any consolation for the lack of informed decision-making when it counted most.

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TABLE 1. Variable definitions and statistics

Variable	Definition	Mean	Std. dev.
Superannuation	1 if have superannuation; 0 otherwise	70.91	–
Fees and charges	1 if understand fees and charges on superannuation well, fairly well or very well; 0 otherwise	44.16	–
Statements	1 if read and understand superannuation statements well, fairly well or very well; 0 otherwise	67.05	–
Taxation	1 if know that superannuation is taxed at a lower rate than other investments; 0 otherwise	53.50	–
Employer contribution	1 if know that employers are obliged to make contributions on behalf of employees; 0 otherwise	97.40	–
Employee contribution	1 if know that employees can make superannuation payments additional to any payments made by their employer; 0 otherwise	91.34	–
Rate of contribution	1 if know percentage of an employee's salary an employer is required by law to make on behalf of an employee within two percentage points; 0 otherwise	57.43	–
Self-employed payments	1 if know that self-employed persons are not required by law to make superannuation payments; 0 otherwise	43.36	–
Superannuation gap	1 if respond that government will not make up gap from not planning for retirement ; 0 otherwise	93.84	–
Retirement needs	1 if respond that have worked out how much will need to save for retirement; 0 otherwise	37.01	–
Gender	1 if female; 0 male	50.56	50.00
Region	1 if rural, regional or non-capital city household; 0 metropolitan	37.80	48.49
Language	1 if language spoken most often at home is non-English; 0 English	10.01	30.01
Age 18-24	1 if aged 18-24 years; 0 otherwise	12.80	33.41
Age 25-29	1 if aged 25-29 years; 0 otherwise	9.13	28.81
Age 30-39	1 if aged 30-39 years; 0 otherwise	20.24	40.18
Age 40-49	1 if aged 40-49 years; 0 otherwise	19.59	39.69
Age 50-59	1 if aged 50-59 years; 0 otherwise	15.39	36.09
Age 60-69	1 if aged 60-69 years; 0 otherwise	11.92	32.41
Unemployed	1 if non-working and looking for work (unemployed); 0 otherwise	4.26	20.19
Student	1 if non-working and principally engaged as student; 0 otherwise	3.38	18.08
Home duties	1 if non-working and principally engaged in home duties; 0 otherwise	7.22	25.88
Retired	1 if non-working and principally retired; 0 otherwise	21.03	40.76
Non-worker	1 if non-working and not student, home duties or retired; 0 otherwise	2.37	15.21
Professional	1 if principal occupation is professional; 0 otherwise	11.02	31.32
Owners or executives	1 if principal occupation is business owner or executive; 0 otherwise	1.63	12.68
Small business owner	1 if principal occupation is small business owner; 0 otherwise	4.59	20.94
Sales	1 if principal occupation is sales; 0 otherwise	6.54	24.72
Semi-professional	1 if principal occupation is semi-professional; 0 otherwise	11.95	32.44
Other white collar	1 if principal occupation is other white collar; 0 otherwise	22.13	41.51
Skilled trades	1 if principal occupation is skilled tradesman; 0 otherwise	17.19	37.74
Semi-skilled trades	1 if principal occupation is semi-skilled tradesman; 0 otherwise	11.22	31.56
Unskilled trades	1 if principal occupation is unskilled tradesman; 0 otherwise	7.69	26.65
Farm owner	1 if principal occupation is farm owner; 0 otherwise	1.10	10.43
Farm worker	1 if principal occupation is farm worker; 0 otherwise	0.87	9.31
Year 10	1 if highest level of education is 4th Form/Year 10 or lower; 0 otherwise	28.27	45.04
Year 12	1 if highest level of education is HSC/VCE/6th Form/Year 12; 0 otherwise	15.76	36.44
Technical	1 if highest level of education completed is technical/commercial/TAFE; 0 otherwise	9.67	29.56
University	1 if highest level of education completed university/CAE; 0 otherwise	25.48	43.58
Single parents	1 if household structure is single parent with children at home; 0 otherwise	6.85	25.26
Couples	1 if household structure is couple with children at home; 0 otherwise	36.27	48.09
Owned outright	1 if residency is owned outright; 0 otherwise	42.56	49.45
Paying off	1 if residency is being paid off; 0 otherwise	33.20	47.10
Rented	1 if residency is being rented; 0 otherwise	22.80	41.96
Income	Total household income ($000s)	61.84	23.23
Savings	Total household savings incl. superannuation but excluding home value ($000s)	40.88	24.30
Mortgage debt	Total household mortgage debt ($000s)	52.75	116.26
Non-mortgage debt	Total household non-mortgage debt ($000s)	15.38	54.77

