FINANCIAL LITERACY AMONG AUSTRALIAN UNIVERSITY STUDENTS

by

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1   Introduction

'Astute savers are distinguished by the diversity of the assets to which they allocate their funds, and the dynamic manner in which they manage their investments': so Connelly (2001, p. 7) characterises people with investment literacy. Financial literacy, however, is a broader concept for which the terminology has possibly only been in existence for a decade or so.

Financial literacy was defined in the UK by Noctor, Stoney and Stradling (1992) as 'the ability to make informed judgements and to take effective decisions regarding the use and management of money'. Schagen and Lines (1996, p. 91) operationalised this definition by proposing that a financially-literate person would enjoy a range of abilities and attitudes comprising:
- an understanding of the key concepts central to money management;
- a working knowledge of financial institutions, systems and services;
- a range of [analytical and synthetical] skills, both general and specific;
- attitudes which …allow effective and responsible management of financial affairs.

Notwithstanding the exact definition of, and the skills required for, financial literacy, commentators throughout the developed world during the last decade have warned of insufficient personal financial literacy. Having financial skills has become more important as financial markets have been deregulated and credit has become easier to obtain as financial institutions compete strongly with each other for market share. Additionally, the easy issue and ubiquitous acceptance of credit cards have facilitated spending on consumption. Moreover, the development and marketing of financial products has burgeoned, people have been encouraged to invest directly by means of the internet and discussion of financial strategies has become part of everyday conversation. Furthermore, governments world-wide are moving down the path of encouraging their citizens to take more responsibility for their retirement incomes and to move away from public pensions. Employers are equally trying to shed the responsibility and risk associated with defined-benefit retirement schemes by changing to defined-contribution accumulation schemes where beneficiaries are responsible for their own investment strategies and eventual retirement benefits.

Symptoms of insufficient personal financial literacy include rising individual debt levels with overuse of credit cards, using personal loans for consumption and undertaking over-optimistic home-loan obligations, irresponsible overspending on

consumption, foolish commitment to get-rich-quick schemes, making unwise high-risk investments inconsistent with required capital stability and entering inappropriate vehicle-leasing contracts, among others. On a more mundane level, people on lower incomes often make unwise commitments to mobile-telephone contracts, buy now-pay later purchases, long-term exercise-centre contracts and expensive diet plans.

In the UK early in the 1990s, many people including Mannion (1992) warned of dramatic increases in personal debt levels. The NatWest (Banking) Group established a charitable fund in 1994 to make a significant contribution to the society in which it operated. One of its first projects was to investigate financial literacy and to consider how an educational program might be fitted into the secondary school curriculum (Schagen and Lines, 1996). Following the publication of the findings of that research, NatWest sponsored a new financial literacy scheme for secondary schools (Edwards, 1997, p. X).

In the USA, the Federal Reserve Board was so concerned with the lack of basic financial skills among high-school leavers that in 1995 it funded the *Jump$tart Coalition for Personal Financial Literacy* (www.jumpstart.org, August 2002). Chase Manhattan Bank has taken up the cause of promoting the improvement of financial literacy by subsidising financial education. Since 1998, the Bank has spent $US5.5 million on 170 grants to programs which deliver financial education (*Education USA*, 19 February 2001, p. 8). Alan Greenspan, the chairman of the US Federal Reserve Board, views financial literacy as 'a tool for economic progress' and a means to prevent 'abusive lending practices that target…vulnerable segments of the population…[which] result in unaffordable payments, equity stripping and foreclosure' (Greenspan, 2002, p. 41).

Australians are not immune to the financial illiteracy problem and symptoms here, just as elsewhere, abound. Household debt has risen much faster than household disposable income; in 1992, the ratio of household debt to disposable income was about 1:2 or 50% but, by 2002, this value had risen to 1.1:1 or 110% (RBA, 2002, p. 20). Uninformed people fall prey to financial scams. The Australian Securities and Investments Commission (ASIC), set up to promote confidence in the financial system and to protect financial consumers, maintains an informative web site with a special education section known as 'fido' to try to protect consumers (http://fido.asic.gov.au, August 2002).

