

The Role of Financial Experience in Creating Financial Knowledge

Bart Frijns, Aaron Gilbert* and Alireza Tourani-Rad

Department of Finance, School of Business, Auckland University of Technology

*Corresponding Author: Aaron Gilbert, Department of Finance, Auckland University of Technology, Private Bag 92006, 1020 Auckland, New Zealand, Email: agilbert@aut.ac.nz, Phone: +64 9 921 9999 ext 5713.

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Abstract:

In this paper, we examine the causal effect of financial experience on financial knowledge. Exploiting a unique feature of New Zealand, which only allows domestic students to obtain interest free student loans and to participate in the national retirement scheme, we employ an instrumental variables approach to identify the causal effect of financial experience on financial knowledge. Using survey data on a sample of 338 first year business students, we find that there is a positive and causal effect of financial experience on financial knowledge. Our results therefore suggest that financial education programs may be more successful when containing experiential components.

JEL Codes: A20; G00.

Key Words: Financial Knowledge; Financial Education.

I. Introduction

In recent years, policy makers and regulators have been giving more and more attention to the problem of poor financial understanding and knowledge of individuals. With a move to greater individual responsibility for financial decisions (e.g. with regards to retirement savings) and the ever increasing complexity of financial products and markets, it is more important than ever for people to be able to make sound financial decisions (Van Rooij et al., 2011). The extant evidence however suggests that people are not usually capable of making sound decisions, and many studies have shown that considerable portions of the population display low or moderate levels of financial understanding (CFS, 2001; ANZ, 2003; OECD, 2005; FSA, 2006a; Lusardi, 2011; Colmar Brunton, 2005, 2009). The result of the low level of financial understanding is an increased propensity to make financial mistakes with potentially serious consequences. These consequences have been highlighted recently and include being more prone to borrowing from predatory lenders (Hilgert and Hogarth, 2003), excessive use of debt, in particular high cost debts like credit cards (Lusardi and Tufano, 2009), saving too little (Bell and Lerman, 2005) and making little or no provision for retirement (Lusardi and Mitchell, 2009).

A key underlying assumption made by policy makers is that improved financial knowledge through education programmes affects the behaviour and decision making of individuals (Hilgert and Hogarth, 2003). This has resulted in considerable efforts around the globe to improve the financial literacy through educational programmes in high schools (Mandell, 2008) and workplaces. However, the effectiveness of these programmes is questionable (Braunstein and Welsh, 2002). It may be that financial knowledge is not only increased through education, but also through other channels such as experience. This potential explanation is highlighted by Mandell (2008) who shows that high school financial education programmes are more effective when containing experiential components, such as stock market games. In this paper, we assess the causal effect of financial experience on financial knowledge.

The problem of assessing the causal effect of experience on knowledge is that both experience and knowledge are most likely to influence each other. This means that more experience may lead to greater financial knowledge, but the reverse may also be the case, i.e. financial knowledge leads to greater financial participation, leading to greater experience. This results in a positive correlation between experience and knowledge (as has been documented by many studies), but does not suggest the direction of causality. Consequently, not knowing the direction of causality can lead to poorly designed educational programmes. If experience increases knowledge, but the reverse is not the case, then education programmes purely focused on increasing financial knowledge may be less than effective. The literature has typically assumed that increased knowledge leads to more experience, interpreting a correlation as a causal relationship. This has largely been due to the difficulty of establishing causality. In this paper, we exploit a unique feature of New Zealand, which enables us to identify the causal effect of experience on financial knowledge.

The aim of this paper is to examine the role financial experience has on people's level of financial knowledge. We develop a survey containing questions that measure the respondent's financial knowledge, their financial experience, and personal characteristics. This survey is administered to 338 first year students at the Faculty of Business and Law at Auckland University of Technology in 2011. To assess the causal effect of experience on knowledge, we exploit the existence of several financial products that are only available to permanent residents and citizens, specifically KiwiSaver and student loans.

Our results show that the respondents get less than half the financial knowledge questions correct. Given the basic nature of the concepts being tested, this represents a relatively poor level of understanding. We show that those aged 18-24 and women perform significantly worse, while those with European ethnicity perform better than others. Our data, further, shows many respondents have experience with savings accounts, KiwiSaver, student loans and credit cards. Few have experience with more sophisticated instruments like stocks, bonds and mutual funds. In line with previous literature, we find a positive correlation between financial experience and knowledge. However, unlike previous studies, we find a significant causal effect of experience on knowledge, suggesting that greater financial experience leads

to greater financial knowledge. This result suggests that there may need to re-evaluate the design of financial education programs currently employed.

The rest of this paper is structured as follows. Section 2 discusses the reverse causality issue. Section 3 discusses the survey employed and discusses the respondents the survey was administered to. Section 4 presents our results while Section 5 concludes.

II. The Endogeneity Problem

2.1 The Problem

The literature has established a positive correlation between financial knowledge and experience. This typically has been given a causal interpretation, where it has often been assumed that greater financial knowledge leads to greater financial experience. However, it can be argued that the reverse may also be the case, i.e. greater financial experience may lead to greater financial knowledge. A simple correlation between two variables (or a cross-sectional regression of one on the other), however, cannot identify the causal relationship between them. Technically, this issue is known as endogeneity, where both knowledge and experience are (potentially) determined simultaneously.