TABLE 2 Parameter estimates and statistics: Superannuation participation

Variable/statistic	Full model			Refined model		
	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value
Gender	-0.511	0.106	0.000	-0.523	0.105	0.000
Region	-0.226	0.100	0.024	-0.226	0.099	0.023
Language	-0.784	0.156	0.000	-0.776	0.155	0.000
Age 18-24	2.105	0.257	0.000	2.082	0.248	0.000
Age 25-29	2.937	0.291	0.000	2.953	0.282	0.000
Age 30-39	2.810	0.257	0.000	2.828	0.242	0.000
Age 40-49	2.406	0.243	0.000	2.429	0.231	0.000
Age 50-59	2.184	0.216	0.000	2.211	0.213	0.000
Age 60-69	1.193	0.174	0.000	1.204	0.173	0.000
Unemployed	-1.176	0.202	0.000	-1.167	0.200	0.000
Student	-1.808	0.234	0.000	-1.835	0.224	0.000
Home duties	-1.876	0.172	0.000	-1.858	0.168	0.000
Retired	-1.393	0.179	0.000	-1.363	0.175	0.000
Non-worker	-2.199	0.265	0.000	-2.200	0.262	0.000
Professional	0.733	0.291	0.012	0.621	0.203	0.002
Owners or executives	0.297	0.465	0.523	–	–	–
Small business owner	-0.077	0.310	0.803	–	–	–
Sales	0.529	0.281	0.060	0.395	0.196	0.044
Semi-professional	0.876	0.271	0.001	0.753	0.178	0.000
Other white collar	0.958	0.244	0.000	0.827	0.133	0.000
Skilled trades	0.690	0.251	0.006	0.558	0.142	0.000
Semi-skilled trades	0.267	0.254	0.293	–	–	–
Unskilled trades	0.061	0.263	0.816	–	–	–
Farm owner	-0.234	0.486	0.630	–	–	–
Farm worker	0.775	0.497	0.119	–	–	–
Year 10	-0.290	0.136	0.033	-0.269	0.113	0.017
Year 12	-0.072	0.156	0.647	–	–	–
Technical	-0.036	0.185	0.845	–	–	–
University	0.428	0.163	0.009	0.456	0.146	0.002
Single parents	-0.523	0.184	0.004	-0.569	0.175	0.001
Couples	0.053	0.126	0.673	–	–	–
Owned outright	0.084	0.392	0.831	–	–	–
Paying off	-0.212	0.401	0.598	–	–	–
Rented	-0.597	0.396	0.132	-0.610	0.121	0.000
Income	0.006	0.002	0.012	0.006	0.002	0.005
Savings	0.012	0.002	0.000	0.012	0.002	0.000
Mortgage debt	0.002	0.001	0.021	–	–	–
Non-mortgage debt	-0.001	0.001	0.428	–	–	–
Constant	-1.028	0.528	0.051	-0.932	0.288	0.001
Chi-squared statistic	1433.600	–	0.000	1420.336	–	0.000
Hosmer-Lemeshow	5.345	–	0.720	7.892	–	0.444
Nagelkerke R^2	0.474	–	–	0.470	–	–

The null hypothesis for the chi-squared test statistic is no difference between an intercept only and the estimated model; the null hypothesis for the Hosmer-Lemeshow test statistic is no functional misspecification; the Nagelkerke R^2 is analogous to that in the linear regression model.