As is apparently the case in many other developed countries, the education system in Australia outside the dedicated business, finance and economics courses at tertiary level appears to put little emphasis on financial education so that high-school leavers are little prepared for the major, and minor, financial decisions in life. Anecdotally, people gain their financial knowledge largely through trial and error.

This research was undertaken as the prelude to a larger project to determine the financial literacy of the Australian population. Measuring the current state of preparedness provides a benchmark against which any improvements gained through financial education programs may be measured at a later stage. Additionally, the research instrument was structured so that the areas most or least in need of improvement were highlighted. The cohort sampled as the research population was

the student body at the University of Southern Queensland (USQ) located at Toowoomba in south-east Queensland.

This paper briefly reviews the financial literacy literature in the next section. The following section reports the research methodology in terms of the data collection and analytical method. The penultimate section reports the findings and discusses the results and the final section concludes.

2   Brief Review of the Literature

The financial literacy literature may be readily classified into two classes: evaluations of individual financial literacy education programs and tests of financial literacy among differing cohorts or populations. Huddleston and Danes (1999) examined the impact of a high-school financial planning program on a national sample of students in the USA. They found that teaching personal finance (PF) in high schools can increase financial knowledge and have a positive impact on both teenage financial behaviour and subsequent behaviour as adults. Further, they urged that PF become a mandatory component of consumer education in schools (Huddleston and Danes, 1999). At that time, only seven states of the 50 in the US required such programs.

Chatzky (2002), when commenting on the PF education of American teenagers, agreed that the majority are not getting such education, but even those that are being exposed to money matters do not appear to retain much of the content. She relied on evidence that the average high-school senior was able to answer only 50% of 31 *Jump$tart Coalition for Personal Financial Literacy* multi-choice PF questions correctly, whilst students who had completed a money-management course were only able to answer 48% correctly. After investigating what may have 'gone wrong' with the program, she suggested the following: PF education does not have 'a home' in US schools and high school is too late to start to teach it.

In some US schools, PF is taught as consumer economics, in others as economics, in some others as social studies and in others again as mathematics. In some schools, the first three disciplines are electives and, in others, the mathematics stream is divided into high and low streams with PF typically being in the low stream. Many students miss out, and high achievers have a high chance of missing such education, yet they are the students who later typically have to deal with repaying student loans. On the timing of PF education, Chatzky (2002) argued that financial education is more effective before people start to practise, yet 7% of US teenagers have their own credit cards and 18% have access to their parents' cards.

Among the group of papers that investigate financial literacy, Schagen and Lines (1996) undertook an investigation of financial literacy in UK adults for the NatWest Group Charitable Trust as mentioned in the introduction to this paper. In selecting their sample, Schagen and Lines (1996) recognised that some groups were particularly susceptible to difficulties with debt. These groups were: (a) young people aged 16-21 years in work or training, (b) students in higher education and not living at home, (c) single parents on benefits and (d) families living in subsidised housing. The selected sample included one-sixth selected from each of the above groups and one-third selected from the general public.

In the Schagen and Lines (1996) study, respondents were asked about their attitudes to saving and borrowing, their use of banks and building societies, how they managed their transaction accounts, who managed the money in family groups, and about their confidence in handling money matters. In addition, they were asked questions to test their knowledge of financial markets and instruments, of financial decision-making, of solving financial problems and of financial planning.

Generally, Schagen and Lines (1996) found the general public were committed to saving and to avoid borrowing more than they could afford to repay. The majority with bank transaction accounts claimed to keep detailed records and most others said they knew roughly their current balances. They were reasonably confident in dealing with financial affairs. In contrast, single parents were least likely to be committed to saving and to have bank accounts. Almost all students had such accounts, but few kept good records. Students were least confident in dealing with financial affairs.

Four papers stand out among the US literature. Williams-Harold and Smith (1999) reported a survey of 500 teenagers about saving and investing. About 70% of them had a savings account, 11% owned equities and about 30% had sought financial advice. Even though 56% had taken a money-management class, only 31% reported being able to balance a bank account, 23% were familiar with use of credit cards, 12% were confident of their ability to decide among various bank accounts, 7% were aware of current interest rates and 9% were familiar with debit cards.