To further illustrate the endogeneity issue, consider the following two models,

$$F.K_i = \alpha_1 + \beta_1 F.Exp_i + Controls + \varepsilon_i, \quad (1)$$

and

$$F.Exp_i = \alpha_2 + \beta_2 F.K_i + Controls + \eta_i, \quad (2)$$

where the first equation aims to explain financial knowledge by financial experience (and other factors), and the second equation aims to explain financial experience by financial knowledge. However, OLS estimation of Equations (1) and (2) is not able to distinguish

between β_1 and β_2 . To further illustrate the problem, Equation (1) can be rewritten into Equation (2), i.e.

$$\begin{aligned}\beta_1 F.Exp_i &= \alpha_1 + F.K_i + Controls + \varepsilon_i \\ F.Exp_i &= \alpha_1 / \beta_1 + 1 / \beta_1 F.K_i + Controls / \beta_1 + \varepsilon_i / \beta_1\end{aligned}\tag{3}$$

This shows that Equation (2) is essentially a re-written version of Equation (1), where $\beta_2 = 1/\beta_1$.

The problem can also be considered from a mathematical point of view. In Equations (1) and (2), we are trying to capture two different effects: 1. the impact of experience on knowledge; and 2. the impact of knowledge on experience. However, as Equation (3) illustrates, we only have one equation. Mathematically, we cannot solve a problem with two unknowns but only one equation.

2.2 The Solution

The solution to the endogeneity problem presented in Section 2.1 comes through the use of instrumental variables. An instrumental variable can be thought of as a variable that allows for either β_1 or β_2 to be identified. More specifically, it is a variable that is highly correlated with one of the endogenous variables, but has no marginal impact on the other endogenous variable. In our case, we have an instrumental variable for Financial Experience, which enables us to identify β_1 in Equation (1), i.e. the causal effect of financial experience on financial knowledge.

The role of an instrumental variable can be best explained using the plot in Figure 1. This graph shows the relationship between financial knowledge and experience, where the bold printed line shows Equation (1) (i.e. the causal effect of financial experience on financial knowledge) and the thin printed line shows Equation (2) (the causal effect of financial knowledge on financial experience). Because we have an instrument for financial experience, i.e. a variable that is highly correlated with financial experience, but has no marginal effect on financial knowledge, we essentially have a variable that shifts the Financial Experience equation up and down vertically, without causing a change in financial knowledge. It is this

shifting of the Financial Experience Equation that enables us to identify the slope coefficient in Equation (1), i.e., β_1 .

2.3 The Instrumental Variable

Through the survey we conduct, we construct our measure of financial experience. This measure is based on questions whether students have experience with financial products, such as savings accounts, term deposits, mutual funds, etc. Part of these financial experience questions asks whether these students have a student loan, and whether they participate in KiwiSaver. Having experience with all these financial products is combined into a single financial experience score. Given the fact that student loans and KiwiSaver are only available to domestic students (NZ citizens or permanent residents), we expect that our measure of financial experience is higher for domestic students than for international student. Moreover, we do not expect that there is an innate difference in financial knowledge between domestic and international students (beyond the fact that domestic students may have more financial experience through student loans and KiwiSaver). We therefore suggest that a dummy variable for whether a student is international or not, will make a good instrument for financial experience, and will allow us to assess the causal effect of financial experience on financial knowledge.

III. Survey and Sample

We assess the relationship between financial experience and knowledge by conducting a survey on 338 first year students at the Auckland University of Technology Faculty of Business and Law. We select first year students in 2011, because they have had either no or little exposure to academic teaching on financial concepts and therefore represent a sample with relatively comparable knowledge to the general public. Further, New Zealand university students are likely to contain a significant number of individuals with student loan exposure and international students, who are ineligible for KiwiSaver and student loans, which is needed to make our instrumental variable effective.

The survey contains 19 questions covering three areas: understanding of financial concepts; financial activity and experience; and demographics. Understanding of financial concepts is tested in eight questions covering time value of money, compounding interest, diversification, real vs. nominal interest rates, risk, market effects of interest rate changes, how loans function and financial planning. These topics have been included in other surveys testing financial literacy, including the Financial Knowledge Survey (Colmar Brunton, 2009) conducted in New Zealand on behalf of the Retirement Commission, the Financial Literacy of Young American Adults (Mandell, 2008) and the Financial Capability around the World Surveys (Lusardi, 2011) conducted by the Financial Literacy Center at Dartmouth University. These questions represent pre-tested and validated questions (see Appendix 1 for the full survey). We construct an overall financial knowledge score by summing the number of correct responses to the eight financial literacy questions.

Respondents are further asked about their experience with various financial instruments that are common in the New Zealand market. These include savings accounts, credit cards and various types of common debt and financial assets. The final set of questions is related to the demographics of the respondents. Prior financial literacy surveys have established that various demographic features are indicative of those with better financial literacy including age, gender, ethnicity and wealth. We proxy for the effects of wealth by looking at the education of the parents. We also consider the educational background of respondents in high school as certain subjects are likely to indicate either an interest or specific education on financial topics.