TABLE 3 Parameter estimates and statistics: Fees and charges, statements and taxation

	Fees and charges			Statements			Taxation		
	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value
Gender	-0.359	0.085	0.000	-0.550	0.134	0.000	-0.648	0.086	0.000
Region	–	–	–	–	–	–	–	–	–
Language	–	–	–	–	–	–	–	–	–
Age 18-24	-0.325	0.151	0.031	-0.937	0.205	0.000	–	–	–
Age 25-29	-0.469	0.158	0.003	-0.776	0.219	0.000	–	–	–
Age 30-39	–	–	–	-0.716	0.168	0.000	–	–	–
Age 40-49	0.340	0.118	0.004	–	–	–	0.275	0.108	0.011
Age 50-59	0.590	0.132	0.000	–	–	–	0.389	0.124	0.002
Age 60-69	0.859	0.191	0.000	–	–	–	0.700	0.171	0.000
Unemployed	–	–	–	–	–	–	–	–	–
Student	–	–	–	–	–	–	–	–	–
Home duties	–	–	–	–	–	–	–	–	–
Retired	0.385	0.167	0.022	0.857	0.317	0.007	–	–	–
Non-worker	–	–	–				–	–	–
Professional	–	–	–	0.528	0.237	0.026	0.575	0.149	0.000
Owners or executives	–	–	–	–	–	–	–	–	–
Small business owner	–	–	–	–	–	–	–	–	–
Sales	–	–	–	–	–	–	–	–	–
Semi-professional	–	–	–	–	–	–	–	–	–
Other white collar	–	–	–	–	–	–	0.336	0.102	0.001
Skilled trades	–	–	–	–	–	–	–	–	–
Semi-skilled trades	–	–	–	–	–	–	–	–	–
Unskilled trades	–	–	–	–	–	–	–	–	–
Farm owner	–	–	–	–	–	–	1.153	0.588	0.050
Farm worker	–	–	–	–	–	–	–	–	–
Year 10	-0.372	0.105	0.000	-0.450	0.166	0.007	-0.530	0.119	0.000
Year 12	–	–	–	–	–	–	-0.361	0.127	0.005
Technical	–	–	–	–	–	–	–	–	–
University	–	–	–	–	–	–	0.376	0.115	0.001
Single parents	-0.449	0.187	0.017	-0.685	0.255	0.007	–	–	–
Couples	–	–	–	0.297	0.145	0.040	–	–	–
Owned outright	0.232	0.098	0.018	–	–	–	–	–	–
Paying off	–	–	–	–	–	–	–	–	–
Rented	–	–	–	–	–	–	–	–	–
Income	–	–	–	–	–	–	0.007	0.002	0.001
Savings	0.008	0.002	0.000	–	–	–	0.009	0.002	0.000
Mortgage debt	–	–	–	–	–	–	0.001	0.000	0.011
N on-mortgage debt	–	–	–	–	–	–	–	–	–
Constant	-0.609	0.124	0.000	1.300	0.156	0.000	-0.743	0.173	0.000
Hosmer-Lemeshow	6.878	–	0.550	3.903	–	.866	6.343	–	-.609
Nagelkerke R^2	0.116	–	–	0.117	–	–	0.146	–	–

The null hypothesis for the Hosmer-Lemeshow test statistic is no functional misspecification; the Nagelkerke R^2 is analogous to that in the linear regression model.