DollarSense (1996/97) reported a simple survey of 1001 investors to determine their knowledge of and skill in selecting financial products. Eight basic multiple-choice questions were used. Baby boomers (aged 32-50 years at the time) scored relatively well, but both younger and older people did poorly. Men outstripped women in the 'very knowledgeable' category, whilst 39% of women fell into the least knowledgeable category with fewer than 50% correct. About 44% of over-65 years olds scored less than 50%.

Similar results were found in a much more complex study by Cutler (1997) who found that the US population needs much more financial education and needs to have exposure to that education considerably earlier. Chatzky (2002) came to the same conclusion. Cutler (1997) particularly singled out baby boomers and found that, even though boomers admitted to some superficial knowledge of, for example, unit trusts [mutual funds], only 29% were confident of making a good choice as an investment. The lowest levels of familiarity and knowledge among boomers and others were of health care rights attached to retirement income streams and of US Medicare eligibility. Less than half the sample knew that Medicare will not pay for nursing home care of Alzheimer's patients. Cutler (1997) concluded that the American public is not well informed about financial matters, especially long-term issues such as insurance, social security and health care. Arguing against colleagues' claims that an age-linked need-to-know mechanism was at work and people will find out when they need to, Cutler (1997) asserted that boomers are increasingly being called upon to support aged parents. Lack of foresight and planning for parents' support could bring personal financial disaster for boomers.

Finally, Chen and Volpe (1998) analysed PF literacy among 924 students at 14 colleges. Participants were asked to answer 52 questions including 36 multiple-choice

questions on PF. The survey instrument also investigated opinions on financial matters and asked a set of demographic questions. The authors marked the responses and calculated the percentage of correct responses for each question. Aware of the different levels of financial literacy among sub-groups of the sample, they analysed the variation using logistic regression modelling. Participants were classified into two groups according to their percentages of correct answers. Those with higher than the median percentage were classified as having more knowledge and those with lower than the median as having less knowledge. The dichotomous variable was then used in the logistic regression as the dependent variable. Eight independent variables were included in the model to explain the dependent variable. The model was found to have high explanatory power.

The independent variables included type of course (business or not), year at college, sex, race, nationality, work experience, age and income. The less knowledgeable group was found to be highly likely not to be studying business, but to be from lower classes (i.e. not in final-year undergraduate or graduate classes), to be female and to have less work experience and to be under 30 years of age. Race, nationality and income were found to be not significant. Chen and Volpe (1998) concluded knowledge of PF among US college students was generally poor with the overall mean correct-answer score at 53% and none of the mean scores for general financial knowledge, saving, borrowing, insurance or investments above 65%.

3 Research Methodology

This research was conducted among students at the University of Southern Queensland (USQ) in Toowoomba, Queensland, during the first semester of 2002. USQ has a student enrolment of about 22 000 with more than 5 000 students studying on-campus and the remainder externally. About 4 000 international students study offshore in 60 countries and a further 800 international students attend on-campus. There are five faculties: Arts, Business, Education, Engineering and Surveying, and Sciences including Nursing, with Business by far the largest faculty (USQ, 2002).

3.1 Data Collection
The survey instrument was administered as a paper version to students in all faculties. First-year students were targeted in most faculties but, because some of the classes to which the survey was administered were in subjects which students from many faculties take as electives and which may be taken out of normal sequence, possibly not all such students were in their first years. In addition, USQ has a high enrolment of mature-aged students. Hence, it cannot be assumed that the average student is an 18-year old school leaver who has never been in the workforce. In fact, as Table 2 shows, only 11.7% of the sampled students had never been in the workforce.

Students majoring in Business disciplines were only approached in first-year first-semester units. The rationale for this choice was that students in any year of study throughout the university would be acceptable as representative of a typical university student with respect to financial knowledge, with the exception of Business majors, who should improve their financial knowledge as they complete further years of study.

