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Financial Literacy and Wealth Accumulation: Evidence from Japan

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Abstract

Using data on Japanese households, I analyzed the relationship between financial literacy and wealth accumulation. Taking account of endogeneity problems of financial literacy, I found that financial literacy increases the amount of wealth, and the magnitude of the impact is sizeable.

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1. Introduction

Dispersion in wealth accumulation has been explained by many factors, including lifetime earnings, the willingness to leave bequests, motives for precautionary and other savings, and cross-sectional differences in time preferences. The impact of financial literacy (FL) on wealth accumulation has received much less attention, mainly because of a lack of data on financial knowledge levels.

Recently, however, Behrman, Mitchell, Soo, and Bravo (2010) and Van Rooij, Lusardi, and Alessie (2012) have studied the relationship between FL and household wealth, using data on Chilean and Dutch households, respectively. They find evidence that FL has a positive impact on wealth accumulation. This paper complements these previous papers by using data on Japanese households and analyzing the relationship between FL and wealth accumulation.

Investigating the relationship between FL and wealth accumulation is especially important in Japan because, under the pay-as-you-go pension systems that are vulnerable to the aging population, Japan's population has been aging rapidly, meaning that individuals would need to take on more responsibility for their financial well-being after retirement. If it is confirmed that FL has a positive effect on wealth accumulation, policymakers should promote more financial education programs in schools and workplaces.

The contributions of this paper are the following. First, to address the problem of causality between FL and wealth accumulation, I use levels of Japanese and mathematical skills as instruments for FL; respondents with higher Japanese and mathematical skills are more likely to comprehend the FL questions than those with lower Japanese and mathematical skills, and it is unlikely that Japanese and mathematical skills would affect wealth accumulation directly. Second, I examine the effect of savings promotion activities in schools (referred to as "children's banks") on wealth accumulation. Although children's banks are considered to be the earliest financial education in Japan, as far as I know, an analysis of the relationship between children's banks and wealth accumulation has never been conducted.[1]

This paper is organized as follows. Section 2 reviews the previous studies on the relationship between FL and wealth accumulation. Section 3 presents data and descriptive statistics, explains how measures of wealth and FL are constructed, and looks at the bivariate relationship between FL and wealth. Section 4 shows the results of a multivariate regression of wealth on FL and many other explanatory variables. Section 5

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[1] Sekita (2011) found that FL increases the probability of having a retirement savings plan using the same data as used in this paper.

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provides concluding remarks.

2. Previous Studies

Bernheim (1995) is the first paper to point out the importance of FL in explaining savings and differences in saving behavior. Since then, there has been a considerable amount of research on the measurement of FL and its effects on household behavior (for example, Banks, O'Dea, and Oldfield, 2010; Christelis, Jappelli, and Padula, 2010; Smith, McArdle, and Willis, 2010; Van Rooij, Lusardi, and Alessie, 2011).

The previous studies that are most relevant to this paper are Behrman et al. (2010) and Van Rooij et al. (2012). Behrman et al. (2010) is the first paper to estimate the impact of FL on wealth, using IV methods.[2] They find that FL has large positive effects on household wealth accumulation. Van Rooij et al. (2012) not only find that FL has a positive impact on wealth accumulation using IV methods[3] but also highlight two possible channels through which FL might facilitate wealth accumulation. The first channel is via stock market participation. A high level of FL lowers the costs of gathering and processing information and reduces barriers to investing in the stock market (Haliassos and Bertaut, 1995). Therefore, individuals with high FL are more likely to hold stocks and have an opportunity to exploit the risk premium on equity investments than are those with low FL, which may contribute to the positive effect of FL on wealth accumulation. The second channel is via retirement savings plans. Ameriks, Caplin, and Leahy (2003) note that if consumers want to save, but simply lack the discipline to do so, planning may help these consumers to control their consumption. However, developing a savings plan is a complex task because one needs to collect and process a great deal of information including on investment returns and pensions benefits (Lusardi and Mitchell, 2007). Thus, individuals with a higher level of FL are better able to develop savings plans, which may contribute to a higher level of wealth accumulation.