TABLE 4 Parameter estimates and statistics: Employer and employee contributions and rate of contribution

	Employer contribution			Employee contribution			Rate of contribution		
	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value
Gender	–	–	–	–	–	–	-0.445	0.108	0.000
Region	–	–	–	–	–	–	–	–	–
Language	-1.374	0.355	0.000	-1.323	0.239	0.000	–	–	–
Age 18-24	-0.892	0.344	0.010	-1.005	0.209	0.000	–	–	–
Age 25-29	–	–	–	–	–	–	–	–	–
Age 30-39	–	–	–	–	–	–	–	–	–
Age 40-49	–	–	–	–	–	–	–	–	–
Age 50-59	–	–	–	–	–	–	–	–	–
Age 60-69	–	–	–	–	–	–	–	–	–
Unemployed	–	–	–	–	–	–	–	–	–
Student	–	–	–	–	–	–	–	–	–
Home duties	–	–	–	–	–	–	–	–	–
Retired	–	–	–	–	–	–	–	–	–
Non-worker	–	–	–	–	–	–	–	–	–
Professional	–	–	–	–	–	–	0.692	0.174	0.000
Owners or executives	–	–	–	–	–	–	–	–	–
Small business owner	–	–	–	–	–	–	0.388	0.084	0.000
Sales	–	–	–	–	–	–	–	–	–
Semi-professional	–	–	–	–	–	–	–	–	–
Other white collar	–	–	–	–	–	–	0.488	0.125	0.000
Skilled trades	–	–	–	–	–	–	–	–	–
Semi-skilled trades	–	–	–	–	–	–	–	–	–
Unskilled trades	–	–	–	–	–	–	–	–	–
Farm owner	–	–	–	–	–	–	–	–	–
Farm worker	–	–	–	–	–	–	–	–	–
Year 10	–	–	–	-0.750	0.217	0.001	–	–	–
Year 12	–	–	–	–	–	–	–	–	–
Technical	–	–	–	–	–	–	–	–	–
University	–	–	–	–	–	–	–	–	–
Single parents	–	–	–	–	–	–	–	–	–
Couples	–	–	–	–	–	–	–	–	–
Owned outright	–	–	–	–	–	–	0.505	0.122	0.000
Paying off	–	–	–	–	–	–	–	–	–
Rented	–	–	–	-0.431	0.200	0.031	–	–	–
Income	–	–	–	–	–	–	0.008	0.003	0.002
Savings	–	–	–	–	–	–	0.006	0.003	0.013
Mortgage debt	–	–	–	0.004	0.001	0.007	0.002	0.001	0.000
Non-mortgage debt	–	–	–	–	–	–	–	–	–
Constant	4.059	0.210	0.000	2.889	0.174	0.000	-0.844	0.215	0.000
Hosmer-Lemeshow	0.122	–	0.727	1.881	–	0.984	6.268	–	0.617
Nagelkerke R^2	0.054	–	–	0.116	–	–	0.102	–	–

The null hypothesis for the Hosmer-Lemeshow test statistic is no functional misspecification; the Nagelkerke R^2 is analogous to that in the linear regression model.

TABLE 5 Parameter estimates and statistics: Self-employed payments, funding gap and retirement needs