Further, the head of the Psychology department was aware that many psychological problems in the community are connected with financial difficulties and that practising psychologists should have an understanding of PF issues. He was interested in gaining an understanding of the levels of financial skill among his students. Hence, students studying psychology as a major and some post-graduate psychology students were targeted. The survey instrument was presented as an electronic version on the internet and students were requested to complete it. (To overcome the potential loss of anonymity, these respondents were requested to post their completed forms back to USQ.) Psychology students gain a very small reward in the assessment process by completing a number of questionnaires during the semester, as part of the teaching of data-gathering techniques. The 13.7% postgraduate respondents all came from the psychology group.

A total of 837 questionnaires was completed, with 789 having complete data sets. Table 1 provides the breakdown of responses by faculty or department. Table 2 gives details of the demographic characteristics of the respondents.

Insert Tables 1 and 2 here

3.2 Survey Instrument
The survey instrument was designed in several stages. Initially, consideration was given to the knowledge and skills necessary for a person to be considered financially literate. Colleagues in the finance and law departments were consulted. It was decided the general areas should be basic financial concepts, financial markets and instruments available, financial planning, making financial analyses and decisions and insurance as a risk management tool.

While financial academics can write any amount of multi-choice questions to test financial knowledge and skills, the researchers were well aware of the need to keep the questionnaire as brief as possible. A total of 25 technical four-option multi-choice questions spread roughly equally over the five general areas was decided upon, and the questions written. Additionally, nine questions asked for demographic information and a tenth question investigated respondents' risk tolerance using degrees of agreement with four statements by means of five-point Likert scales. The instrument was pilot-tested among colleagues and students, and amendments made to improve meaning and flow.

3.3 Methodology
The methodology used was very similar to that of Chen and Volpe (1998). Responses were marked and the percentage of correct responses for each question calculated. The responses for each area of skill or knowledge were analysed to determine the frequency distributions of correct responses. The major analytical method used was logistic regression modelling.

Participants were classified into two groups, high achievers and low achievers, to construct a dichotomous variable of the results. The division between the two could have been made on the basis of one of a number of criteria: more or less than 50% correct, the mean, the weighted mean or the median. The decision was made to divide the data at the median, as this division gave two groups almost equal in numbers of respondents. Thus, each group was as large and included as much variation as

possible in the determinant factors. The dichotomous variable was then used in the logistic regression as the dependent variable which is explained by all of the independent variables. Additionally, the same methodology was used to analyse the responses for each of the five skill areas.

4   Findings and Discussion

Table 3 gives the percentage of correct answers for each question for each of the skill areas.

Insert Table 3 here

Basic Concepts   The first few questions tested simple concepts in finance such as the effect of compounding interest and the relationship between risk and return. The questions best answered asked about how saving is achieved and gave 'the disciplined use of money' as well as several distracters. Students correctly answered in 97.1% of cases. Another question in this set asked about early withdrawal penalties with financial products and 80.4% of students were able to name 'term deposits' correctly. A further question posed a situation of higher returns than normal for a particular investment and asked about expected risk. This was answered correctly in 74.2% of cases.

The questions worst answered required an analysis of the balance in a bank account where an initial $100 had been deposited for one year at 12% simple interest versus at 1% per month compound interest. The choices available were $112, more than $112, less than $112 and can't say. This question was answered correctly by 52.9% of respondents, but 29.0% of students thought there was no difference between simple and compound interest and 15.7% thought earning compound interest would result in a lower asset balance at the end of a given earnings period. The reason for diversifying an investment portfolio was covered in another question; 58.5% of respondents answered correctly with another 34.1% of students distracted by 'the desire to increase returns'.

Markets and Instruments   Of the financial markets and instruments questions, the question most frequently correctly answered was on the nature of the liability undertaken when guaranteeing a friend's loan with 87.5% correctly indicating full responsibility if the friend defaults. About 60% of students were able to identify correctly how the price of Australian currency in US dollars is set and the relationship between fixed and variable interest rates for housing loans. Despite the fact that the cash rate is discussed possibly at least once every week by every news media, only 44.1% knew the role of the cash rate in the economy. Perhaps surprisingly, only 36.7% could correctly identify which Australian asset class has given the best returns over the last two decades.