However, there are some counterarguments in relation to the two channels explained above. First, with respect to the relationship between FL and stock holdings, individuals with a low level of FL might decide to hold stocks without thinking deeply about potential risks, whereas those with a high level of FL may be more cautious and decide not to hold stocks. In addition, with respect to the relationship between having a savings plan and wealth accumulation, if individuals cannot calculate how much they should save for retirement and cannot develop a savings plan, they might feel more

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[2] They use the data on Chilean households from the Social Protection Survey (Encuesta de Protección Social, EPS) conducted in 2006.

[3] They use panel data on Dutch households from the annual De Nederlandsche Bank (DNB) Household Survey (DHS) conducted from September 23 to September 27, 2005.

anxious about retirement and might accumulate more wealth rather than those who can develop a savings plan. Therefore, it is ambiguous whether FL increases wealth accumulation *a priori*.

3. Data

This paper uses the data from the Survey of Living Preferences and Satisfaction[4] (SLPS), which is a panel survey that has been conducted annually since 2003.[5] It is a nationally representative sample of males and females aged 20–69 years, selected by a two-stage stratified random sampling from household registers. This paper employs data from the January–February 2010 wave (the eighth wave of the survey) because it is the first wave to include questions designed to measure the respondents' levels of FL. There were 5,386 respondents in the 2010 SLPS, and the response rate was 88%.[6] To select the final sample, I dropped observations that had missing values for the variables included in the regression and observations for which the respondents are students because students are supposed to answer the amount of wealth based on the assets of their parents' entire household. Moreover, because the wealth regression might be sensitive to outliers, I trimmed the total net wealth variable by excluding the top and bottom 1% of the total net wealth distribution. As a result, the final sample consists of 2,726 households.[7]

In the final sample, the average age of respondents is 45, 53% of respondents are men, 76% are married, 17% are retired, and 32% completed junior college or university (see Table 1 for the definition and mean of explanatory variables in the wealth regressions).

3.1 Wealth

In this subsection, I explain how the measure of wealth is defined using the following four questions and show the mean, median, and standard deviation of wealth.

Financial Assets Question

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[4] In Japanese: *Kurashi no Konomi to Manzokudo Chosa*.

[5] The SLPS has been conducted by Osaka University's 21st Century Center of Excellence (COE) program, Behavioral Macrodynamics Based on Surveys and Experiments since 2003 and by Osaka University's Global COE program, Human Behavior and Socioeconomic Dynamics since 2009. Osaka University's COE program subcontracts the administration of the surveys to Chuo Chosa-sha. The questionnaire is in paper and pencil format, and participants in SLPS 2010 received gift certificates for 1,500 yen.

[6] Osaka University's Global COE program sends questionnaires to individuals who responded to the survey in the previous year, which may be why the response rate is so high.

[7] I use sampling weights to calculate all statistics to ensure representativeness of the population hereafter.

Approximately how much is the balance of financial assets (savings, stocks, and insurance, etc.) of your entire household? (i) Less than 2,500,000 yen; (ii) 2,500,000 yen to less than 5,000,000 yen; (iii) 5,000,000 yen to less than 7,500,000 yen; (iv) 7,500,000 yen to less than 10,000,000 yen; (v) 10,000,000 yen to less than 15,000,000 yen; (vi) 15,000,000 yen to less than 20,000,000 yen; (vii) 20,000,000 yen to less than 30,000,000 yen; (viii) 30,000,000 yen to less than 50,000,000 yen; (ix) 50,000,000 yen to less than 100,000,000 yen; (x) 100,000,000 yen or more.

Real Assets Question

Approximately how much is the present appraised value of all housing and properties owned by your entire household? (i) No housing or properties possessed; (ii) Less than 5,000,000 yen; (iii) 5,000,000 yen to less than 10,000,000 yen; (iv) 10,000,000 yen to less than 15,000,000 yen; (v) 15,000,000 yen to less than 20,000,000 yen; (vi) 20,000,000 yen to less than 30,000,000 yen; (vii) 30,000,000 yen to less than 40,000,000 yen; (viii) 40,000,000 yen to less than 50,000,000 yen; (ix) 50,000,000 yen to less than 100,000,000 yen; (x) 100,000,000 yen or more.

Financial Loans Question

Do you have any liabilities or debts other than housing loans? (i) No loans other than mortgage loans; (ii) 10,000 yen to less than 500,000 yen; (iii) 500,000 yen to less than 1,000,000 yen; (iv) 1,000,000 yen to less than 2,000,000 yen; (v) 2,000,000 yen to less than 3,000,000 yen; (vi) 3,000,000 yen to less than 5,000,000 yen; (vii) 5,000,000 yen to less than 7,500,000 yen; (viii) 7,500,000 yen to less than 10,000,000 yen; (ix) 10,000,000 yen or more.

