Empirical Analysis on Understanding of Financial Products*

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Abstract

The Principles for Customer-Oriented Business Conduct, which was published by the Financial Services Agency of Japan in 2017, requires financial institutions to provide important information in an easy-to-understand manner and provide services suited to customers. Under the Principles, financial institutions have to take two steps to provide services suited to customers. First, they have to distinguish the customers who purchase financial products without sufficient understanding of the financial products and/or who are unable to make an appropriate decision when purchasing financial products with a complex structure from the rest of the customers. Second, they have to provide these groups of customers with financial services that help their understanding of the financial products and well-informed decision-making. However, how exactly financial institutions should proceed to the first step remains an open question. To fill this gap, this paper conducts an empirical study on how financial institutions could proceed to the first step by distinguishing the abovementioned groups of customers from the rest of the customers by asking the following two questions. First, what are the typical demographic characteristics of the customers who purchase stocks, investment trusts, foreign currency-denominated deposits and money market funds (MMF) without sufficient understanding of these products? Second, what are the typical demographic characteristics of the customers who are unable to make an appropriate decision when purchasing financial products with a complex structure? According to an empirical analysis based on household data from the Financial Literacy Survey conducted in 2016, to distinguish between customers, it is useful to examine information on customers' financial literacy that evaluates their capability to make informed decisions on savings and investment from three viewpoints—(1) understanding of compound interest rates, (2) understanding of changes in the real value of financial assets due to inflation, and (3) understanding of the effect of diversified investments—in addition to looking at traditional demographic variables such as the financial asset holdings, annual income, age, and gender. That is because customers with high financial literacy from the three viewpoints are likely to engage in desirable investment behaviour in the following sense: they have a certain degree of understanding of the characteristics of financial products with a complex structure, and they purchase such financial products only if they understand the investment risks related to the

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financial products.

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I. Introduction

There is a growing need for Japanese households to invest in risky but high-yielding financial assets to prepare their retirement savings. Behind this growing need lie the long period of low economic growth after the bursting of the asset price bubble in the 1990s, the resulting low-interest rates, and the aging of the population that began to take hold in the 2000s. These changes, combined with the expected reductions in the ratio of the benefit from the national pension system to workers' income and the proliferation of defined contribution pensions in company pensions, raise the possibility that investing in safe but low-yielding financial products alone will not necessarily provide sufficient retirement savings. Note that each household's life expectancy, income, financial asset holdings, expenditures, and bequests are different. Therefore the current situation does not require that every Japanese household should invest in risky but high-yielding financial assets. However, going forward, high-yielding, safe, easy-to-understand financial assets, such as the fixed-amount postal savings of the early 1990s, are unlikely to exist.

Despite the changing landscape of retirement savings, 1,008 trillion yen of Japan's 1,903 trillion yen of household financial assets are held in cash and deposits (Flow of Funds Statistics 2019, fourth-quarter preliminary report). That is why the Financial Services Agency (FSA) of Japan has been aimed at ensuring stable financial asset accumulation by Japanese citizens and establishing and entrenching customer-oriented business conduct by financial institutions.

Regarding the measures to ensure stable financial asset accumulation, the FSA has taken measures such as the small investment tax exemption system from 2014 and the expansion of the eligibility for the individual defined contribution pension plan from fiscal 2017. Financial education programs by the FSA, The Central Council for Financial Services Information, the National Bankers Association, and others are also taking place because financial knowledge is required to purchase financial products with a complex structure that can cause a loss of principal. Regarding the customer-oriented business conduct by financial institutions, the FSA published its Principles for Customer-Oriented Business Conduct on March 30, 2017. The FSA's website summarizes its subsequent implementation (https://www.fsa.go.jp/policy/kokyakuhoni/kokyakuhoni.html).

Principles 5 and 6 of the Customer-Oriented Business Conduct stipulate the following points.

Principle 5: *Providing important information in an easy-to-understand manner*

Given the asymmetry of information with customers, financial service providers should provide important information on the sale and recommendation of financial products and services in an easy-to-understand manner so that customers can understand them. Note 1 of Principle 5 lists the basic profits (returns), losses and other risks, and trading conditions of financial products and services sold or recommended to customers as important information that should be included here.

Principle 6: *Providing services appropriate for the customer*

A financial service provider should understand the financial business, the asset situation, transaction experience, knowledge, and objectives and needs of its customers, and should formulate, sell, and recommend financial products and services that are appropriate for the customers concerned.

To achieve the aim of principles 5 and 6, the FSA is urging investment trust distributors to publish three key performance indicators (KPIs): the ratio of customers by investment income and loss, the cost and return of the top 20 investment trusts under custody, and the risk and return of the top 20 investment trusts under custody. The FSA (2019a) investigates how Customer-Oriented Business Conduct is used by the sales clerks in financial institutions and by customers in their choice of financial institution. The Financial System Council's Market Working Group Report (FSA (2019b)) also provides guidelines for financial institutions to explain the financial products and to charge appropriate fees by the age groups of the customers following the Customer-Oriented Business Conduct in light of the "age of 100 years of life" (FSA (2019b), pp. 26–28). Annex 2 of the report, "How to provide financial services in an aging society," states that it is recognized that Customer-Oriented Business Conduct are not being thoroughly implemented, as follows:

Two years have passed since the formulation of the "Customer-Oriented Business Conduct Principles", and some financial institutions have made progress in their efforts. To make further improvements, financial service providers must take a fresh look at what it means to be customer-oriented in their business. (FSA [2019b], p. 44)

In this paper, we ask two empirical questions to help financial institutions implement Principles 5 and 6 of the Customer-Oriented Business Conduct.

First, what are the typical demographic characteristics of the customers who purchase stocks, investment trusts, foreign currency-denominated deposits and money market funds (MMFs) without sufficient understanding of these products?

Second, what are the typical demographic characteristics of the customers who are unable to make an appropriate decision when purchasing financial products with a complex structure?

The above two questions are important because financial institutions should distinguish between customers who purchase stocks, investment trusts, foreign currency denominated deposits and MMFs without a good understanding of these financial products, customers who are unable to make an appropriate decision when purchasing financial products with a complex structure, and the rest of the customers to provide appropriate services to their cus-

tomers following Principles 5 and 6. For example, the FSA (2019b) points out that going forward, financial institutions should "providing services that are appropriate for customers, such as not selling products that are excessively risky in light of their circumstances (FSA [2019b], p. 44)."

For the empirical analysis, in addition to standard customer demographics variables such as annual income, financial asset holdings, gender, and age, a financial literacy index (hereafter FLI) computed from individual data from the Financial Literacy Survey conducted by the Central Council for Financial Services Information in 2016 (hereafter FLS 2016) will be used. The results from the empirical analysis suggest that the use of FLI in combination with standard customer information such as financial assets, annual income, age, and gender to distinguish between customers who purchase stocks, investment trusts, foreign currency denominated deposits and MMFs without a good understanding of these financial products, customers who are unable to make an appropriate decision when purchasing financial products with a complex structure, and the rest of the customers. This is because customers with a high level of FLI are likely to have some understanding of financial products and to take appropriate investment behaviors, in the sense that they will buy them only if they understand the investment risks related to the financial products. However, this result does not mean that the standard demographic information should be ignored, rather, it does indicate that the FLI is useful when the standard demographic information is taken into account.