Planning   Among the planning questions, the best answered was on the advantage of keeping a daily track of expenditure (91.1% correct). Similar high numbers of respondents (85.0%) were aware that checking their bank statement allowed them to keep abreast of interest rates and bank charges. The worst answered question in this set was about the method of effecting a bank reconciliation.   Only 27.9% of respondents were able to indicate the correct method of subtracting outstanding cheques from the apparent balance on the statement to achieve the actual balance.

Analysis and Decisions   Making analyses and solving financial problems together with knowledge of insurance matters were the areas which respondents generally answered least well. The best-answered question involved mortgage-buster or savings offset accounts (64.5%) correct. About 58% of respondents were able to identify correctly the best method to rectify a persistent credit card debt, while 43.1% were able to solve a simple present value problem couched in terms of a lotto lump sum or annuity prize. The two financial-problem questions showing the most deficiency in knowledge or skills involved an asset-rich, cash-poor person getting funds quickly for an urgent medical procedure (36.3% correct) and a calculation of the best deal on a motor vehicle with differing trade-in values and interest rates and conditions (33.0% correct).

Insurance The best-answered question involved the determinants of vehicle insurance premiums (77% correct). About 57% of respondents understood the nature of insurance excesses and 42% identified the risks covered by compulsory third party (CTP) vehicle insurance. The worst-answered two insurance questions involved flood not normally being covered by householders' policies (31.6% correct) and the nature of term life insurance (21.5% correct).

Table 4 reports the proportions of respondents who gained nil to five correct answers in each of the skills or knowledge areas. Table 5 provides the percentages of respondents who gained certain ranges of correct responses and whose skills may be classified from excellent to very poor. No respondent gained a score of 25 and no respondents gained zero or one correct response. The absolute range of correct responses was thus two to 24. The mean was 13, the weighted mean 14.8, the median 15 and the mode 15.

Insert Tables 4 and 5 here

The independent variables used in the logistic regression modelling were faculty or major discipline of study (MAJ), sex, household type (FAM), age, education (EDU), usual occupation (OCC), current employment status (WORK), workforce experience (EXP), income (INC) and risk preference (RSK). Table 6 indicates how the variables were constructed and their *a priori* expected signs. Most of the variables are expected *a priori* to have positive signs, i.e. the higher the level of education gained, the higher the expected level of financial literacy. For sex and WORK, however, it is not possible to have a prior expectation of the sign of the variable. Moreover, the risk preference questions were scored so that less risk-averse respondents scored lower in aggregate than more risk-averse people. A negative sign of this variable is thus expected. People with high aggregate risk preference scores are likely to have less experience, knowledge and confidence in financial matters. Thus, a high score in this factor will tend to depress the financial skills and knowledge score.

In the first model, the dependent variable was, as explained in the methodology section, a dichotomous variable (1 or 0) indicating whether each individual respondent had scored more or less than the median result. The results with the use of Shazam software, Version 7, are reported in Table 7. The Cragg-Uhler R^2 for the model was an acceptable 0.182. Estimated coefficients significant at the 0.05 level are

marked with an asterisk. There are no estimated coefficients in this model which are significant at the 0.10 level.

Insert tables 6 and 7 here

As can be seen from the table, the significant variables in this model are sex, work experience, income and risk preference. Being male, having greater work experience and higher income contributed to higher scores. The negative sign of the risk preference variable was expected. People with high aggregate risk preference scores are likely to have less financial experience, knowledge and confidence and a high score in this factor will tend to depress the financial skills and knowledge score.

Following the running of this full model, five separate models were estimated using the median correct-answer scores to define the two groups for each of the skills and knowledge areas. Table 8 provides the estimated coefficients and notes the variables found to be significant at the 0.05 level with an asterisk and at the 0.10 level with double asterisks.