Housing Loans Question

If you have housing loans, what is the current balance of your housing loans? (i) Less than 2,500,000 yen; (ii) 2,500,000 yen to less than 5,000,000 yen; (iii) 5,000,000 yen to less than 7,500,000 yen; (iv) 7,500,000 yen to less than 10,000,000 yen; (v) 10,000,000 yen to less than 15,000,000 yen; (vi) 15,000,000 yen to less than 20,000,000 yen; (vii) 20,000,000 yen to less than 30,000,000 yen; (viii) 30,000,000 yen or more; (ix) No mortgage loans.

In this paper, the measure of "net financial assets" is the amount of financial assets minus the amount of financial loans, "net real assets" is the amount of real assets minus the amount of housing loans, and "total net wealth" is the sum of "net financial assets"

and "net real assets".[8] Table 2 reports the mean, median, and standard deviation of each wealth variable and shows that considerable variance exists across households.

3.2 Financial Literacy

In this section, I present the four questions used to construct the measure of FL, show the level of FL of Japanese households, including how it varies across demographics, and explain how to construct the measure of FL used in the estimation. The wording of the four questions is as follows.

Numeracy

"Suppose you had 10,000 yen in a savings account and the interest rate was 2% per year. After five years, how much do you think you would have in the account if you left the money to grow?"

(i) More than 10,200 yen; (ii) Exactly 10,200 yen; (iii) Less than 10,200 yen;

(iv) Do not know; (v) Refuse to answer.

Inflation

"Suppose that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, what would you be able to buy with the money in this account?"

(i) More than today; (ii) Exactly the same; (iii) Less than today;

(iv) Do not know; (v) Refuse to answer.

Risk Diversification

"Do you think that the following statement is true? Buying a single company stock usually provides a safer return than a stock mutual fund."

(i) True; (ii) False; (iii) Do not know; (iv) Refuse to answer.

Bond Price

"If the interest rate falls, what should happen to bond prices?"

(i) Rise; (ii) Fall; (iii) Stay the same; (iv) None of the above; (v) Do not know; (vi) Refuse to answer.

Respondents' answers to the four questions are reported in Table 3(a).[9] With

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[8] For example, if respondents chose (ii) 2,500,000 yen to less than 5,000,000 yen in the financial assets question, the amount of financial assets is defined as the middle value, 3,750,000 yen. On the other hand, if respondents chose (x) 100,000,000 yen or more, the amount of financial assets is defined as 125,000,000 (=100,000,000*1.25) yen.

[9] I drop the observations for which the answers to the FL questions are missing (1.4–1.9% of the total observations) or respondents who choose "Refuse to answer" (1.3–1.8% of the total observations).

respect to the *Numeracy* question, about 76% of respondents correctly answered. As this question is very basic, it seems that most respondents easily provided the correct answer. On the other hand, only 61% of respondents correctly answered the *Inflation* question. The proportion of respondents who did not know the answer to this question was about 28%, close to three times the proportion of respondents who did not know the answer to the *Numeracy* question (10%). With respect to the *Risk diversification* question, the proportion of respondents who gave the correct answer (44%) was lower than that of respondents who did not know the answer (54%). In the *Bond price* question, only 13% of respondents gave the correct answer, and most respondents answered incorrectly or did not know the answer. Therefore, many people are not fully equipped with financial knowledge, and FL should not be taken for granted.

Next, I focus on respondents who display lower levels of FL. Table 3(b) shows the relationship between FL and demographic characteristics.

Age: The percentage of respondents who correctly answered all of the FL questions, except for the *Bond price* question, and the mean of the number of correct answers increase with age, implying that young respondents are more financially illiterate than older respondents.

Gender: Women are less likely to answer all questions correctly than men, and the mean of the number of correct answers for women is lower than for men.

Education: FL is highly correlated with education and the gradient is steep. As the level of education increases, the percentage of respondents with correct answers to individual questions and the mean of the number of correct answers are higher.