Financial literacy is a technical term whose meaning differs from field to field. We follow Lusardi and Mitchell (2014) to define financial literacy as the following three concepts that economists regard as the basis for making informed decisions about saving and investing. First, the ability to calculate interest rates, such as compound interest rates, second, an understanding of the real value changes in financial assets due to inflation, and third, an understanding of risk diversification through diversified investments in stocks. In addition to the FLS 2016 used in this paper, there are three survey data whose questions allow researchers to compute the FLI: The 2010 wave of the Preference Parameters Study (hereafter PPS 2010) of Osaka University's 21st Century Center of Excellence (COE) Program 'Behavioral Macrodynamics Based on Surveys and Experiments' and its Global COE project 'Human Behavior and Socioeconomic Dynamics'; the 2010 wave of the National Survey on Work and Family conducted by the Nihon University Population Research Institute; and the 2009 wave of the Japanese Study on Aging and Retirement by the Research Institute of Economy, Trade and Industry, Hitotsubashi University, and the University of Tokyo. Sekita (2011) examined the relationship between financial knowledge and retirement planning using the PPS 2010 and pointed out that people with more financial knowledge tended to plan for their retirement. A lot of studies examined the relationship between financial literacy and asset accumulation and investment in risky assets. Recent examples include Sekita (2013), Kadoya and Khan (2017, 2020), Kadoya et al (2017), Ito et al (2017), Sekita et al (2018), Shimizutani and Yamada (2018), and Gan et al (2019). These studies show that people who buy risky financial assets tend to be more financially literate. In addition to the experience of purchasing financial products, we examine the typical demographic characteristics of the customers

who purchase stocks, investment trusts, foreign currency-denominated deposits and MMFs without sufficient understanding of these products. We also examine the typical demographic characteristics of the customers who are unable to make an appropriate decision when purchasing financial products with a complex structure.

When choosing an actual financial product, households need both financial literacy based on the mathematical knowledge that the FLI approximates and practical knowledge of various financial matters. For example, if a man got a mortgage from the bank, he would gain a lot of financial knowledge through the repayment of the mortgage. If a woman bought a small amount of investment trusts, she would gain investment experience. Therefore, it is important to note that the FLI used in this paper captures a part of financial knowledge that is useful when choosing a financial product.

The organization of this paper is as follows. Section II explains the data used in the analysis. Section III analyzes the typical demographic characteristics of the customers who purchase stocks, investment trusts, foreign currency-denominated deposits and money market funds without sufficient understanding of these products. In Section IV, we analyze the typical demographic characteristics of the customers who are unable to make an appropriate decision when purchasing financial products with a complex structure. Section V provides a conclusion.

II. Data

This paper uses individual data from the FLS 2016 with permission from the Central Council for Financial Services Information. The FLS 2016 is a web survey that was administered in Japan from February 29 to March 17, 2016, to 25,000 individuals ages 18 to 79. Following Fujiki (2019), we use questions on the experience of buying stocks, investment trusts, foreign currency denominated deposits and MMFs, and questions on the understanding of the characteristics of the financial products, as well as questions on an appropriate decision when purchasing financial products with a complex structure. In addition to the objective and self-evaluation of respondents' financial knowledge, demographic information such as income and age should be taken into account in statistical analysis.

Since the purpose of the following analysis is to examine customer behavior in purchasing financial products and to explore the implications of financial institutions, the respondents who choose financial products should be the targets of the analysis. Therefore, we use Question 35 of the FLS, asking that "At what opportunities do you mainly acquire knowledge or information when you choose financial products?" We focus on 14,766 respondents, excluding those who chose "I don't select financial products" for the question. Respondents who selected "I don't select financial products" could have a variety of backgrounds, such as having enough financial assets through bequests, not being able to invest in a financial product because they do not have enough income to save, not needing to invest in a financial product because they are only setting aside safe assets in retirement, or someone in their family is investing in a financial product, but the details are unknown.

II-1 Experience in purchasing stocks, investment trusts, foreign currency denominated deposits and MMFs, and understanding of these products

Question 34 is used to describe the experience of buying stocks, investment trusts, foreign currency denominated deposits and MMFs, and the understanding of these products. Question 34 first asks the respondent "Have you ever purchased any of the following financial products, stocks, investment trusts, and foreign currency denominated deposits and MMFs? Choose only one answer from two options:"

1. I have purchased them
2. I have never purchased them

Question 34 also asks for those who had purchased stocks, investment trusts, and foreign currency denominated deposits and MMFs to choose from four options:

1. I understood the product details well enough to be able to explain to other people (hereafter *very well*)
2. I understood the product details to a certain extent (hereafter *to some extent*)
3. I did not understand the product details so well (hereafter *not so well*)
4. I did not understand the product details at all (hereafter *did not understand*)

Figure 1 shows the proportion of people who chose each option for Question 34.

Figure 1. Experience of buying stocks, investment trusts, foreign currency denominated deposits and MMFs, and understanding of the products

% to total

	I have purchased them					I have never purchased them
		Very well	To some extent	Not so well	Did not understand	
Stocks	48.3	6.3	31.4	8.1	2.6	51.7
Investment trusts	41.2	3.8	24.8	10.0	2.7	58.8
Foreign currency denominated deposits and MMFs	27.6	3.3	17.6	5.1	1.7	72.4

Number of observations = 14,766

Source: Fujiki (2019), Chart 6.

Figure 1 shows that only 48%, 41%, and 28% of the respondents who choose a financial product have purchased stocks, investment trusts, and foreign currency denominated deposits and MMFs, respectively. Also, among those who had purchased the product, a total of 11%, 13%, and 7% of respondents have a poor understanding of them because they choose either *not so well* or *did not understand*. Conditional on the purchase of stocks, investment trusts, and foreign currency denominated deposits and MMFs, the percentage of respondents who choose either *not so well* or *did not understand* is 22%, 31%, and 24% for stocks, investment trusts, and foreign currency denominated deposits and MMFs, respectively.

According to Principle 5 "*Providing important information in an easy-to-understand manner*" of Customer-Oriented Business Conduct, important information includes the profit (return), loss and other risks, and trading conditions of financial products and services that are sold or recommended to customers. Economists will disagree on whether the above results are contrary to Principle 5 or not depending on the situation of the customer. For exam-

ple, a customer might be overconfident in his or her financial knowledge and might purchase the product without having the product well explained by the financial institution. A customer might be forced to purchase the product without having the product well explained by the institution (for example, in the case of a customer with dementia). We are not interested in determining whether the results are consistent or inconsistent with Principle 5, but rather in recognizing the findings that some customers were buying financial products without a full understanding of them.

II-2 Appropriate decision when purchasing financial products with a complex structure

Question 37 is used to check respondents' understanding of the appropriate decision when purchasing financial products with a complex structure.

Q37. Which of the following is appropriate as an action to take when considering the purchase of a financial product with a complicated structure? Choose only one answer.