Insert Table 8 here

The Cragg-Uhler R^2 values are not high for the final four models, and this indicates that other independent variables are affecting the dependent variable. This finding is substantiated by the paucity of significant determinant variables in these models. The Cragg-Uhler R^2 value for the first model is more acceptable and, as can be seen from the table, this model has five independent variables, major, sex, occupation, experience and risk preference, which impact significantly on the dependent variable. This model suggests that studying business disciplines, being male, working at a more highly skilled occupation and having more work experience will impact positively on financial knowledge and skills. Similarly, being less risk averse will not decrease financial literacy scores as much as being more risk averse does.

5   Conclusion

This study has surveyed a wide cross-section of the student population of a regional Australian university with a substantial external-student enrolment. First-year Faculty of Business students as well as students in other faculties or disciplines were targeted. The research has found that financial literacy is not high and this, no doubt, stems from the lack of financial-skills education in high schools. Of the five identified areas of financial skill or knowledge, decision-making skills and knowledge of insurance appeared to be the least well developed. The weighted average score for decision-making skills was 47% and for knowledge of insurance was 46%.

Respondents scored reasonably well for basic concepts, but the questions were simple. The most difficult question tested basic knowledge of compound interest (with no calculation involved) which only 52.9% of respondents answered correctly. Similarly, the planning questions tested low-level skills and knowledge, but only 27.9% of respondents appeared to understand the method for effecting a bank reconciliation.

The regression modelling reinforced the initial summary results. Financial literacy improved with work experience and income. This suggests that people learn financial skills through trial and error, to some degree. Additionally, financial experience tends to impact on tolerance to risk. Thus, those people indicating higher tolerance to risk (less risk averse) are probably those with more exposure to the financial markets and more experience in financial management and investment. Finally, students undertaking business studies, even they were in their first year at university, scored better. This result was probably due to a higher inherent interest in financial matters, a greater level of directed reading and more attentive listening to financial reports on the media.

In concert with the findings of Chen and Volpe (1998) in the USA, university students in Australia are not skilled, nor knowledgeable, in financial matters. This lack of financial skill will tend to impact negatively on their future lives through incompetent financial management. It also does not auger well for the national economy where skilled agents operating at a high level of competence tends to be an assumption made by both governments and business. The lack of a comprehensive financial education program in both primary and secondary schools is evident. The sooner such a program is put in place in all states, the better will be the outcomes for both individuals and the economy as a whole.

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TABLE 1
RESPONSES RECEIVED BY FACULTY OR DEPARTMENT

Faculty or Department	No. Responses
Arts	25
Business	225
Education	203
Engineering	31
Psychology	313
Preparatory studies and other	40

TABLE 2
DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS (%)

	Characteristic	Frequency (%)
Sex	Male	36.8
	Female	63.2
Household status	One person	46.9
	Family with dependants	43.0
	Family with no dependants	10.1
Age (years)	<18	15.4
	18-24	51.8
	25-44	29.5
	>45	3.3
Educational status	Undergraduate	86.3
	Postgraduate	13.7
Employment status	Unemployed	49.1
	Employed	50.9
Time spent in workforce (years)	0	11.7
	0.1-5	50.6
	5.1-10	16.2
	>10	21.3
Income	<$20 000	55.1
	$20 001 - $30 000	13.2
	$30 000 - $50 000	12.0
	$50 001 - $70 000	10.2
	>$70 000	9.5

TABLE 3

PERCENTAGE OF CORRECT ANSWERS FOR EACH QUESTION (%)

Area and specific focus of each question	Correct answers (%)
Basic concepts:	
Compound interest	52.9
Risk and expected return	74.2
Diversification of portfolio	58.5
Achievement of saving	97.1
Early withdrawal penalty	80.4
Markets and instruments:	
Price of AUD	61.4
Definition of 'cash' rate	44.1
Historical returns of Australian asset classes	36.7
Loan guarantee	87.5
Fixed and variable rates	58.1
Planning:	
Effectiveness of planning	66.6
Bank reconciliation	27.9
Expenditure recording	91.1
Checking bank statements	85.0
'Free' credit	77.7
Analysis and decisions:	
'Mortgage buster' / loan offset accounts	64.5
Persistent credit card debt	58.5
Source of urgent funding	36.3
Monetary problem solving	33.0
Present value of income stream	43.1
Insurance:	
Insurance excess	57.4
Risks covered with householders' policies	31.6
Vehicle insurance premiums	77.0
Risks covered with vehicle CTP policies	42.3
Term life insurance benefits	21.5