IV. Results

4.1 Sample Composition

Panel A of Table 1 discusses the composition of the sample broken down by demographics. We expect that our sample will be composed of relatively younger students, as a result we split respondents into an 18-24 category and a 25+ category. We observe that 85% of the sample falls into the young adult category while 50 respondents are 25 or older. The sample is relatively even in terms of gender, 50.7% of the sample were male. We note that the

sample is dominated by respondents who identified themselves as Asian, including Chinese and other Asian categories, (41%) followed by Europeans (30%). Respondents identifying themselves as Maori or Pacifica and Indian or other Middle Eastern were around 10-15% of the sample.

We look at parent's education as an indicator of wealth, which has been shown to affect the level of financial experience of individuals. The highest level of education is High School (40%), followed by Bachelor's degree (30%), Trade certificates (18%) and graduate and post graduate degrees (14%). Those respondents where neither parent completed high school is the least common response at less than 5%. Finally, we examine whether respondents had studied particular subjects in High School that may impart financial knowledge such as business subjects or mathematics. We observe that Accounting (31%) and Business Studies (26%) occur at similar rates while Economics (40%) is more prevalent in our respondents. Mathematics in contrast, occurred at nearly twice the rate of more business orientated subjects (67%).

Panel B of Table 1 presents the financial experience of the respondents. We split experience into assets and liabilities as they are likely to represent different experiences. Liabilities in particular are likely to represent situations where people have made poor financial decisions and therefore do not represent good experiences. We observe that while more than half the respondents save on regular basis, experience with other financial assets is relatively low. 38% of the sample has a Kiwisaver account. Term deposits were the next most common (21%), but experiences with more sophisticated instruments like stocks, bonds and mutual funds are especially low, between 4 and 7%.¹ Respondents' experience with liabilities is equally limited. Over half the sample has experience with Student Loans (60%), but other experiences are more limited. Only 40% of the sample has a credit card, and less than 20% of the sample has experience with personal loans and hire purchases.

¹The lack of investment experience may be due to the youth of the sample and the lack of disposable income available to the respondents.

4.2 Financial Knowledge Scores

To examine the financial knowledge of our respondents we create a financial knowledge score based on the number of correct responses to the 8 financial understanding questions in the survey. Overall, the respondents had an average financial knowledge score of 3.97. Figure 2 demonstrates a nearly normal distribution of the financial knowledge score. The majority of respondents scored either a 3 or a 4. Overall, this represents a relatively low level of financial knowledge and suggests that efforts need to be made to address this issue. To put the results in context, Lusardi (2011) notes that New Zealanders in general correctly answered questions on compounding, real interest rates and diversification 86%, 81% and 27% of the time. In our sample, respondents got equivalent questions correct 70%, 65% and 30% of the time, a considerably worse performance on compounding and real interest rates. This is likely a result of 18-24 year olds lower financial knowledge than the general population as shown in the ANZ Retirement Commission surveys.

Panel A of Table 2 splits the sample based on the demographic factors and shows significant differences in financial knowledge based on some of these factors. On average, older individuals, who may be expected to have greater financial knowledge as a result of greater exposure to financial matters, score slightly higher although not significantly so. We observe that male respondents have a significantly higher financial knowledge score (0.45 points better). There are also significant differences between the scores of different ethnicities, specifically students with a European background score half a point higher than non-Europeans while Indian students scored 0.7 less. Neither the education of parents, nor the subjects that respondents themselves studied at high school have a significant impact on the level of financial knowledge. The latter is supportive of the Mandell's (2008) findings, who reports that high school programs teaching financial education in the US were largely ineffective in improving knowledge.

Panel B of Table 2 presents evidence on the relationship between financial experience and knowledge. We observe that there are significant differences in respondents' knowledge based on their experience with four particular financial products, stocks and Kiwisaver on the

asset side and credit cards and personal loans on the liabilities side. Interestingly, credit cards are actually associated with a significant decline in financial literacy implying that those without credit cards are more financially knowledgeable. Those with experience of personal loans appear to have more financial knowledge.

4.3 Responses per Question

Table 3 presents the results of the percentage of correct responses for each question sorted by demographic factors. It may be that knowledge around particular areas is more common in particular groups, in the same way that we observed that overall knowledge was higher for those with certain characteristics. However, we observe only limited differences based on the personal characteristics of the respondents.

Age appears to only be a factor in the case of Question 3 as 18-24 year olds display markedly less understanding of diversification. Men only outperformed women significantly on Question 4 which relates to real interest rates. Students of European origin were better in answering Question 1 (time value of money) and Question 4 (real interest rates). Other ethnicities have significant differences with regards to Question 2, compounding interest, where Maori and Pacific, Indian and Other categories underperformed and Asian respondents were correct more often. In addition, Asian respondents do significantly worse on Question 1 as do Indians with regards to Question 4 and Question 8. Similarly, parents' education and previous high school subjects show no consistent pattern and few instances of significance. Parents' education shows that those answering no high school underperformed on Question 5, understanding of risk, those with high school underperform on Question 8, the Trade Certificate category outperformed on Question 1 and those with a Bachelor's degree underperformed on Question 6.