1. Purchasing the product if it is selling well, even if you do not understand its structure clearly (hereafter *sold well*)
2. Purchasing the product if you can trust the financial institution providing the product, even if you do not understand its structure clearly (hereafter *trust financial institutions*)
3. Purchasing the product if you can expect a high return, even if you do not understand its structure clearly (hereafter *high expected return*)
4. Purchasing the product if you understand its structure and find no problem (hereafter *understand*)
5. Don't know (hereafter *don't know*)

Figure 2 shows the proportion of people who chose each option for Question 37. According to Figure 2, among the respondents who choose a financial product, 2% choose *sold well*, 4% choose *trust financial institutions*, 4% choose *high expected return*, 79% choose *understand*, and 12% choose *don't know*.

Option 4 is the preferred response, with nearly 80% of respondents choosing it. On the other hand, while options 1 through 3 are inappropriate actions, a total of 10% of respondents chose these alternatives. Also, 12% of the respondents selected *don't know*.

Figure 2. Appropriate actions to take when purchasing a financial product with a complex structure

	% to total
Sold well	2.0
Trust finanical institutions	4.0
High expected return	3.7
Understand	78.6
Don't know	11.7

Number of observations = 14,766

Source: Author's calculations

Principle 6 "*Providing services appropriate for the customer*" of the Customer-Oriented Business Conduct states that "the company should understand the financial business, the client's asset situation, transaction experience, knowledge, and the purpose and needs of the transaction, and structure, sell, and recommend financial products and services that are appropriate for the client." Therefore, it seems to be against Principle 6 if financial institutions sold financial products to customers without sufficient understanding of these products. However, the fact that as many as 4% of customers choose *trust financial institutions* may mean that customers trust financial institutions and buy financial products under the guise of a lack of sufficient understanding of these products. This possibility should be emphasized by financial institutions. This is because, in the event of a loss from that product, the customer may not consider it is a result of his/her well-informed judgment about his/her investment but may claim to have been solicited by the financial institution.

II-3 Financial Literacy Index

Lusardi and Mitchell (2014) made an international comparison of the empirical analysis using the FLI, which measures financial knowledge from the percentage of correct answers to three questions about the compound interest rates, changes in the real value of financial assets due to inflation, and the effect of diversified investments. The results show that the percentage of correct answers varies depending on countries' historical experiences on financial systems and that financial knowledge tends to be higher for older and more educated people and lower for women. For the sake of international comparison, we used the FLI measured by the number of correct answers to the following questions on compound interest rates in questions 18 and 19, on changes in the real value of financial assets due to inflation in question 20, and on stock diversification investments on sub-question 4 in question 21 as below.

Question 18: Suppose you put 1 million yen into a savings account with a guaranteed interest rate of 2% per year. If no further deposits or withdrawals are made, how much would be in the account after 1 year, once the interest payment is made? Disregard tax deductions. Answer with a whole number in units of 10,000 yen or select "Don't know."

Question 19: Then, how much would be in the account after 5 years? Disregard tax deductions. Choose only one answer. Choice 1. More than 1.1 million yen, 2. Exactly 1.1 million yen, 3. Less than 1.1 million yen, 4. Impossible to tell from the information given, 5. Don't know.

Question 20: Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? Choose only one answer. Choice 1. More than today, 2. Exactly the same, 3. Less than today, 4. Don't know.

Question 21–4: Please indicate whether you think the following statements are true or false. Choose one answer for each item. "Buying a single company's stock usually provides a safer return than a stock mutual fund." Choices 1. True, 2. False, and 3. Don't know.

The FLI is a total score of 1 point for those who answered both questions 18 and 19 correctly, 0 point for others, 1 point for those who answered question 20 correctly, 0 point for those who answered incorrectly, 1 point for those who answered question 21 correctly, and 0 point for those who answered incorrectly.

Figure 3 shows the distribution of the value of FLI over the respondents. Respondents whose index take values of 0, 1, 2, and 3 were 16%, 23%, 31%, and 30% of the total, respectively. The FLI is suitable for an objective evaluation of mathematical skills in understanding financial instruments. Many other ways of measuring financial literacy can be considered, but I will leave the details to Fujiki's (2019) literature review section.

Figure 3. FLI

FLI	Observations	% to total
0	2,426	16.4
1	3,415	23.1
2	4,509	30.5
3	4,416	29.9
Total	14,766	100.0

(Source) Author's calculations

II-4 Self-evaluation of financial knowledge

The FLI is an example of an objective evaluation of financial knowledge, but financial literacy through subjective evaluation is also often used in the economics literature. Therefore, this paper also used the following Question 17 in the FLS 2016 for self-evaluation of knowledge about finance in general.

Question 17: How would you rate your overall knowledge about financial matters compared with other people? Choose only one answer. Choice 1. Very high, 2. High, 3. About average, 4. Low, 5. Very low, 6. Don't know.

The percentages of those who chose choices 1–6 are 2%, 16%, 49%, 24%, 8%, and 1%, as summarized in Figure 4. 49% chose About average and 32% chose Low or Very low, in-

dicating that the self-evaluation of their knowledge of finance was skewed in a below-average direction. In the following, dummy variables for self-evaluation were constructed with a value of 1 for those who chose very high (hereafter *Self_evaluation_very_high*), quite high (hereafter *Self_evaluation_high*), about average (hereafter *Self_evaluation_average*), low (hereafter *Self_evaluation_low*), and very low (hereafter *Self_evaluation_very_low*), otherwise take a value of zero. We took the respondents who chose Don't know as the base category.

Figure 4. Self-evaluation of financial knowledge

	Observations	% to total
Very high	246	1.7
High	2,402	16.3
Average	7,233	49.0
Low	3,555	24.1
Very low	1,150	7.8
Don't know	180	1.2
	14,766	100.0

(Source) Author's calculations

II-5 Demographic Variables

The following dummy variables summarized in Figure 5 were created from the questions about the demographics of the survey respondents. Those include annual income including tax (*<Income>*, range of 10,000 yen, abbreviations in parentheses, and _NA means no answer), *Financial asset holdings* (range of 10,000 yen; _NA indicates no answer), *Age* (in increments of 5 years old; 18–24 years old is the base category), gender (*<Male>* takes a value of 1 for males, 0 for females), occupation (company employee in private companies or public sector (*<Private>*, *<Public>*), *<Self-employed>*, part-time jobs *<Part-time>*, full-time husbands/housewives *<House>*, and *<Student>*), educational attainment (High school, *<Vocational college>*, *<Junior college>*, *<University>*, *<Graduate school>*), experience of financial trouble (*<Financial trouble>* takes a value of 1 for those who have experience of financial trouble, the frequency of obtaining financial and economic information in newspapers, television, and the Internet, etc. (everyday *<Info_everyday>*, once a week *<Info_everyweek>*, once a month *<Info_everymonth>*, less than once a month *<info < everymonth>*), whether or not you have a loan (*<Debt>* takes value of 1 for those with debt), and area of residence (8 regions, *<Hokakido>*, *<Tohoku>*, *<Chyubu>*, *<Kinki>*, *<Cyugoku>*, *<Shikoku>*, and *<Kyusyu>* excluding the Kanto region for the base category). The mean val-

ues of these variables are shown in Figure 5.