TABLE 4

PROPORTIONS OF RESPONDENTS GAINING 0-5 CORRECT ANSWERS IN EACH AREA

Area	Proportion of respondents with correct answers (%)					
	0	1	2	3	4	5
Basic concepts	0.6	3.4	14.2	24.0	29.8	28.1
Markets and instruments	1.6	8.4	25.4	35.8	22.5	6.1
Planning	1.3	3.6	10.0	29.7	41.2	14.2
Analysis and decisions	7.6	19.1	27.8	25.3	15.8	4.2
Insurance	6.4	21.9	27.6	26.5	14.6	2.9

TABLE 5

PROPORTIONS OF RESPONDENTS GAINING GIVEN RANGES OF CORRECT RESULTS

Grade of skill	Range of correct results	Proportion of respondents (%)
Excellent	22 - 25	3.0
Good	17 - 21	30.6
Average	12 -16	46.3
Poor	7 - 11	18.1
Very poor	0 - 6	2.1

TABLE 6

CONSTRUCTION OF INDEPENDENT VARIABLES WITH THEIR A PRIORI EXPECTED SIGNS

Variable	Construction	Expected sign
MAJ	1 = business; 0 = Other	+
SEX	1 = male; 0 = female	+ or -
FAM	1 = single person household; 2 = family with dependants; 3 = couple with no dependants	+
AGE	Six values comprising age classes from <18 year to 75 years and over	+
EDU	Five values comprising classes from mid-secondary to postgraduate	+
OCC	Seven values comprising classes from student through unskilled, administrative, manager, professional to retired	+
WORK	1 = unemployed; 0 = employed	+ or -
EXP	Eight values comprising classes from 0 to more than 30 years	+
INC	Seven values comprising classes from less than $20 000pa to more than $150 000pa	+
RSK	The Likert scores for the four risk preference questions were added to give an aggregate score after transposing the scores for one question which ran in the opposite direction from the other three.	_

TABLE 7
RESULTS OF LOGISTIC REGRESSION MODELLING – FULL MODEL

Variable	Estimated coefficient	*t*-ratio
MAJ	0.1867	1.049
SEX	0.3741*	2.282
FAM	0.1336	1.052
AGE	0.1275	0.891
EDU	-0.0766	-0.758
OCC	0.0736	1.241
WORK	0.0712	0.457
EXP	0.3181*	3.670
INC	0.1605*	2.484
RSK	-0.1446*	-4.274
constant	0.0570	0.111
Cragg-Uhler R^2	0.182	

Note: Variables marked * are significant at the 0.05 level. There are no variables significant at the 0.10 level in this table.

TABLE 8
RESULTS OF LOGISTIC REGRESSION MODELLING – SKILL/KNOWLEDGE AREAS MODELS

Variable	Estimated coefficients for each model				
	Concepts	Markets	Planning	Decisions	Insurance
MAJ	0.3943*	0.1324	0.2881**	0.4429*	0.0609
SEX	0. 8765*	0.0170	-0.3388*	0.3449**	0.1960
FAM	0.0730	-0.1340	-0.0271	0.2071**	0.0987
AGE	0.1149	0.0184	0.0143	0.2082	0.1170
EDU	0.0078	0.1676**	-0.0527	-0.0958	-0.1884**
OCC	0.1341*	0.0095	0.0428	-0.0648	0.0272
WORK	-0.0304	0.0865	-0.0848	0.1506	-0.1831
EXP	0.2323*	0.1958*	0.1216**	0.0712	0.3786*
INC	0.0573	-0.0170	0.1015**	0.3053*	0.1619*
RSK	-0.0878*	-0.1257*	-0.0695*	-0.0761*	-0.0609**
constant	-0.2376	1.2800	0.6885	0.3907	0.5084
Cragg-Uhler R^2	0.163	0.059	0.044	0.102	0.121

Note: Variables marked * and ** are significant at the 0.05 and 0.10 levels respectively

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