Table 4 presents the percentage of correct responses per question sorted by financial experience. In some instances where we see significant differences, the instrument is related to the concept tested, suggesting there is some relationship between financial knowledge and

experience. For instance, those with experience of term deposits have a better understanding of compound interest while experience of stocks is related to knowledge of risk and financial planning and KiwiSaver experience is linked to an improvement in real interest rates. However, in other cases the significance of the relationship is harder to explain. Experience with bonds is related to better understanding of the relationship between interest and foreign exchange rates, while experience of personal loans is related to less understanding of this relationship. Mutual funds are related to knowledge of credit security and those with a credit card have a poorer understanding of present values.

4.4 Financial Experience

To examine the relationship between financial experience and financial literacy we create two indices based on experience with financial instruments. The first index is the sum of the financial assets that the respondent has experienced plus student loans and subtract experience of other liabilities. We give credit cards, personal loans and hire purchases negative weights as they represent poor financial decisions. For instance, hire purchases typically represent expensive borrowing for depreciating assets. By contrast, we give student loans a positive weight as they are interest free and come with a voluntary repayment bonus of 10% making them potentially very profitable “liabilities”. Our second version of the index is calculated by first grouping the instruments into five categories, savings, investments, KiwiSaver, student loans and debt. Savings was defined as 1 if the respondent had either regular savings or experience with term deposits and zero otherwise, investments was defined as 1 if respondents had experience with either stocks, bonds or mutual funds (and zero otherwise). Debt was defined as 1 if a respondent had experience of credit cards, hire purchase or personal loans (and zero otherwise). The financial experience index was then calculated as the sum of savings, investments, KiwiSaver and student loans less debt. Our two financial experience indices have a correlation of 0.85.

Table 5 presents our financial experience indices split by demographic factors. Overall, there is a high degree of overlap between the two indices in the categories with significant differences. We find that older respondents have lower financial experience scores. It may be

that older respondents have more experience with liabilities which is lowering their score. Students of European origin have significantly higher financial experience scores, while Asian respondents have less. We also observe that students who studied business studies in high school have greater financial experience. In addition to these, our second financial experience index also shows that men and those with parents who did not complete high school have greater financial experience.

4.5 Financial Experience and Financial Knowledge

As discussed in Section 2, one main concern is potential endogeneity between financial experience and financial knowledge. More specifically, while it is easy to argue that there should be a relationship between these two variables, it is difficult to determine the direction of causality. To resolve the endogeneity issues that have prevented previous studies from determining the causal effect of experience on knowledge, we employ instrumental variable (IV) regressions (two stage least squares) using the international student dummy as our instrument. As standard IV regressions assume that the residuals are normally distributed, we also employ IV Poisson regressions to account for the discrete nature of our dependent variable (our financial knowledge score is an integer between 0 and 8). As discussed earlier, the international student dummy can be used as an instrument as our financial experience indices contain KiwiSaver and Student Loans, both of which are not available to international students. This instrument allows us to isolate the effect of experience on knowledge. We control for other potential influences on financial literacy by including age, gender and ethnicity dummies and creating indices out of parents' education and previous studies. Specifically, we define Parents' Ed as 0 if they did not complete high school, 1 if they did complete high school, 2 if they have a Trade Certificate or Diploma, 3 if they have a Bachelor's degree and 4 if they have a degree higher than a Bachelor's degree. We define Previous Ed as the sum of the dummies for the four high school subjects we examine, Accounting, Business Studies, Economics and Mathematics.

Table 6 presents the multivariate results for our IV and IV Poisson models.² The first stage of the IV regression treats Financial Experience as the dependent. When we examine this in a multivariate setting, we observe that there is a strongly significant relationship with our instrument, International, for both financial experience indices. We also see that the R^2 in both models are relatively high, 21% and 35%, respectively, suggesting that our choice of instrument is valid. Age appears to be the only control that is consistently significant, where the negative sign indicates that older respondents have lower experience (which confirms the findings in Table 5).

The results for the second stage of the IV and the IV Poisson are both supportive of the hypothesis that financial experience has a significant causal effect on financial knowledge. In all four models, we observe a significant positive coefficient indicating that those with a higher financial experience score have higher knowledge. With regards to the controls, we observe that Age has a significant positive coefficient suggesting older respondents had higher knowledge. This is supportive of the findings in most surveys which show that young adults and those in their retirement years have the least knowledge. We also observe a weak positive relationship between Financial Knowledge and Gender supporting other surveys and our earlier findings in Table 2 that male respondents have better financial understanding.

V. Conclusion

In this paper, we assess the causal effect of financial experience on financial knowledge. Exploiting a unique feature of New Zealand, which only allows domestic students to obtain interest free student loans and to participate in the national retirement scheme, KiwiSaver, we employ an instrumental variables approach to identify the causal effect of financial experience on financial knowledge. Using survey data on a sample of 338 first year business students, we find that there is a positive and causal effect of financial experience on financial knowledge. Our results therefore suggest that financial education programs may be more successful when containing experiential components.