The base category group in the remaining analysis has the following demographic characteristics given the construction of variables listed in Figure 5: respondents do not know their self-evaluation of financial knowledge as described in Figure 4; their annual income

Figure 5. Means of demographic variables

Income_0	0.022	Age25_29	0.071	Financial trouble	0.063
Income_250~500	0.305	Age30_34	0.072	Info_everyday	0.446
Income_500~750	0.185	Age35_39	0.102	Info_everyweek	0.231
Income_750~1000	0.118	Age40_44	0.082	Info_everymonth	0.092
Income_1000~1500	0.064	Age45_49	0.079	Info < everymonth	0.157
Income_1500_	0.021	Age50_54	0.084	Debt	0.297
Income_NA	0.148	Age55_59	0.095	Hokkaido	0.042
Financial asset holdings_0	0.074	Age60_64	0.097	Tohoku	0.070
Financial asset holdings_250~500	0.112	Age65_69	0.123	Hokuriku	0.041
Financial asset holdings_500~750	0.064	Age70_74	0.102	Chubu	0.144
Financial asset holdings_750~1000	0.061	Age75_	0.044	Kinki	0.166
Financial asset holdings_1000~2000	0.095	Male	0.490	Chugoku	0.058
Financial asset holdings_2000_	0.168	Private	0.321	Shikoku	0.031
Financial asset holdings_NA	0.277	Public	0.039	Kyusyu	0.108
		Self-employed	0.071		
		Part-time	0.128		
		House	0.225		
		Student	0.030		
		Senior high	0.293		
		Vocational college	0.092		
		Jounior college	0.121		
		University	0.425		
		Graduate school	0.049		

(Source) Author's calculations

including tax is above 0 yen and up to 2.5 million yen; their financial assets holdings are above 0 yen and up to 2.5 million yen; their age is 18–24 years; they are female; their occupation is unemployed or any other occupations listed in Figure 5; their education is up to junior high school or other schools listed in Figure 5; they have never had any financial troubles; they have never looked at financial and economic information in newspapers, on TV, or on the Internet; and they live in the Kanto region.

III. What are the typical demographic characteristics of the customers who purchase stocks, investment trusts, foreign currency-denominated deposits and MMFs without sufficient understanding of these products?

III-1 Methodology

Figure 1 shows that 22%, 31%, and 24% of the respondents who had purchased stocks, investment trusts, and foreign currency denominated deposits and MMFs had little understanding of the characteristics of these financial products. In the following section, we analyzed the relationship between the probability of responding *very well, to some extent, not*

so well, did not understand, and *I have never purchased them* and the respondents' demographic characteristics using a multinomial logit model. We report the marginal effects computed from the estimated regression coefficients of the multinomial logit model (Interested readers can see the estimated regression coefficients of the multinomial logit model used in the analysis in Fujiki (2019)). The marginal effect, when the explanatory variable is continuous, indicates the range of change in the probability of responding *very well, to some extent, not so well, did not understand,* and *I have never purchased them* when that variable changes by one unit. If the explanatory variable is a dummy variable, the range of change in responding *very well, to some extent, not so well, did not understand,* and *I have never purchased them* is shown when the value changes from 0 to 1 (e.g., for males) compared to the base category (e.g., for females). The marginal effects are calculated using the dydx option of the margins command of the econometric software Stata 14.

III-2 The demographic characteristics of the respondents who selected not so well and did not understand

First, consider who is more likely to select *not so well* and *did not understand*.

Columns 4 and 5 of Figures 6, 7, and 8 show estimates of the marginal effects that measure how much the probability of respondents choosing *not so well* and *did not understand* changes when the FLI described in row 1 changes by one unit among respondents who have purchased stocks, investment trusts, and foreign currency denominated deposits and MMFs, and how much the probability of respondents choosing *not so well* and *did not understand* changes when the other dummy variables change from the criterion group to the group in question. *, **, and *** on the right shoulder of the coefficient indicate that the marginal effect is statistically significant at the 10%, 5%, and 1% levels of significance. The marginal effects on occupation, education, and area of residence dummies are not reported, so interested readers are referred to Fujiki (2019).

The effect of the FLI is reported in the second row of Figure 6, Figure 7, and Figure 8; looking at columns 4 and 5, the coefficients are negative and statistically significant, except for *not so well* about stocks in Figure 6, so respondents with a higher value of the FLI are less likely to choose *not so well* or *did not understand*. The reason why the results for stocks differ from those of the other two products may be that a good understanding of stock investment requires other kinds of financial knowledge than the mathematical background that the FLI captures.

Rows 3 through 7 of Figure 6, Figure 7, and Figure 8 report the impact of self-evaluation of financial knowledge. In the case of stocks in Figure 6, looking at columns 4 and 5, the probability of choosing *not so well* tends to be lower if the respondents select *Self_evaluation_very_high,* and the probability of choosing and *did not understand* tends to be lower if the respondents select *Self_evaluation_high*. In the case of investment trusts in Figure 7, looking at columns 4 and 5, the probability of choosing *not so well* tends to be higher if the respondents select Se*lf_evaluation_low,* and the probability of choosing *did not understand*

tends to be lower if the respondents select *Self_evaluation_average*.

The impact of *Income* is reported in rows 8–14 of Figure 6, Figure 7, and Figure 8. As *Income* increases, the probability of choosing *not so well,* in the case of the investment trusts in Figure 7, decreases.

Rows 15 through 21 of Figure 6, Figure 7, and Figure 8 report the impact of *Financial asset holdings*; looking at column 4, in all cases, the probability of choosing *not so well* increases as *Financial asset holdings* increase. This point shows that just because one has a high financial asset holdings does not necessarily mean that one has a proper understanding of financial products. The probability of choosing *did not understand* increases for *Financial asset holdings* of 7.5–10 million yen for stocks, 2.5–5 million yen for investment trusts, and 2.5–7.5 million yen and more than 20 million yen for foreign currency denominated deposits and MMFs.

Rows 22 through 32 of Figure 6, Figure 7, and Figure 8 report the effect of *Age*; looking at column 4, in all cases, the probability of choosing *not so well* increases with increasing *Age*. The probability of choosing *did not understand,* increases at *Age* 65–69 for stocks, decreases at *Age* 35–39 for investment trusts, and decreases at *Age* 35–39 and 45–49 for foreign currency denominated deposits and MMFs.

Figure 6. Understanding of characteristics of stocks (marginal effect)