Major: As expected, respondents who majored in economics in junior college or university are more likely to give correct answers to the FL questions than those who majored in other subjects.[10]

Subjective financial literacy: It is possible to examine the relationship between subjective and objective levels of FL because respondents are asked whether they think they know a lot about finance, and rank their answer on a 1−5 scale. As can be seen from Table 3(b), as the subjective level of FL increases, the percentage of respondents with correct answers to individual questions and the mean of the number of correct answers are higher. However, even among respondents with the highest subjective level of FL, the percentage of correct answers to the *Bond price* question is only 53%.

The simplest measure of FL is the number of correct answers to the four FL questions. However, as this approach has the disadvantage of weighting each question equally regardless of the difficulty, I construct a FL score using a weighted scoring

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[10] The data on majors in junior college or university are collected from the SLPS 2011.

mechanism called PRIDIT, which was also used by Behrman et al. (2010) to construct their FL score (see Brockett, Derrig, Golden, Levine, and Alpert (2002) and Lieberthal (2008) for details on how to calculate the PRIDIT score). This approach involves a two-step weighting scheme.

In the first step, respondents are provided with a reward (positive score) or a penalty (negative score) for each question. If respondents provide the correct (incorrect) answer to the easy question, they obtain a small reward (large penalty). On the other hand, if respondents provide a correct (incorrect) answer to the difficult question, they obtain a large reward (small penalty). For example, if respondents provide the correct answer to the *Numeracy* question, they obtain a score of about 0.24 (=1–0.758), whereas if they provide an incorrect answer, or do not know the answer, they obtain a score of about –0.76.

In the second step, principal component analysis is applied and weights[11] are calculated. There are two criteria for the weights: 1) the less that questions are correlated with other questions, the more they tend to be informative and, thus, they are given a high weight; 2) if the percentage of respondents who correctly answered a question is closer to 50%, rather than almost zero or almost one, the question tends to be more informative, and thus the weights become high. The weights for the *Numeracy*, *Inflation*, *Risk diversification*, and *Bond price* questions are 0.67, 0.72, 0.69, and 0.49, respectively. The weight given to the *Bond price* question is the lowest among the four questions because the percentage of correct answers for this question is only 13%, although the bivariate correlations between the correct answers to the *Bond price* question and the other questions are relatively low, ranging from 0.13 (for the correlation between the *Bond price* question and *Numeracy* question) to 0.20 (for the correlation between the *Bond price* question and the *Risk diversification* question).

The mean, standard deviation, minimum, and maximum of the resulting score are 0.0012, 0.0014, –0.0224, and 0.0268, respectively. As expected, the score is highly correlated with the simple number of correct answers to the four questions, and the coefficient of correlation between the two is 0.9998. Nevertheless, hereafter, I use the score calculated by the PRIDIT approach because it takes account of the difficulty of each question and of which question is more informative.

3.3 Financial Literacy and Total Net Wealth

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[11] The weights are calculated using the first eigenvalue and the first eigenvector obtained by principal component analysis, and the calculated weights are used when the four scores calculated in the first step are summed together.

In this section, I examine the bivariate relationship between FL and net wealth. From Table 4, it is clear that the mean and median of total net wealth increase with the level of FL. The mean (median) of total net wealth in the top FL quartile amounts to about 30 million yen (20 million yen), which is 1.9 times the mean (2.7 times the median) of total net wealth in the bottom FL quartile.

4. Estimation

To examine the relationship between total net wealth, FL, and socioeconomic characteristics, in this section I conduct a multivariate analysis.

4.1 OLS Estimation

First, I estimate a simple linear probability model. The dependent variable is total net wealth and the explanatory variables are the FL score, the education level, children's banks (discussed below), confidence in financial knowledge, age, household income, gender, marital status, the number of children, retirees, the bequest motive, changes in income, self-employment, anxieties about health, risk aversion, impatience, carelessness, self-control, appetite for saving, city size, and the area in which the respondent lives (see Table 1 for the definitions of explanatory variables).

From Model 1 in Table 5, it can be seen that FL has a positive and significant effect on total net wealth, and the magnitude of the impact is sizeable. A one standard deviation increase in the score (equivalent to moving from the average level of FL to the 92nd percentile level) is associated with an increase in total net wealth of about 3 million yen (=242,827,618*0.0139), or a 15% (=336.7145/2,246) increase in the mean of total net wealth. Thus, respondents with higher FL are more likely to accumulate wealth.