²A Hausman test confirms that there is indeed an endogeneity issue and hence OLS will provide biased coefficients.

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APPENDIX 1 – THE SURVEY

Instructions for Completion

By completing this survey you are indicating your consent to participate in this research, and we thank you for your participation. We encourage you to answer all questions, however you can choose not to answer questions. All efforts will be made to ensure that no participant is identified in the research, therefore we ask you do not put your name, student id, or any other identifying information on the questionnaire.

Survey Questions

1. John inherits \$10,000 today and Elizabeth inherits \$10,000 6 months from now, whose inheritance is worth more?

- | | |
|--|--------------------------------------|
| <input type="checkbox"/> They are equally rich | <input type="checkbox"/> Elizabeth's |
| <input type="checkbox"/> John's | <input type="checkbox"/> Do not know |

2. Suppose you have \$100 in a savings account and the interest rate is 20% per year for the next five years. You never withdraw any money or interest. After 5 years, how much would you have in this account in total?

- | | |
|--|--|
| <input type="checkbox"/> Exactly \$200 | <input type="checkbox"/> More than \$200 |
| <input type="checkbox"/> Less than \$200 | <input type="checkbox"/> Do not know |

3. When a person invests money among different types of financial assets, such as stocks and bonds, the risk of losing money

- | | |
|------------------------------------|---|
| <input type="checkbox"/> Increases | <input type="checkbox"/> Stays the same |
| <input type="checkbox"/> Decreases | <input type="checkbox"/> Do not know |

4. Imagine that the interest rate on your saving account was 2% per year and inflation was 3% per year. After 1 year, how much would you be able to buy with the money in this account?

- | | |
|--|--|
| <input type="checkbox"/> More than today | <input type="checkbox"/> Less than today |
| <input type="checkbox"/> The same amount | <input type="checkbox"/> Do not know |

5. In general, which of the following is more risky: Bonds or Stocks?

- | | |
|---|--------------------------------------|
| <input type="checkbox"/> Stocks | <input type="checkbox"/> Bonds |
| <input type="checkbox"/> They are equally risky | <input type="checkbox"/> Do not know |

6. The Reserve Bank has just announced an unexpected cut in the interest rate of .5%. Which of the following reactions is most likely for the NZ/US exchange rate?

- The NZ \$ will increase
 The NZ \$ will not changed

- The NZ \$ will decrease
 Do not know

7. Scott and Eric are young men. Each has a good credit history. They work at the same company and earn the same salary. Scott has borrowed \$6,000 to take a vacation overseas. Eric has borrowed \$6,000 to buy a car. Who is most likely to pay the lowest interest rate on the loan?

- Both pay the same
 Scott

- Eric
 Do not know

8. If each of the following had the same amount of take-home salary, who would need the greatest amount of life insurance?

- An elderly retired man with a wife who is also retired
 A young married man without children
 A young single woman with two children
 A young single woman without children
 Do not know

9. Do you save money on a regular basis?

- Yes No

10. Do you currently have a credit card?

- Yes No

11. Do you pay off your credit card in full each month? (only answer if you answered yes to Q10.)

- Yes No

12. Have you ever had any of the following? (tick as many boxes as are appropriate)

- A hire purchase arrangement
 A personal loan from a bank or other lender
 A student loan

13. Do you invest in any of the following?

- Term Deposit
 Stocks
 Bonds
 Managed investment fund
 KiwiSaver

14. Age (in years)

15. Gender Male Female

16. Are you an international student? Yes No

17. What is the highest level of schooling completed by your parents?

- | | |
|---|---|
| <input type="checkbox"/> High school | <input type="checkbox"/> Trade certificate or diploma |
| <input type="checkbox"/> Bachelor degree | <input type="checkbox"/> Masters degree or higher |
| <input type="checkbox"/> Did not complete high school | |

18. What is your ethnicity? (Select as many as are required)

- | | | |
|--------------------------------------|---------------------------------|---|
| <input type="checkbox"/> European | <input type="checkbox"/> Maori | <input type="checkbox"/> Pacific Islander |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Indian | <input type="checkbox"/> Middle Eastern |
| <input type="checkbox"/> Other Asian | <input type="checkbox"/> Other | |

19. Which of the following subjects did you take at high school? (Only tick those that apply otherwise leave blank)

- | | |
|---|---|
| <input type="checkbox"/> Accounting | <input type="checkbox"/> Economics |
| <input type="checkbox"/> Business Studies | <input type="checkbox"/> Mathematics and Statistics |