	Self-employed payments			Superannuation gap			Retirement needs		
	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value	Estimated coefficient	Standard error	p-value
Gender	–	–	–	–	–	–	-0.194	0.098	0.047
Region	–	–	–	–	–	–	0.253	0.099	0.011
Language	–	–	–	–	–	–	-0.474	0.170	0.005
Age 18-24	–	–	–	–	–	–	–	–	–
Age 25-29	–	–	–	–	–	–	–	–	–
Age 30-39	–	–	–	–	–	–	–	–	–
Age 40-49	–	–	–	–	–	–	0.592	0.118	0.000
Age 50-59	–	–	–	–	–	–	0.846	0.139	0.000
Age 60-69	–	–	–	–	–	–	1.180	0.300	0.000
Unemployed	–	–	–	-1.136	0.352	0.001	–	–	–
Student	–	–	–	–	–	–	–	–	–
Home duties	–	–	–	–	–	–	–	–	–
Retired	–	–	–	–	–	–	–	–	–
Non-worker	–	–	–	–	–	–	-0.929	0.466	0.046
Professional	–	–	–	–	–	–	0.432	0.142	0.002
Owners or executives	–	–	–	–	–	–	–	–	–
Small business owner	–	–	–	–	–	–	–	–	–
Sales	–	–	–	–	–	–	–	–	–
Semi-professional	–	–	–	–	–	–	–	–	–
Other white collar	–	–	–	–	–	–	–	–	–
Skilled trades	–	–	–	–	–	–	0.257	0.126	0.041
Semi-skilled trades	–	–	–	–	–	–	–	–	–
Unskilled trades	–	–	–	-0.917	0.335	0.006	–	–	–
Farm owner	–	–	–	–	–	–	–	–	–
Farm worker	–	–	–	–	–	–	–	–	–
Year 10	–	–	–	–	–	–	–	–	–
Year 12	–	–	–	–	–	–	–	–	–
Technical	–	–	–	–	–	–	–	–	–
University	–	–	–	–	–	–	–	–	–
Single parents	–	–	–	–	–	–	-0.564	0.208	0.007
Couples	0.761	0.245	0.002	–	–	–	–	–	–
Owned outright	–	–	–	–	–	–	0.483	0.141	0.001
Paying off	–	–	–	–	–	–	0.303	0.128	0.018
Rented	–	–	–	–	–	–	–	–	–
Income	–	–	–	0.010	0.005	0.047	0.009	0.002	0.000
Savings	–	–	–	–	–	–	0.015	0.002	0.000
Mortgage debt	–	–	–	–	–	–	–	–	–
Non-mortgage debt	–	–	–	–	–	–	–	–	–
Constant	-0.682	0.183	0.000	2.776	0.337	0.000	-2.320	0.218	0.000
Hosmer-Lemeshow	0.000	–	0.000	3.611	–	0.607	9.761	–	0.282
Nagelkerke R^2	0.046	–	–	0.037	–	–	0.177	–	–

The null hypothesis for the Hosmer-Lemeshow test statistic is no functional misspecification; the Nagelkerke R^2 is analogous to that in the linear regression model.

TABLE 6 Observed and predicted values

		Observed response		Predicted response		Correct
		0	1	0	1	%
Superannuation	0	1032	0	635	397	61.5
	1	0	2516	252	2264	90.0
	Total	1032	2516	887	2661	81.7
Fees and charges	0	1405	0	1068	337	76.0
	1	0	1111	592	519	46.7
	Total	1405	1111	1660	856	63.1
Statements	0	373	0	74	299	19.8
	1	0	759	56	703	92.6
	Total	373	759	130	1002	68.6
Taxation	0	1170	0	698	472	59.7
	1	0	1346	432	914	67.9
	Total	1170	1346	1130	1386	64.1
Employer contribution	0	42	0	0	42	0.0
	1	0	1574	0	1574	100.0
	Total	42	1575	0	1616	97.4
Employee contribution	0	140	0	0	140	0.0
	1	0	1476	1	1475	99.9
	Total	140	1476	1	1615	91.3
Rate of contribution	0	670	0	302	368	45.1
	1	0	904	229	675	74.7
	Total	670	904	531	1043	62.1
Self-employed payments	0	162	0	89	73	54.9
	1	0	124	45	79	63.7
	Total	162	124	134	152	58.7
Superannuation gap	0	81	0	0	84	0.0
	1	0	2133	0	2133	100.0
	Total	81	2133	0	2217	96.2
Retirement needs	0	1350	0	1099	251	81.4
	1	0	867	466	401	46.3
	Total	1350	867	1565	652	67.7

Observed is the actual response by category, predicted is the predicted response by category; percentage corrected is predicted response by category as a percentage of the observed category; the predictions correspond to the refined model in Table 2 and the models in Table 3, 4 and 5; total percentage correct is the number of correct predictions as a percentage of the total observed.