	Very well	To some extent	Not so well	Did not understand	I have never purchased them
FLI	-0.004 **	0.040 ***	-0.001	-0.006 ***	-0.028
Self-evaluation_very_high	0.165 ***	0.094 *	-0.114 **	0.003	-0.149
Self-evaluation_high	0.092 ***	0.142 ***	-0.019	-0.022 **	-0.193
Self-evaluation_average	0.024	0.093 **	0.007	-0.016	-0.107
Self-evaluation_low	0.000	-0.025	0.037	-0.004	-0.009
Self-evaluation_very_low	0.004	-0.081 *	0.013	0.004	0.060
Income_0	0.002	0.021	0.003	0.012	-0.037
Income_250~500	0.002	-0.023 *	-0.009	-0.006	0.035
Income_500~750	-0.004	-0.011	-0.003	-0.005	0.023 **
Income_750~1000	0.006	-0.023	-0.003	-0.005	0.025 **
Income_1000~1500	0.002	-0.002	-0.007	-0.011	0.017 ***
Income_1500_	0.017	0.008	-0.024	0.005	-0.006
Income_NA	0.009	-0.017	-0.010	-0.007	0.025
Financial asset holdings_0	0.010	-0.088 ***	-0.008	-0.015 **	0.102
Financial asset holdings_250~500	0.010	0.014	0.031 ***	0.000	-0.055
Financial asset holdings_500~750	0.012	0.063 ***	0.008	-0.003	-0.080
Financial asset holdings_750~1000	0.020 **	0.034 **	0.029 ***	0.010 *	-0.093
Financial asset holdings_1000~2000	0.019 **	0.079 ***	0.026 ***	0.000	-0.124 *
Financial asset holdings_2000_	0.034 ***	0.073 ***	0.021 **	0.003	-0.131 *
Financial asset holdings_NA	-0.006	0.019	0.002	-0.002	-0.013 **
Age25_29	0.006	0.020	-0.016	-0.003	-0.007 **
Age30_34	-0.018	0.091 ***	-0.013	0.001	-0.061 **
Age35_39	-0.016	0.075 **	0.019	-0.004	-0.075 ***
Age40_44	-0.014	0.087 ***	0.008	-0.004	-0.077 ***
Age45_49	-0.010	0.067 **	0.024	0.001	-0.083
Age50_54	-0.026 *	0.106 ***	0.013	0.009	-0.103 **
Age55_59	-0.027 *	0.121 ***	0.033 *	-0.003	-0.125
Age60_64	-0.030 **	0.143 ***	0.030	0.011	-0.155
Age65_69	-0.030 **	0.194 ***	0.045 **	0.021 **	-0.231
Age70_74	-0.035 **	0.243 ***	0.041 **	0.015	-0.264
Age75_	-0.042 ***	0.237 ***	0.054 ***	0.014	-0.263 **
Male	0.045 ***	0.075 ***	0.000	-0.001	-0.119 *
Financial trouble	0.024 ***	-0.024 *	0.024 ***	0.014 ***	-0.038 **
Info_everyday	0.002	0.298 ***	-0.028 ***	-0.015 ***	-0.257
Info_everyweek	-0.034 ***	0.231 ***	-0.008	-0.012 **	-0.177
Info_everymonth	-0.035 **	0.183 ***	-0.004	-0.008	-0.136
Info < everymonth	-0.048 ***	0.144 ***	-0.025 **	-0.004	-0.068
Debt	0.003	-0.014 *	0.004	0.002	0.006 *

(Note) *** is statistically significant at the 1%, ** at the 5%, and * at the 10% level. Marginal effects on occupation, educational attainment, and area of residence dummies are not reported.
(Source: excerpted from Fujiki (2019), Chart 17)

Figure 7. Understanding of characteristics of investment trusts (marginal effect)

	Very well	To some extent	Not so well	Did not understand	I have never purchased them
FLI	0.003 *	0.042 ***	-0.006 **	-0.005 ***	-0.034 ***
Self-evaluation_very_high	0.096 ***	0.126 ***	-0.064	-0.001	-0.158 ***
Self-evaluation_high	0.048 **	0.140 ***	0.013	-0.024 **	-0.177 ***
Self-evaluation_average	0.004	0.073 *	0.036	-0.016	-0.097 **
Self-evaluation_low	-0.039 *	-0.001	0.055 *	-0.005	-0.010
Self-evaluation_very_low	-0.039	-0.059	0.014	0.005	0.080 *
Income_0	0.007	0.007	-0.044 *	0.003	0.027
Income_250~500	-0.004	0.012	-0.015 *	-0.005	0.012
Income_500~750	0.000	0.007	-0.013	-0.007	0.014
Income_750~1000	0.004	0.001	-0.021 **	-0.011 *	0.026
Income_1000~1500	0.007	0.015	-0.045 ***	-0.005	0.027
Income_1500_	0.020 **	0.011	-0.038 *	-0.002	0.009
Income_NA	0.002	0.025	-0.023 **	-0.011 *	0.007
Financial asset holdings_0	0.001	-0.078 ***	-0.023	0.001	0.099 ***
Financial asset holdings_250~500	0.007	0.042 ***	0.018 *	0.009 *	-0.076 ***
Financial asset holdings_500~750	0.001	0.071 ***	0.031 ***	0.006	-0.110 ***
Financial asset holdings_750~1000	0.005	0.077 ***	0.016	0.007	-0.106 ***
Financial asset holdings_1000~2000	0.010	0.105 ***	0.030 ***	0.001	-0.146 ***
Financial asset holdings_2000_	0.019 ***	0.140 ***	0.042 ***	0.009	-0.210 ***
Financial asset holdings_NA	0.002	0.054 ***	-0.008	0.002	-0.050 ***
Age25_29	0.016	0.038	-0.017	-0.013	-0.024
Age30_34	-0.001	0.034	-0.014	-0.012	-0.007
Age35_39	0.002	0.066 *	-0.002	-0.017 *	-0.048
Age40_44	-0.003	0.074 **	0.011	-0.006	-0.076 **
Age45_49	0.010	0.083 **	-0.003	-0.002	-0.088 ***
Age50_54	-0.007	0.118 ***	0.013	0.000	-0.124 ***
Age55_59	-0.012	0.108 ***	0.028	-0.003	-0.121 ***
Age60_64	-0.016	0.144 ***	0.043 **	0.004	-0.175 ***
Age65_69	-0.013	0.152 ***	0.060 ***	0.014	-0.213 ***
Age70_74	-0.010	0.194 ***	0.073 ***	0.004	-0.261 ***
Age75_	-0.009	0.174 ***	0.073 ***	0.001	-0.239 ***
Male	0.011 **	0.002	-0.011 *	-0.001	0.000
Financial trouble	0.007	0.037 ***	0.027 ***	0.018 ***	-0.090 ***
Info_everyday	0.015	0.181 ***	0.000	-0.018 ***	-0.178 ***
Info_everyweek	-0.014	0.146 ***	0.024 *	-0.021 ***	-0.135 ***
Info_everymonth	-0.022	0.123 ***	0.029 **	-0.008	-0.122 ***
Info < everymonth	-0.007	0.047 *	0.024 *	-0.011 **	-0.053 **
Debt	0.002	-0.024 ***	-0.006	-0.003	0.032 ***

(Note) *** is statistically significant at the 1%, ** at the 5%, and * at the 10% level. Marginal effects on occupation, educational attainment, and area of residence dummies are not reported.
(Source: excerpted from Fujiki (2019), Chart 19)

Figure 8. Understanding of characteristics of foreign currency denominated deposits and MMFs (marginal effect)