Table 1: Summary Statistics

Panel A: Demographic Information			
<i>Age</i>			
	<i>18-24</i>	288	85.2%
	<i>24+</i>	50	14.8%
<i>Gender</i>			
	<i>Male</i>	171	50.7%
	<i>Female</i>	166	49.3%
<i>Ethnicity</i>			
	<i>European</i>	98	29.0%
	<i>Maori and PI</i>	49	14.5%
	<i>Asian</i>	139	41.1%
	<i>Indian and ME</i>	42	12.4%
	<i>Other</i>	25	7.4%
<i>Parents</i>			
	<i>No High School</i>	14	4.1%
	<i>High School</i>	133	39.3%
	<i>Trade Cert/Diploma</i>	60	17.8%
	<i>Bachelors</i>	93	27.5%
	<i>Post Graduate</i>	47	13.9%
<i>High School Studies</i>			
	<i>Accounting</i>	105	31.1%
	<i>Business Studies</i>	91	26.9%
	<i>Economics</i>	135	39.9%
	<i>Mathematics</i>	227	67.2%
Panel B: Financial Experience			
<i>Assets</i>			
	<i>Savings</i>	223	66.2%
	<i>Term Deposit</i>	71	21.0%
	<i>Stocks</i>	23	6.8%
	<i>Bonds</i>	18	5.3%
	<i>Mutual Funds</i>	14	4.1%
	<i>KiwiSaver</i>	130	38.5%
<i>Liabilities</i>			
	<i>Credit Card</i>	143	42.3%
	<i>Repay Monthly</i>	89	61.8%
	<i>Hire Purchase</i>	52	15.4%
	<i>Personal Loan</i>	61	18.0%
	<i>Student Loan</i>	215	63.6%

Table 2: Overall Financial Knowledge Results

Panel A: Financial Knowledge by Demographics			Difference
<i>Age</i>			
	<i>18-24</i>	3.93	
	<i>24+</i>	4.22	-0.29
<i>Gender</i>			
	<i>Male</i>	4.18	
	<i>Female</i>	3.73	0.45***
<i>Ethnicity</i>			
	<i>European</i>	4.37	0.56***
	<i>Maori and PI</i>	3.71	-0.30
	<i>Asian</i>	3.97	0.00
	<i>Indian and ME</i>	3.36	-0.70**
	<i>Other</i>	3.64	-0.36
<i>Parents</i>			
	<i>No High School</i>	4.14	0.18
	<i>High School</i>	3.91	-0.10
	<i>Trade Cert/Diploma</i>	4.10	0.16
	<i>Bachelors</i>	4.01	0.06
	<i>Post Graduate</i>	3.94	-0.04
<i>High School Studies</i>			
	<i>Accounting</i>	3.91	-0.08
	<i>Business Studies</i>	4.00	0.04
	<i>Economics</i>	4.09	0.20
	<i>Mathematics</i>	4.00	0.09
Panel B: Financial Knowledge by Financial Experience			
<i>Assets</i>			
	<i>Savings</i>	3.98	0.00
	<i>Term Deposit</i>	4.14	0.22
	<i>Stocks</i>	4.61	0.68*
	<i>Bonds</i>	4.00	0.03
	<i>Mutual Funds</i>	4.50	0.55
	<i>KiwiSaver</i>	4.12	0.25*
<i>Liabilities</i>			
	<i>Credit Card</i>	3.84	-0.23*
	<i>Repay Monthly</i>	3.88	-0.13
	<i>Hire Purchase</i>	3.87	-0.12
	<i>Personal Loan</i>	4.28	0.38*
	<i>Student Loan</i>	4.04	0.20

Note: Difference is calculated as the difference in mean of those in a category against all other respondents. Significance is calculated using a t-test. Financial Knowledge is calculated as the sum of the correct responses to the eight financial understanding questions. *** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 3: Percentage Correct Responses by Demographic Information

	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8
<i>Age</i>								
18-24	44.4%	75.7%	28.5%*	66.0%	63.2%	40.3%	27.8%	46.9%
24+	50.0%	68.0%	42.0%*	66.0%	74.0%	48.0%	30.0%	44.0%
<i>Gender</i>								
Male	45.6%	77.2%	30.4%	70.8%*	68.4%	43.9%	31.6%	50.3%
Female	44.6%	71.7%	30.1%	60.8%*	61.4%	38.6%	24.1%	42.2%
<i>Ethnicity</i>								
European	54.1%**	79.6%	29.6%	78.6%***	71.4%	40.8%	30.6%	52.0%
Maori and PI	51.0%	61.2%**	26.5%	61.2%	55.1%	32.7%	32.7%	51.0%
Asian	38.1%**	79.9%*	32.4%	67.6%	63.3%	46.0%	25.2%	44.6%
Indian and ME	40.5%	57.1%***	31.0%	50.0%**	66.7%	33.3%	26.2%	31.0%**
Other	44.0%	52.0%***	28.0%	56.0%	68.0%	36.0%	28.0%	52.0%
<i>Parents</i>								
No High School	50.0%	85.7%	21.4%	71.4%	42.9%*	50.0%	35.7%	57.1%
High School Trade	44.4%	73.7%	30.1%	69.9%	68.4%	42.9%	22.6%	39.1%*
Cert/Diploma	55.0%*	76.7%	25.0%	65.0%	68.3%	40.0%	33.3%	46.7%
Bachelors	46.2%	74.2%	37.6%*	61.3%	61.3%	32.3%*	33.3%	54.8%
Post Graduate	46.8%	68.1%	31.9%	66.0%	63.8%	38.3%	25.5%	53.2%
<i>Previous Ed</i>								
Accounting Business Studies	45.7%	75.2%	27.6%	65.7%	61.9%	44.8%	23.8%	46.7%
Economics	57.1%***	70.3%	34.1%	67.0%	58.2%	36.3%	34.1%	42.9%
Mathematics	45.9%	71.1%	34.1%	68.9%	60.7%	45.2%	33.3%	49.6%
	45.8%	74.0%	31.3%	69.6%**	64.8%	41.0%	27.8%	45.8%