Education levels also have a positive and significant effect on total net wealth. If respondents completed upper secondary school or junior college (university), their total net wealth is higher by about 9 million (16 million) yen than those who completed a level of schooling below upper secondary school.

Japan's school curricula, enacted in 1951, recommended the introduction of savings promotion activities in schools, which is captured through the variable *Children's banks*. There has been no statement about children's banks in the school curricula since 1958, but during the 1950s, the number of children's banks increased all over Japan. For example, the number of children's banks in July 1949 was 9,709, accounting for 22% of elementary schools, lower secondary schools, and upper secondary schools. In July 1957, the number of children's banks rose to 23,649, accounting for 53% of elementary schools, lower secondary schools, and upper secondary schools in Japan. In schools with

children's banks, students were advised by the schools to deposit money regularly—for example, twice a month—into financial institutions, via the school.[12] Thus, one could expect that this experience would lead to the development of strong savings habits and to the accumulation of more wealth by these respondents than by respondents whose schools did not have children's banks.[13] The question about children's banks is as follows.

 "Was there a children's bank (the system through which students could deposit and withdraw money via their school) in the elementary school that you attended?"
(i) Yes; (ii) No; (iii) Do not know.

I constructed the following two dummy variables: *Children's banks (Yes)* is a dummy variable that equals one if respondents' schools had children's banks; *Children's banks (Don't know)* is a dummy variable that equals one if respondents did not know if their schools had children's banks. Looking at Model 1 in Table 5, we see that the coefficient of *Children's banks (Yes)* is not significant, meaning that the savings activities that respondents engaged in when they were in elementary school do not affect their future wealth accumulation, contrary to my expectation.

Van Rooij et al. (2012) examine the effect of confidence in financial knowledge in relation to actual financial knowledge. For example, underconfident individuals might refrain from using new financial products, forego potential financial benefits, and accumulate low wealth. On the other hand, overconfident individuals might purchase financial products that they do not fully understand, make financial mistakes, and end up accumulating low wealth. Thus, the effect of confidence is ambiguous *a priori*.

Confidence in financial knowledge is measured as follows. First, in my survey, respondents are asked whether they think they know a lot about finance, and to give their answer on a 1–5 scale. Using this answer about subjective FL, I divide respondents into four groups. If respondents answer 1 (2, 3, or 4/5), they are classified into group 1 (2, 3, or 4). Next, I rank the respondents from the lowest PRIDIT score and divide them into four groups according to their PRIDIT score, so that the number of respondents in each group is close to that in each group classified by subjective FL. Then, I create the dummy

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[12] The interest income on the money deposited through children's banks is tax-exempt.

[13] In addition, there is a possibility that access to children's banks might improve financial literacy levels as it would offer experience with interest calculations and thinking about the value of money. However, I find that there is no significant difference in financial literacy between respondents whose schools had children's banks and those whose schools did not (see Model 2-1 in Table 5).

variable *Underconfidence* (*Overconfidence*), which equals one if the group ranking classified by subjective FL is lower (higher) than that classified by the PRIDIT score. Looking at Model 1 in Table 5, I find that underconfident (overconfident) respondents accumulate lower levels of wealth than those who correctly assess their level of FL, implying that, while overconfident individuals hold less conservative portfolios and can accumulate more wealth, underconfident individuals hold conservative portfolios, cannot obtain financial benefits, and end up accumulating lower wealth.[14]

4.2 GMM Estimation

In the OLS estimation, the positive relationship between FL and wealth accumulation is confirmed. However, I am cautious about endogeneity problems. For example, individuals with more wealth might acquire much more financial knowledge through investments to risky assets. As a result, the OLS coefficient of FL could be biased upwards (simultaneity). In addition, FL might be related to some unobserved variables that also affect wealth accumulation (omitted variables). For example, unobservable "ability" might have a positive effect not only on wealth but also on the level of FL. In that case, the OLS coefficient of FL could be biased upwards. Moreover, FL defined in this paper might be a noisy measure of the actual financial knowledge, and the coefficient of FL could be biased toward zero (measurement error). Van Rooij et al. (2011) provide evidence that a slight variation in the wording of some FL questions affects response patterns and explain that respondents may have a tendency to guess the answer to FL questions. Therefore, the direction of bias cannot be predicted.

To solve this endogeneity problem, I conduct IV method using respondent's Japanese and Mathematical skills as instrumental variables for FL. Their variables are based upon the answer to the following question.