	Very well	To some extent	Not so well	Did not understand	I have never purchased them
FLI	0.003 **	0.022 ***	-0.006 ***	-0.007 ***	-0.012 ***
Self-evaluation_very_high	0.101 ***	0.079 *	0.038	-0.002	-0.217 ***
Self-evaluation_high	0.061 **	0.090 **	0.019	0.007	-0.177 ***
Self-evaluation_average	0.024	0.029	0.022	0.009	-0.083 **
Self-evaluation_low	-0.014	-0.032	0.026	0.008	0.012
Self-evaluation_very_low	-0.008	-0.101 **	0.008	0.011	0.090 **
Income_0	0.008	0.019	-0.011	-0.014	-0.002
Income_250~500	-0.004	-0.019 *	-0.007	0.000	0.031 **
Income_500~750	-0.004	-0.008	-0.008	0.002	0.019
Income_750~1000	0.004	-0.022 *	-0.012	0.001	0.029 *
Income_1000~1500	0.005	-0.014	-0.014	-0.001	0.023
Income_1500_	0.016 **	-0.020	-0.011	-0.016	0.031
Income_NA	-0.009	0.001	-0.008	-0.001	0.017
Financial asset holdings_0	0.007	-0.034 *	-0.020 **	-0.002	0.050 **
Financial asset holdings_250~500	0.008	0.018	0.013 *	0.008 **	-0.047 ***
Financial asset holdings_500~750	0.009	0.036 **	0.022 ***	0.010 **	-0.077 ***
Financial asset holdings_750~1000	0.017 **	0.043 ***	0.010	-0.002	-0.068 ***
Financial asset holdings_1000~2000	0.014 **	0.064 ***	0.007	0.004	-0.090 ***
Financial asset holdings_2000_	0.020 ***	0.089 ***	0.016 **	0.010 **	-0.134 ***
Financial asset holdings_NA	0.012 *	0.024 *	-0.009	0.004	-0.030 **
Age25_29	-0.007	0.004	0.016	-0.008	-0.006
Age30_34	-0.009	0.066 *	0.026	-0.006	-0.076 **
Age35_39	-0.016	0.115 ***	0.030 *	-0.011 *	-0.118 ***
Age40_44	-0.010	0.120 ***	0.033 **	-0.010	-0.133 ***
Age45_49	-0.007	0.132 ***	0.024	-0.012 *	-0.136 ***
Age50_54	-0.016	0.132 ***	0.021	-0.007	-0.129 ***
Age55_59	-0.022 **	0.127 ***	0.036 **	-0.007	-0.133 ***
Age60_64	-0.026 **	0.136 ***	0.036 **	-0.008	-0.138 ***
Age65_69	-0.032 ***	0.133 ***	0.031 *	-0.009	-0.123 ***
Age70_74	-0.024 **	0.139 ***	0.042 **	-0.007	-0.150 ***
Age75_	-0.032 **	0.142 ***	0.053 ***	-0.014	-0.149 ***
Male	0.008 *	-0.030 ***	0.004	0.006 **	0.013
Financial trouble	0.009 *	0.029 **	0.025 ***	0.012 ***	-0.074 ***
Info_everyday	0.016	0.151 ***	0.006	-0.003	-0.170 ***
Info_everyweek	-0.008	0.122 ***	0.013	-0.004	-0.123 ***
Info_everymonth	-0.012	0.087 ***	0.030 ***	0.000	-0.106 ***
Info < everymonth	-0.005	0.040 *	0.014	-0.003	-0.045 **
Debt	0.001	-0.021 ***	-0.006	0.001	0.026 ***

(Note) *** is statistically significant at the 1%, ** at the 5%, and * at the 10% level. Marginal effects on occupation, educational attainment, and area of residence dummies are not reported.
(Source: excerpted from Fujiki (2019), Chart 21)

The effect of gender is reported in line 33 of Figure 6, Figure 7, and Figure 8. Men are less likely to choose *not so well* for investment trusts, and more likely to choose *did not understand* for foreign currency denominated deposits and MMFs.

The impact of *Financial trouble* is reported in row 34 of Figure 6, Figure 7, and Figure 8. As can easily be expected, a respondent with experience of financial trouble tends to choose *not so well* or *did not understand*.

The 35th through 38th rows of Figures 6, 7, and 8 report the effect of the frequency of people to obtain financial and economic information in newspapers, television, and the Internet. Looking at Figure 6, in the case of stocks, the probability of choosing *not so well* or *did not understand* is lower the more often they are exposed to the information. Figure 7 shows that, in the case of investment trusts, the probability of selecting *not so well* increases with more exposure to information, and the probability of selecting *did not understand* decreases with more exposure to information. Figure 8 shows that in the case of foreign currency denominated deposits and MMFs, the probability of selecting *not so well* is higher for respondents chose *Info_everymonth*.

III-3 Characteristics of the respondents who selected very well

Let's look at the characteristics of the respondents who selected *very well* as reported in the second column of Figures 6, 7, and 8.

Looking at the second column of Figure 6, in the case of stocks, respondents are more likely to select *very well* if they have a lower value of the FLI, very high or high self-evaluation of financial knowledge, *Financial asset holdings* of 7.5 million yen or more, male respondents with experience of financial troubles, and do not look at financial and economic information more than once a week in newspapers, television, or the Internet. Respondents who were over 50 years of *Age* were less likely to select *very well*.

Looking at the second column of Figure 7, in the case of investment trusts, respondents are more likely to select *very well* if they have a high value of the FLI, very high or high self-evaluation of financial knowledge, 15 million yen *Income* or more, 20 million yen *Financial asset holdings* or more, and male.

Looking at the second column in Figure 8, respondents with a higher value of the FLI and a very high or high self-evaluation of financial knowledge, who had an *Income* of 15 million yen or more, had *Financial asset holdings* of 7.5 million yen or more, and males were more likely to select *very well* for foreign currency denominated deposits and MMFs. Respondents over 55 years of *Age* were less likely to select *very well.*

III-4 Characteristics of respondents who selected to some extent

Finally, let's look at the characteristics of respondents who selected *to some extent* as reported in the third column of Figure 6, Figure 7, and Figure 8.

Looking at the third column in Figure 6, in the case of stocks, respondents with a high value of the FLI, self-evaluation of financial knowledge above average, *Financial asset holdings* of 5 million yen or more, 30 years of *Age* or more, male, no experience of financial trouble, and obtain financial and economic information more than once a week through newspapers, television, and the Internet were more likely to select *to some extent*. Respondents with *Income* of 2.5–5 million and zero *Financial asset holdings* were less likely to select *to some extent*.

Looking at the third column in Figure 7, in the case of investment trusts, the probability of selecting *to some extent* tends to be high for a respondent with a high value of the FLI, an above-average self-evaluation of financial knowledge, a high *Financial asset holding*, 35 years of *Age* or older, with experience of financial trouble, and who obtains financial and economic information more than once a week through newspapers, television, and the Internet. Respondents with zero *Financial asset holdings* were less likely to select *to some extent*.

Looking at the third column in Figure 8, respondents who have a high value of the FLI and a very high or high self-evaluation of financial knowledge, more than 5 million yen in *Financial asset holdings*, 30 years of *Age* or older, some experience of financial trouble, and obtain financial and economic information more than once a week through newspapers, television, and the Internet are more likely to select *to some extent* for foreign currency denominated deposits and MMFs. Respondents with *Income* of 2.5–5 million, 7.5–10 million, and zero *Financial asset holdings* were less likely to select *to some extent*.

III-5 Summary of respondents' characteristics

Based on the results of the analysis so far, we summarize the common characteristics of the three financial products as follows.

First, concerning respondents who have a poor understanding of financial products, in terms of selecting *not so well* or *did not understand*, respondents who have high values of the FLI were less likely to choose *not so well* or *did not understand* (except for *not so well* on stocks). Respondents who have higher *Financial asset holdings*, older in *Age* tend to choose *not so well*. Respondents who have experience of financial trouble tend to choose *not so well* or *did not understand*.