Note: Significance is measured as the percentage of correct responses for those with a particular characteristic versus all other respondents. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

Table 4: Percentage Correct Responses by Financial Experience

	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8
<i>Assets</i>								
<i>Savings</i>	44.4%	75.3%	30.9%	66.4%	63.2%	45.7%	27.8%	43.9%
<i>Term Deposit</i>	45.1%	85.9% **	35.2%	73.2%	60.6%	45.1%	23.9%	45.1%
<i>Stocks</i>	60.9%	73.9%	26.1%	73.9%	82.6% *	52.2%	26.1%	65.2% *
<i>Bonds</i>	33.3%	72.2%	27.8%	61.1%	72.2%	77.8% ***	16.7%	38.9%
<i>Mutual Funds</i>	64.3%	78.6%	28.6%	57.1%	85.7%	42.9%	50.0% *	42.9%
<i>KiwiSaver</i>	50.0%	74.6%	28.5%	73.8% *	68.5%	39.2%	27.7%	50.0%
<i>Liabilities</i>								
<i>Credit Card</i>	39.9% *	72.0%	28.7%	67.1%	65.0%	40.6%	28.0%	42.7%
<i>Repay Monthly</i>	41.6%	76.4%	29.2%	67.4%	64.0%	40.4%	25.8%	42.7%
<i>Hire Purchase</i>	46.2%	67.3%	26.9%	69.2%	69.2%	30.8%	25.0%	51.9%
<i>Personal Loan</i>	54.1%	70.5%	34.4%	68.9%	68.9%	52.5% *	29.5%	49.2%
<i>Student Loan</i>	48.4%	73.0%	29.8%	68.4%	66.5%	41.9%	29.8%	46.5%

Note: Significance is measured as the percentage of correct responses for those with a particular characteristic versus all other respondents. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

Table 5: Financial Experience and Demographics

		Financial Experience 1	Difference	Financial Experience 2	Difference
<i>Age</i>					
	<i>18-24</i>	1.41		1.39	
	<i>24+</i>	.70	-0.71***	1.04	-0.35**
<i>Gender</i>					
	<i>Male</i>	1.40		1.43	
	<i>Female</i>	1.21	-0.19	1.24	-0.20*
<i>Ethnicity</i>					
	<i>European</i>	1.78	0.67***	1.85	0.71***
	<i>Maori and PI</i>	1.37	0.08	1.65	0.36**
	<i>Asian</i>	.92	-0.65***	.84	-0.83***
	<i>Indian and ME</i>	1.38	0.09	1.5	0.18
	<i>Other</i>	1.36	0.06	1.56	0.24
<i>Parents</i>					
	<i>No High School</i>	1.64	0.36	1.64	0.32*
	<i>High School</i>	1.40	0.17	1.44	0.17
	<i>Trade Cert/Diploma</i>	1.23	-0.08	1.45	0.13
	<i>Bachelors</i>	1.30	0.07	1.22	-0.16
	<i>Post Graduate</i>	1.30	-0.01	1.36	0.02
<i>High School Studies</i>					
	<i>Accounting</i>	1.30	0	1.36	0.03
	<i>Business Studies</i>	1.54	0.32***	1.57	.32**
	<i>Economics</i>	1.36	0.10	1.39	0.07
	<i>Mathematics</i>	1.36	0.18	1.40	0.18

Note: Difference is calculated as the difference in mean of those in a category against all other respondents. Financial Experience 1 is calculated as the sum of the financial assets respondents had experience with plus student loans, less financial liabilities. Financial Experience 2 was calculated as the sum of savings plus investments plus kiwisaver and student loans less debt. Savings was defined as 1 if the respondent either saved regularly or had experience of Term Deposits. Investments equalled 1 if the respondent had experience of stocks, bonds or mutual funds. Debt equalled 1 if the respondent had experience of personal loans, credit cards or hire purchases. Significance was calculated using a t-test. *** Significant at 1%, ** Significant at 5%, * Significant at 10%