"When you were 15 years old, where did your grades in Japanese (Mathematics) rank among others in your grade?"
(i) In lower rank; (ii) In somewhat lower rank; (iii) In the middle; (iv) In somewhat higher rank; (v) In higher rank

I create the dummy variable *Respondent's Japanese skill* (*Respondent's Mathematical skill*), which equals one if respondent chooses (iv) or (v). The result of first stage regression is shown in Model 2-1 of Table 5. As expected, both *Respondent's Japanese*

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[14] Van Rooij et al (2012) find that, while the coefficient of overconfidence is negative but insignificant, underconfidence has a significant negative impact on net worth.

skill and *Respondent's Mathematical skill* have significant and positive effects on FL. The F-value of the excluded instruments is 30.258. Stock, Wright, and Yogo (2002) suggest that the F statistic should exceed 10 for inference based on the 2SLS estimator to be reliable when there is one endogenous regressor. My instruments meet this rule. Moreover, the Hansen's J test does not show rejection of the over-idenifiying restrictions, which indicate that my instruments are valid.

Model 2-2 of Table 5 presents that even if taking account of endogeneity of FL, FL has a positive and significant effect on total net wealth, and the magnitude is greater than OLS estimates. A one standard deviation increase in the score (equivalent to moving from the average level of FL to the 92nd percentile level) is associated to about 8.6 million yen (=619270797*0.0139) increase in total net wealth, or about 38 percent (=860.7864/2,246) increase in the mean of total net wealth.

4.3 Robustness Checks

To investigate the robustness of my finding, first, I replaced the score of FL with the number of correct answers to FL questions and found that FL still has a significant and positive effect on total net wealth (Model 3 of Table 6). Next, since it is especially important for individuals who are not retired yet to investigate whether FL increases the amount of wealth, I kept the observations in which respondents are non-retirees and confirmed that FL still has a significant and positive effect on total net wealth (Model 4 of Table 6). In addition, I kept observations in which respondents are married and mainly decide savings and investments for their households and found that FL still has a significant and positive effect on total net wealth (Model 5 of Table 6). Finally, to check whether FL affects both the amount of financial and real assets, I used net financial assets (Model 6 of Table 6) and net real assets (Model 7 of Table 6) as dependent variables, respectively and found that FL has a significant and positive effect on financial assets, but not on real assets. This result is not so surprising because there is a possibility that respondents obtained real assets from their parents as bequests.

5. Concluding Remarks

Using data on Japanese households, I analyzed the relationship between financial literacy and wealth accumulation. Taking account of endogeneity problems of financial literacy, I found that consistent with the results in previous studies, financial literacy increases the amount of wealth, and the magnitude of the impact is sizeable.

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Table 1: Definition and Mean of Explanatory Variables in Wealth Regression

Variables	Definition	Mean
Less than upper secondary school	Respondent completed school less than upper secondary school (dummy)	0.0573
Upper secondary school	Respondent completed upper secondary school (dummy)	0.4655
Junior college	Respondent completed junior college (dummy)	0.1588
University	Respondent completed university (dummy)	0.3184
Children's banks (Yes)	Respondent's elementary school had children's bank (dummy)	0.1215
Children's banks (No)	Respondent's elementary school had no children's bank (dummy)	0.7714
Children's banks (Don't know)	Respondent does not know if elementary school had children's bank (dummy)	0.1071
Underconfidence	Respondent is underconfident in financial knowledge (dummy)	0.3429
Overconfidence	Respondent is overconfident in financial knowledge (dummy)	0.2894
Age20	Respondent is aged 20-29 (dummy)	0.1529
Age30	Respondent is aged 30-39 (dummy)	0.2511
Age40	Respondent is aged 40-49 (dummy)	0.2284
Age50	Respondent is aged 50-59 (dummy)	0.2029
Age60	Respondent is aged 60 or over (dummy)	0.1648
Log(inc)	Natural logarithm of the annual earned income before taxes and with bonuses included of respondent's entire household for 2009	6.3213
Male	Respondent is male (dummy)	0.5327
Married	Respondent is married (dummy)	0.7626
No. of children	Number of children	1.6206
Retired	Respondent is retired (dummy)	0.1711
Bequest	"I want to leave my children as much of my inheritance as possible" (0: It doesn't hold true at all for respondent, 4: It is particularly true for respondent) 0-4	1.9930
Changes in income	How much the annual earned gross income of respondent's entire household changed in 2009 as compared to 2008 (%)	-1.7331
Self-employed	Respondent is self-employed or family business employee in self-employed business (dummy)	0.1148
Unhealthy	"I have anxieties about my health" (0: It doesn't hold true at all for respondent, 4: It is particularly true for respondent) 0-4	2.0969
Risk-averse	Respondent is strongly risk averse (dummy)	0.3059
Impatient	Degree of impatience measured by the question where respondent chooses between receiving 10,000 yen today and receiving X yen in seven days (%)	774.0915
Careless	How high the probability of rain has to be before respondent takes an umbrella when respondent usually goes out (0-99%)	49.7334
Self-control	"If there is something that I want, I need to buy it" (0: It is particularly true for respondent, 4: It doesn't hold true at all for respondent) 0-4	2.2372
Appetites for saving	"Saving money is the objective of life" (0: It doesn't hold true at all for respondent, 4: It is particularly true for respondent) 0-4	1.3997