Second, the probability of being a respondent who selects *very well* tends to be higher if the respondent has a high self-evaluation of financial knowledge, has *Financial asset holdings* of 20 million yen or more, and has male gender.

Finally, the probability of being a respondent who selects *to some extent* tends to be higher the respondent has a high value of the FLI, has a very high or high self-evaluation of their knowledge of finance, has higher *Financial asset holdings*, and of more than 35 years of *Age*, and obtains more than once a week financial and economic information through newspapers, television, and the Internet.

Financial institutions need to distinguish customers without sufficient understanding of financial products (about 10% in this data set) from customers who do understand them, and information on the FLI may be useful for that purpose. This is because customers with a higher value of the FLI tend to have a better understanding of financial products (except for stocks). It should be noted, however, that this result does not mean that other information should be ignored. Rather, to take into account the heterogeneity of the customers, it seems beneficial to take a comprehensive look at the usual customer demographic information (financial asset holdings, age, gender, annual income) in conjunction with the FLI. For exam-

ple, having high *Financial asset holdings* and being of older *Age* are both associated with a higher probability of selecting *not so well* or *to some extent*, and thus when used as stand-alone information, each of these is unsuitable for distinguishing customers without sufficient understanding of financial products from customers who do understand them. Also, customers who obtain financial and economic information in newspapers, television, and the Internet frequently tend to choose *very well* or *to some extent*, but in the case of stocks, the probability of choosing *very well* tends to be lower if they obtain financial and economic information in newspapers, television, and the Internet longer than or equal to once a week. In the case of foreign currency denominated deposits and MMFs, the probability of choosing *not so well* tends to be higher if they obtain financial and economic information in newspapers, television, and the Internet once a month. The lesson from this point is that being well-informed and understanding financial products are two different issues.

IV. What are the typical demographic characteristics of the customers who are unable to make an appropriate decision when purchasing financial products with a complex structure?

Figure 9 reports the marginal effects calculated from the multinomial logit model of the choice of decision when purchasing financial products with a complex structure from the options of *sold well, trust financial institutions, high expected return, understand,* and *don't know*.

Figure 9 shows that the probability of being a respondent who selects *sold well* tends to be higher for males with a low value of FLI and zero *Financial asset holdings,* who have experienced financial troubles, and who obtain financial and economic information in a newspaper, on TV, or the Internet at least once a month, and the probability of being a respondent who selects *sold well* tends to be lower for respondents with an *Age* of 30–49 and 65–69 whose self-evaluation on financial knowledge is low.

The probability of being a respondent who selects *trust financial institutions* is higher among male respondents who have high *Financial asset holdings* and experience of *Financial troubles* and lower among respondents who obtain financial and economic information in newspapers, television, and the Internet less than daily or monthly, and among respondents with an *Age* of 45–59.

The probability of being a respondent who selects *high expected return* tends to be higher for male respondents with a low value of the FLI and *Financial asset holdings* of 2.5–5 million yen, and lower for those with an *Age* of 40–44 and 50–54.

The probability of being a respondent who selects *don't know* is higher for males with zero *Financial asset holdings* and an *Age* of 70 or older, and lower for those with *Income* of 2.5–7.5 million yen and an *Age* of 25–29, who obtain financial and economic information in newspapers, television, and the Internet.

Finally, the probability of being a respondent who selects *understand* is higher for respondents with a high value of the FLI and a higher self-evaluation of financial knowledge.

Figure 9. Appropriate decision when purchasing financial products with a complex structure (marginal effects)

	Sold well	Trust finanical institutions	High expected return	Understand	Don't know
FLI	-0.009 ***	-0.016 ***	-0.008 ***	0.113 ***	-0.080 ***
Self-evaluation_very_high	0.016	0.024	0.032	0.065	-0.136 ***
Self-evaluation_high	-0.006	0.036 *	0.021	0.067 **	-0.119 ***
Self-evaluation_average	-0.011	0.023	0.030	0.028	-0.071 ***
Self-evaluation_low	-0.018 **	0.016	0.019	0.047	-0.065 ***
Self-evaluation_very_low	-0.008	0.012	0.025	0.034	-0.062 ***
Income_0	0.007	0.013	-0.006	-0.039 *	0.025
Income_250~500	-0.002	-0.007	-0.001	0.026 **	-0.016 **
Income_500~750	0.001	-0.008	-0.005	0.038 ***	-0.027 ***
Income_750~1000	-0.001	-0.009	0.000	0.019	-0.009
Income_1000~1500	-0.002	-0.014	0.002	0.026	-0.012
Income_1500_	0.007	-0.006	0.000	-0.019	0.017
Income_NA	-0.002	-0.002	-0.003	-0.001	0.008
Financial asset holdings_0	0.009 **	0.002	0.003	-0.051 ***	0.037 ***
Financial asset holdings_250~500	0.004	0.023 ***	0.014 **	-0.048 ***	0.006
Financial asset holdings_500~750	0.007	0.027 ***	0.007	-0.045 ***	0.003
Financial asset holdings_750~1000	-0.005	0.015 *	0.011	-0.026	0.004
Financial asset holdings_1000~2000	0.001	0.024 ***	-0.004	-0.027 *	0.006
Financial asset holdings_2000_	-0.008	0.018 **	0.007	-0.015	-0.003
Financial asset holdings_NA	-0.003	-0.003	-0.006	-0.018	0.030 ***
Age25_29	-0.007	-0.003	-0.001	0.046 **	-0.034 **
Age30_34	-0.015 **	-0.008	-0.011	0.057 ***	-0.022
Age35_39	-0.016 **	-0.010	-0.009	0.048 **	-0.013
Age40_44	-0.016 **	-0.009	-0.020 *	0.051 **	-0.007
Age45_49	-0.013 *	-0.025 **	-0.005	0.045 **	-0.002
Age50_54	-0.010	-0.020 *	-0.020 *	0.039 *	0.011
Age55_59	-0.009	-0.022 **	-0.010	0.031	0.009
Age60_64	-0.009	-0.017	-0.008	0.013	0.020
Age65_69	-0.015 **	0.002	0.002	0.004	0.006
Age70_74	-0.008	-0.001	-0.011	-0.022	0.042 ***
Age75_	-0.010	0.014	0.007	-0.043 *	0.032 *
Male	0.013 ***	0.029 ***	0.020 ***	-0.105 ***	0.042 ***
Financial trouble	0.009 **	0.026 ***	0.008	-0.038 ***	-0.006
Info_everyday	0.011 **	-0.016 **	-0.004	0.080 ***	-0.072 ***
Info_everyweek	0.012 **	-0.008	-0.005	0.076 ***	-0.075 ***
Info_everymonth	0.011 *	-0.001	0.007	0.051 ***	-0.069 ***
Info < everymonth	-0.001	-0.014 *	0.001	0.065 ***	-0.051 ***
Debt	-0.003	0.007 *	-0.001	0.012	-0.016 ***

(Note) *** is statistically significant at the 1%, ** at the 5%, and * at the 10% level. Marginal effects on occupation, educational attainment, and area of residence dummies are not reported.
(Source: excerpted from Fujiki (2019), Chart 25)

A situation where a financial institution may be said to have failed to follow Principle 6 of the Customer-Oriented Business Conduct seems to be that customers who choose *trust financial institutions* (4% of respondents in this data set) are misunderstood as customers who choose *understand*, and thus financial institution offered financial products with high risk to this customer.

Respondents who selected *trust the financial institutions* had a low value of the FLI, did not obtain financial and economic information in newspapers, television, or the Internet every day, had experience with *Financial troubles,* and had high *Financial asset holdings*. It is also likely that these respondents have a high self-evaluation of financial knowledge, so they may be reluctant to declare to a financial institution that they do not know how the financial products work. On the other hand, respondents who choose *understand* are more likely to have a high value of the FLI and are more likely to have a high self-evaluation of financial knowledge. Respondents who choose *understand* are also more likely to be female with an *Age* of 25-54, to obtain financial and economic information in newspapers, television, and the Internet every day, to have no experience with financial troubles. Thus, in addition to gender, age, and experience with financial troubles, the FLI might help distinguish between respondents who chose *trust financial institutions* and who chose *understand*.

V. Conclusion

To sell financial products and services that are suitable for customers in line with the Principles 5 and 6 of Customer-Oriented Business Conduct, financial institutions need to distinguish customers who do not fully understand the investment risks related to these financial products, the customers who are unable to make an appropriate decision when purchasing these financial products, and the rest of the customers.

Our analysis shows that about 10% of customers do not have a good understanding of financial products and 4% of customers would buy complex financial products if they did not understand how they work but trusted the financial institutions that offer them. The FLI together with the traditional customer information such as financial asset holdings, annual income, age, gender, and experience of financial troubles might help financial institutions distinguish these customers. In particular, customers with a high value of the FLI are likely to engage in desirable investment behavior in the sense that they have a high understanding of investment trusts and foreign currency denominated deposits and MMFs and will purchase them only if they understand the investment risks related to the financial products.

Since salespeople would not have their customers take a test to calculate the FLI, we report in Figure 10 the marginal effects of customer's demographic characteristics on a value of the FLI computed from a multinomial logit model. Respondents with a score of 3 on the FLI had a high self-evaluation of financial knowledge and were higher among males with *Financial asset holdings* of 20 million yen or more and an *Age* of 35 or older, who had received more education than junior high school, who often obtain financial and economic information through newspapers, television, and the Internet, and who had no experience with

financial troubles. This is consistent with Lusardi and Mitchell (2014), who report that financial knowledge is higher for older people and those with more years of education, but lower for women. The self-evaluation of financial knowledge used in this paper is also information that is difficult to obtain from customers, but even when this variable is excluded, the results are almost the same as in Figure 10.[1] The demographic characteristics of respondents with a high value of the FLI help to distinguish customers who engage in desirable investment behaviors, in the sense that they have a high understanding of investment trusts and foreign currency denominated deposits and MMFs, and will purchase them only if they understand the investment risks related to the financial products.

[1] Note that Figure 13 of Fujiki (2019) conducts the same analysis using the data from all respondents from the FLS, and finds that the respondents with higher *Financial asset holdings* and *Income* are also likely to take the value of 3 of the FIL in addition to the results obtained from Figure 10.

Figure 10. Relationship between the value of FLI and demographic characteristics (marginal effects)

	FLI=0		FLI=1		FLI=2		FLI=3	
Self-evaluation_very_high	-0.054	*	-0.037		-0.051		0.142	***
Self-evaluation_high	-0.119	***	-0.046		0.025		0.140	***
Self-evaluation_average	-0.089	***	-0.019		0.024		0.084	**
Self-evaluation_low	-0.068	***	0.008		0.019		0.041	
Self-evaluation_very_low	-0.029		0.011		-0.003		0.020	
Income_0	0.039	**	0.012		-0.027		-0.024	
Income_250~500	-0.008		0.005		-0.011		0.014	
Income_500~750	-0.010		-0.017		0.007		0.021	
Income_750~1000	-0.014		0.004		-0.026		0.035	**
Income_1000~1500	-0.013		-0.003		-0.013		0.029	
Income_1500_	0.007		-0.073	**	0.066	**	0.000	
Income_NA	0.030	***	0.001		-0.011		-0.020	
Financial asset holdings_0	0.054	***	0.015		-0.003		-0.067	***
Financial asset holdings_250~500	0.005		-0.013		0.003		0.006	
Financial asset holdings_500~750	0.010		0.001		-0.013		0.002	
Financial asset holdings_750~1000	-0.020		0.017		-0.007		0.010	
Financial asset holdings_1000~2000	-0.009		-0.022		0.020		0.011	
Financial asset holdings_2000_	-0.033	**	-0.027	*	0.008		0.052	***
Financial asset holdings_NA	0.045	***	0.010		-0.011		-0.043	***
Age25_29	-0.047	***	0.001		-0.001		0.047	
Age30_34	-0.052	***	-0.028		0.027		0.052	
Age35_39	-0.062	***	-0.051	**	0.055	*	0.058	*
Age40_44	-0.110	***	-0.036		0.033		0.112	***
Age45_49	-0.127	***	-0.057	**	0.073	**	0.111	***
Age50_54	-0.142	***	-0.073	***	0.091	***	0.124	***
Age55_59	-0.161	***	-0.066	***	0.086	***	0.140	***
Age60_64	-0.196	***	-0.076	***	0.119	***	0.153	***
Age65_69	-0.201	***	-0.079	***	0.129	***	0.151	***
Age70_74	-0.217	***	-0.048	*	0.120	***	0.145	***
Age75_	-0.183	***	-0.062	**	0.123	***	0.122	***
Senior high	-0.061	***	-0.003		-0.013		0.077	**
Vocational college	-0.072	***	0.001		0.012		0.059	*
Jounior college	-0.079	***	-0.015		0.007		0.088	**
University	-0.123	***	-0.037		0.015		0.145	***
Graduate school	-0.164	***	-0.065	**	0.010		0.219	***
Male	-0.070	***	-0.065	***	-0.010		0.145	***
Financial trouble	0.030	***	0.029	**	-0.018		-0.041	***
Info_everyday	-0.139	***	-0.101	***	0.042	**	0.197	***
Info_everyweek	-0.126	***	-0.080	***	0.039	**	0.167	***
Info_everymonth	-0.086	***	-0.041	**	0.019		0.109	***
Info < everymonth	-0.070	***	-0.037	**	0.019		0.089	***
Debt	-0.002		0.009		-0.008		0.001	

(Note) *** is statistically significant at the 1%, ** at the 5%, and * at the 10% level. Marginal effects on occupation, educational attainment, and area of residence dummies are not reported.
(Source: Author's calculations)

It is also suggested that the combination of the demographic characteristics of respondents with a high value of the FLI should be used to distinguish between customers who have a detailed understanding of products when purchasing investment trusts, foreign currency deposits, and foreign currency MMFs and the rest of the customers, rather than using age and financial asset holdings in isolation.

Note that the FLI used in this paper focuses on mathematical skills in savings and investment decision making, but the results here do not deny the importance of other financial knowledge. For example, a person with practical knowledge of finance, say through the experience of getting a mortgage from a bank, will have a better understanding of financial products than someone with the same mathematical background. The emphasis on the FLI in this paper is based on the examination on a part of financial knowledge that is useful when choosing financial products.

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