Table 6: IV and IV Poisson Regression Coefficients

	Financial Experience Index 1			Financial Experience Index 2		
	IV		IV Poisson	IV		IV Poisson
	1 st Stage	2 nd Stage		1 st Stage	2 nd Stage	
<i>Constant</i>	3.9144*** (0.4833)	0.7525 (1.081)	0.4620 (0.322)	3.0674*** (0.3778)	1.4573* (0.818)	0.7200*** (0.200)
<i>Fin_Experience</i>		0.5452** (0.239)	0.1692** (0.076)		0.4613** (0.191)	0.1352** (0.056)
<i>International</i>	-0.9823*** (0.1700)			-1.1901*** (0.1327)		
<i>Age</i>	-0.0873*** (0.0168)	0.0966*** (0.031)	0.0269*** (0.009)	-0.0538*** (0.0962)	0.0738*** (0.025)	0.0186*** (0.006)
<i>Gender</i>	0.0809 (0.1232)	0.2905* (0.172)	0.0659 (0.048)	0.0776 (0.0962)	0.3064* (0.166)	0.0779* (0.044)
<i>European</i>	-0.1431 (0.2540)	0.3525 (0.349)	0.1041 (0.093)	0.0142 (0.1986)	0.2677 (0.340)	0.0669 (0.074)
<i>Maori and Pacific</i>	-0.4122* (0.2374)	-0.2887 (0.331)	-0.0312 (0.101)	-0.1265 (0.1856)	-0.4547 (0.316)	-0.1020 (0.075)
<i>Asian</i>	-0.4769* (0.2743)	0.4687 (0.421)	0.1558 (0.121)	-0.3268 (0.2145)	0.3583 (0.387)	0.1029 (0.087)
<i>Indian</i>	-0.3627 (0.2947)	-0.5111 (0.416)	-0.1183 (0.113)	-0.1255 (0.2306)	-0.6493 (0.395)	-0.1719* (0.093)
<i>Other</i>	-0.3380 (0.3007)	-0.2584 (0.419)	-0.0468 (0.126)	-0.1117 (0.2351)	-0.3909 (0.402)	-0.1043 (0.107)
<i>Parents Ed</i>	-0.0475 (0.0461)	-0.0114 (0.064)	-0.0037 (0.018)	-0.0278 (0.0360)	-0.0206 (0.061)	-0.0071 (0.016)
<i>Previous Ed</i>	-0.0347 (0.0550)	0.1044 (0.076)	0.0205 (0.022)	-0.0375 (0.0430)	0.1042 (0.073)	0.0218 (0.020)
<i>Observations</i>	329	329	329	330	330	330
<i>R²</i>	0.2147	0.0143		0.3514	0.0744	

Note: Instrumental variables employed international students dummy as the instrument. Financial Experience 1 is calculated as the sum of the financial assets respondents had experience with plus student loans, less financial liabilities. Financial Experience 2 was calculated as the sum of savings plus investments plus kiwisaver and student loans less debt. Savings was defined as 1 if the respondent either saved regularly or had experience of Term Deposits. Investments equalled 1 if the respondent had experience of stocks, bonds or mutual funds. Debt equalled 1 if the respondent had experience of personal loans, credit cards or hire purchases. Significance was calculated using a t-test. *** Significant at 1%, ** Significant at 5%, * Significant at 10%

Figure 1: The Use of Instrumental Variables

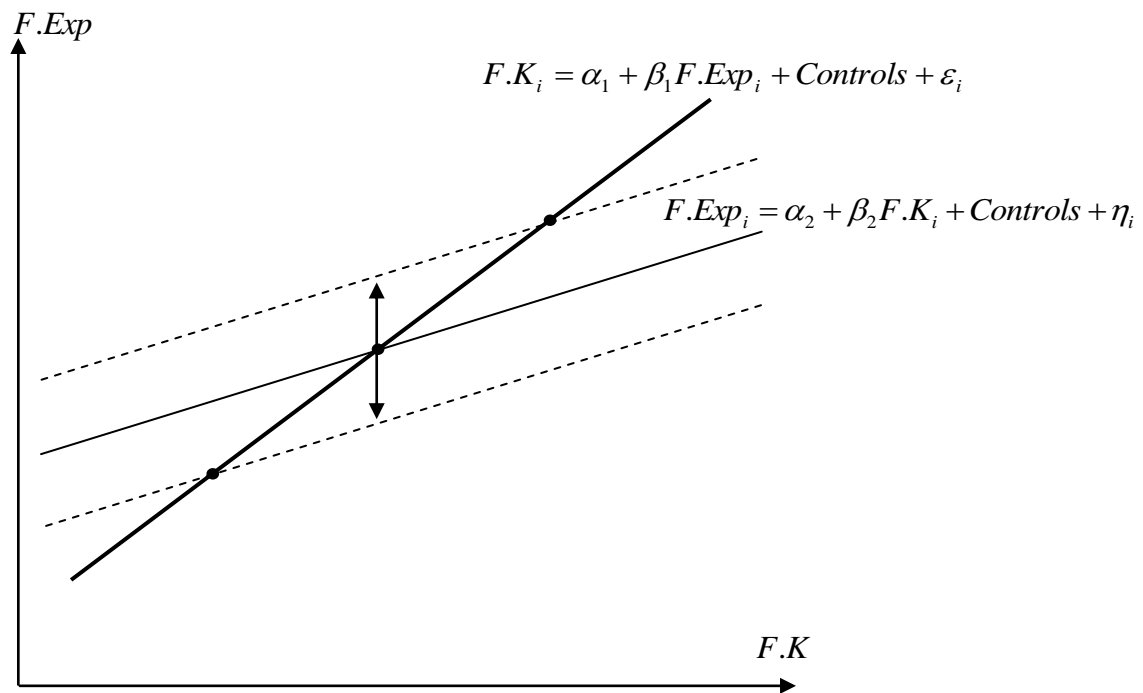


Figure 2: Percentage of Respondents by Financial Literacy Score