Note 1: In the estimation, city size dummies and area dummies are included as explanatory variables as well as variables shown above.

Note 2: Mean of variables are weighted.

Table 2: Summary Statistics of Household Wealth (10,000 yen)

	Mean	Median	S.D.
Total net wealth	2,246	1,250	3,091
Net financial assets	1,007	475	1,565
Net real assets	1,239	750	2,177

Note : Statistics are weighted.

Table 3(a): Responses to Financial Literacy Questions (%)

	Numeracy	Inflation	Risk diversification	Bond price
Correct	75.80	60.82	43.50	12.94
Incorrect	14.12	11.55	2.99	42.70
Don't know	10.08	27.62	53.50	44.36

Note : Percentages are weighted.

Table 3(b): Distribution of Correct Answers across Demographics

	Percentages of correct answers				Mean of no. of correct answers	No. of obs.
	Numeracy	Inflation	Risk diversification	Bond price		
Age						
20-29	68.70	46.83	35.61	11.70	1.63	159
30-39	71.73	48.88	34.88	14.07	1.70	508
40-49	80.70	64.95	48.37	11.70	2.06	701
50-59	77.08	70.07	47.52	11.36	2.06	691
60 or over	80.22	74.90	52.27	16.01	2.23	667
Gender						
Male	78.72	67.80	49.87	16.66	2.13	1378
Female	72.47	52.87	36.25	8.69	1.70	1348
Education						
Less than upper seconda	57.58	50.22	33.75	10.03	1.52	196
Upper secondary school	73.55	54.92	37.53	10.04	1.76	1338
Junior college	73.77	54.23	39.31	8.71	1.76	424
University	83.38	74.66	56.09	19.81	2.34	768
Major						
Economics	85.44	78.71	62.89	29.46	2.56	114
Others	81.78	69.83	51.55	17.11	2.20	800
Subjective financial literacy						
1 (low)	72.29	51.06	32.93	8.85	1.65	949
2	76.30	64.22	43.54	9.69	1.94	962
3	77.48	66.07	52.43	18.57	2.15	643
4	85.47	78.49	71.10	31.08	2.66	153
5 (high)	97.15	83.55	74.88	52.81	3.08	19

Note: Statistics are weighted.

Table 4: Financial Literacy and Total Net Wealth (10,000 yen)

	Total net wealth	
	Mean	Median
Financial literacy quartiles		
1 (low)	1,597	750
2	1,728	875
3	2,196	1,250
4 (high)	3,036	2,000

Note: Statistics are weighted.

Table 5: Financial Literacy and Total Net Wealth (OLS and GMM Estimation)

	Model 1	Model 2-1	Model 2-2
	Total Net Wealth	Financial Literacy (1st stage)	Total Net Wealth (2nd stage)
	OLS	OLS	GMM
Financial literacy	24,282.7618***		61,927.0797**
	(5,576.7466)		(30,450.1384)
Upper secondary school	931.9198***	0.0023**	829.5401***
	(178.5400)	(0.0011)	(203.5667)
Junior college	901.1501***	0.0021*	783.9670***
	(211.9353)	(0.0012)	(234.0505)
University	1,593.6249***	0.0047***	1,369.9178***
	(206.9682)	(0.0012)	(293.4841)
Children's banks (Yes)	17.4701	0.0003	-37.3245
	(148.2917)	(0.0006)	(148.9605)
Children's banks (Don't know)	28.1029	-0.0013*	99.6770
	(162.9023)	(0.0008)	(169.7879)
Underconfidence	-358.3132**	0.0121***	-814.3146**
	(164.3772)	(0.0006)	(397.9050)
Overconfidence	219.1363*	-0.0052***	411.4947**
	(127.5132)	(0.0006)	(204.2727)
Age30	404.9280**	0.0022**	317.5287
	(205.5677)	(0.0011)	(214.3369)
Age40	968.1932***	0.0043***	813.2593***
	(207.9686)	(0.0011)	(240.5869)
Age50	2,028.0975***	0.0048***	1,901.0548***
	(221.8102)	(0.0011)	(265.5091)
Age60	3,996.9232***	0.0067***	3,760.7998***
	(238.9349)	(0.0012)	(323.1827)
Log(inc)	1,376.5722***	0.0020***	1,295.7656***
	(106.5528)	(0.0004)	(131.1356)
Male	-483.0052***	0.0045***	-645.2736***
	(129.7177)	(0.0005)	(186.0731)
Married	-1,184.6709***	0.0001	-1,220.3324***
	(166.4435)	(0.0007)	(170.1511)
No. of children	-115.9086**	-0.0005**	-94.1334
	(55.2154)	(0.0003)	(59.5468)
Retired	565.2099***	0.0007	537.3327***
	(157.2329)	(0.0006)	(162.8658)

Bequest	282.4862***	-0.0001	296.5649***
	(58.3201)	(0.0002)	(58.9257)
Changes in income	-1.5621	-0.0001	3.0788
	(11.3600)	(0.0001)	(11.8042)
Self-employed	669.4797***	0.0004	687.0512***
	(174.8401)	(0.0006)	(177.4945)
Unhealthy	-145.1722***	-0.0001	-137.9195**
	(53.6612)	(0.0002)	(54.9896)
Risk-averse	-192.7916	0.0022***	-292.3405**
	(120.5119)	(0.0005)	(146.7888)
Impatient	-0.0381	-0.0000***	-0.0230
	(0.0336)	(0.0000)	(0.0381)
Careless	-3.8362	-0.0000***	-1.9139
	(3.0237)	(0.0000)	(3.3439)
Self-control	-20.2136	0.0004	-39.9139
	(50.1820)	(0.0002)	(51.9984)
Appetites for saving	34.2958	-0.0002	48.1594
	(66.3390)	(0.0003)	(67.1676)
Respondent's Japanese skill		0.0017***	
		(0.0005)	
Respondent's Mathematical skill		0.0031***	
		(0.0005)	
Constant	-7,511.6739***	-0.0229***	-6,713.6294***
	(683.2735)	(0.0035)	(979.0124)
No. of Obs.	2,726	2,687	2,687
R-squared	0.2949	0.4778	0.2827
F-value of the excluded instruments			30.258
P-value of Hansen's OIR test			0.6513

Note 1: Robust standard errors are in parentheses.

Note 2: *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Note 3: Three city size dummies and nine area dummies are also included, but their coefficients are not shown.

Table 6: Robustness Checks

Dependent variable	Model 3	Model 4	Model 5	Model 6	Model 7
	Total Net Wealth	Total Net Wealth	Total Net Wealth	Net Financial Assets	Net Real Assets
	GMM	GMM	GMM	GMM	GMM
Coefficients of financial literacy	758.6392**	59,089.0900*	53,083.4600*	36,556.1100**	26,181.5600
	(373.0803)	(31,661.7300)	(32,219.1600)	(16,228.73)	(21,570.3300)
No. of Obs.	2,687	2113	1,232	2687	2,687
R-squared	0.2828	0.2579	0.3137	0.2006	0.2086
F-value of the excluded instruments	30.1025	26.9191	23.7936	30.2580	30.2580
P-value of Hansen's OIR test	0.6531	0.7711	0.8319	0.3180	0.9928
	The measure of financial literacy is the number of correct answers	Respondents who are not retired	Respondents who are married and mainly decide savings and investments for their households	Dependent variable is net financial assets	Dependent variable is net real assets

Note 1: Robust standard errors are in parentheses.

Note 2: *, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively.