

Financial teaching by parents and financial education at school or workplace: Evidence from Japan

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Abstract

This study investigates the differential roles of financial socialization within the family versus financial education at school or the workplace, using data from a representative sample of 25,000 Japanese individuals. The results indicate that different platforms may play different roles. While the adults' short-term financial behaviors, which involve regular feedback and immediate consequences for deviation, are primarily related to their parent's financial advising in childhood, long-term financial behaviors, which require complex planning and decision-making, are primarily related to financial education received at school or the workplace. The results also suggest the benefits of accumulating financial experiences and education in different stages. © 2022 Academy of Financial Services. All rights reserved.

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1. Introduction

The literature has, in general, revealed an insufficient level or amount of financial literacy around the world. For instance, Atkinson and Messy (2011) reported that few people across countries could correctly answer basic financial literacy questions across 14 countries, and Lusardi and Mitchell (2014) compiled a similar pattern in 12 countries. Questions arise as to whether financial education programs can effectively improve financial literacy and skills that are instrumental in one's personal finances. Empirical studies emerged, using different

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designs and methods to address this question. As will be elaborated in the next section, more recent empirical research, even studies applying the most rigorous research design, randomized controlled trials (RCT), which can better identify causal effects (e.g., Kaiser & Menkhoff, 2017, 2020; Kaiser et al., 2021), has generally documented evidence of a positive effect of financial education offered in schools, communities, or workplaces. One strand of the research investigated the effect of state-mandated financial education, also finding a positive effect. For instance, Stoddard and Urban (2020) showed that high school financial education policies reduced nonstudent debt and loan delinquency rates among 19- to 29-year-olds.

In addition, family is another important platform in which youth can acquire the foundations of financial capability into their adulthood (Consumer Financial Protection Bureau, 2016). Financial socialization theory postulates that youth can grasp financial knowledge and behavioral values within the family through interactions with family members on monetary issues (Gudmunson & Danes, 2011; Hanson & Olson, 2018; Jorgensen et al., 2019). Empirical research on parental financial teaching usually had to rely on data acquired from survey questionnaires, as it can be difficult to conduct an RCT or quasi-experiments on parental teaching within a family. While subject to possible endogeneity and other methodological issues, existing research based on survey data has also revealed a positive association between parental financial advising in childhood or adolescence and financial behaviors in adulthood (e.g., Buccioli & Veronesi, 2014; Grinstein-Weiss et al., 2011; Sansone et al., 2019).

Most existing studies investigated the financial experiences or financial education taking place in a specific platform, being family, school, community, or workplace. However, individuals can receive financial education throughout stages of life—as children, students, and employees. The cumulative effect of financial education can play out, as suggested by Serido and Shim (2014). They reported that financial education, starting in high school and continuing in college, can contribute to more responsible financial behaviors during and after college. Wagner and Walstad (2019) attempted to investigate the distinct influences of financial education received at high schools, colleges, and workplaces.

This study provides additional evidence by further investigating the influence of parental financial advising in childhood vis-à-vis financial education at school or workplace on financial behaviors in adulthood. Such investigation is possible by using data from the Financial Literacy Survey (FLS) 2016—an online survey conducted by Japan's Central Council for Financial Services Information in 2015, which contains self-reported experiences of being taught by parents, the financial education experiences at school or workplace, as well as a set of questions relating to financial knowledge, attitudes, and behaviors. Furthermore, following Wagner and Walstad (2019), this study examined two types of financial behaviors—short-term ones defined as “involving a money or credit management task that gives regular and timely feedback to remind people about what they need to do to change their financial behavior to avoid financial penalties and consequences,” and long-term ones as “involving more planning for the future and are less influenced by regular feedback or learning by doing.”

The results indicate that those who were *only* taught by parents how to manage money primarily manifest desirable short-term behaviors measured by “careful consideration before

purchase,” “paying bills on time,” “watching financial affairs closely,” and “having an emergency fund.” Those who received *only* financial education at school or the workplace primarily displayed desirable long-term behaviors measured by investing in stocks and saving for retirement, while also displaying desirable short-term behaviors to a significantly lesser extent. The results are robust to tests using instrumental-variable and propensity score matching methods.

It is plausible that short-term financial behavior is shaped within the family as children develop sound financial values and attitudes from direct and indirect socialization with family members, particularly parents, leading to behaviors such as paying bills on time. Such socialization and experiences within the family can also strengthen executive functions, resulting in self-control and careful purchase behaviors. Parents can provide timely negative feedback or punishment when children deviate from these practices. On the other hand, financial education at school or the workplace aims at improving knowledge of personal finances and budgeting skills, preparing students or employees for long-term financial behaviors such as retirement planning, saving, or home buying (Fox et al., 2005).

Caution is required when interpreting the results of this study, which has some limitations. Primary potential concerns include recall error, endogeneity, and omitted variables problem, which, together with other issues, will be discussed in the final section. Despite the limitations, this study enriches the financial education literature by providing evidence distinguishing financial socialization in the family from financial education at school or the workplace. The results of differential influences associated with different platforms may provide implications for educators, employers, financial education trade bodies, and policymakers. In addition, evidence from Japanese data can enrich the literature, as the influence of financial education on broader population-level financial knowledge and self-efficacy were understudied outside the United States (Rothwell & Wu 2019).

2. Literature review

Financial well-being is associated with financial capability, the capacity to manage financial resources effectively based on knowledge, skill, and access (Consumer Financial Protection Bureau, 2016). The building blocks of financial capability can be acquired through financial education in the early stage of life. The Consumer Financial Protection Bureau (CFPB) suggests a developmental framework, based on extensive research, for understanding when, where, and how young people learn and develop the following three building blocks (Consumer Financial Protection Bureau, 2016). (1) Executive functions—the cognitive processes used to make plans, focus attention, remember information, and perform multitasks, which are essential in saving, setting financial goals, and managing money. (2) Financial habits and norms—the values, standards, and heuristics used in financial matters, such as making a point of paying bills on time. (3) financial knowledge—familiarity with financial facts and concepts, which helps efficient money management and effective comparison of financial products.

Children and youth acquire these building blocks from their family members or school education. Financial socialization theory postulates that youth grasp financial knowledge and behavioral values within the family through interactions with family members on monetary issues (Gudmunson & Danes, 2011; Hanson & Olson, 2018; Jorgensen et al., 2019). Schools are also crucial for financial socialization by providing structured curricula or activities such as reality fairs or savings-promotion programs.

Empirical studies use different research designs to investigate the effect of financial education on financial literacy, attitudes, or behaviors. Randomized controlled trials (RCT) are ideal for identifying the causal effects. For instance, Frischno (2018) evaluated the impact of a large-scale school-based financial education and found that students improved financial knowledge, self-control, and consumption habits, as of 6~24 months postintervention. Batty et al. (2020) reported that engaging in an experiential economic program (called My Classroom Economy) improved students' financial knowledge of elementary students in the United States. A few studies have emerged applying meta-analysis on the effects of financial education. Fernandes et al. (2014) covered 15 previous RCT studies (up to 2013), which showed no significant effect, which is smaller than that among correlational studies. Another meta-analysis by Miller (2015) covered studies based on RCT (up to 2013) and found similar results—the impact appears limited at best in the outcomes such as savings, credit performance, or financial knowledge. However, more recent meta-analyses covering a more extensive set of studies found an overall positive result. Kaiser and Menkhoff (2020) meta-analyzed 18 previous RCT studies (up to 2019) on the effect of school-based education intervention, reporting significant and positive effect size among students in terms of financial literacy and some financial behaviors. Another meta-analysis by Kaiser et al. (2021) covered a larger set of RCT previous studies (=76) up to 2019, which also include those education programs outside schools, reported positive and positive effects size in terms of financial literacy and some financial behaviors, particularly budgeting, saving and investing. The latter two studies compiled a more significant effect on financial literacy than financial behaviors. They also found that financial education is less effective for some specific behaviors, such as handling debt. In addition to RCT, meta-analyses by Kaiser and Menkhoff (2017, 2020) also investigated studies on nonrandom participants of some sort of educational program, finding positive effects on financial literacy and behaviors.

There also exist empirical studies based on observational data, using natural or quasi-experiments and surveying. For instance, among the 37 previous studies covered by Kaiser and Menkhoff (2020) for their meta-analyses, 19 used a nonrandom design method (with the remaining 18 RCTs). Such studies have more flexibility in the investigated outcomes and more prolonged effects of financial education while also being subject to endogeneity. It requires caution when interpreting the results from observational data.

One strand of research using quasi-experiments assessed the effect of financial education by using the variation in U.S. high school mandates across different states. For instance, 29 states mandated some form of consumer education in secondary schools between 1957 and 1985 to prepare students with practical and useful decision-making skills in financial matters. Bernheim et al. (2001) found that these mandates had a high positive impact on saving rates and wealth accumulation during adulthood as of 1995. Interestingly, Cole et al. (2016) showed that these programs did not improve savings, using a much larger sample and a

more flexible specification. They suggested a possible endogeneity explanation—those states had imposed mandates during rapid economic growth periods, which might have explained the higher savings behavior of concurrent graduates. However, more recent studies did find that financial education mandates reduced defaults and higher credit scores among young adults (Urban et al., 2020), reduced the likelihood and frequency of payday borrowing among young adults (Harvey, 2019a), and increased bank account ownership among young adults with lower educational credentials, while, overall, having no effect on bank account ownership and propensity to save (Harvey, 2019b). Burke et al. (2020) also reported that state-mandated financial education improves financial well-being, primarily accruing to men and those with college degrees.

Aside from quasi-experimental studies, empirical studies rely on large-scale survey data, particularly in the literature on the association between financial literacy and financial behaviors. These surveys contain financial knowledge-related questions used to measure one's financial literacy level. Some large-scale survey contains questions about one's financial experiences and financial education during childhood or adolescence. Such surveys complement the literature on the roles of financial socialization within the family, as it is harder to implement RCT or quasi-experiments on activities within the family. Results based on the survey have, in general, reported a positive relationship between financial socialization during childhood or adolescence and financial behaviors at a later stage.

For instance, Ashby et al. (2011) investigated data from a national survey in the United Kingdom, finding that adults are more likely to save when they had saved at age 16. In addition, saving in adulthood is not related to their receiving pocket money from parents or relatives during adolescence. However, Sansone et al. (2019) reported that Dutch adults displayed greater inflation-related knowledge and self-assessed financial literacy if they reported receiving pocket money between 8 and 12 years of age or being taught how to run a budget to save between 12 and 16. Furthermore, Grinstein-Weiss et al. (2011) found that those American adults who reported receiving money-management teaching from their parents are associated with higher credit scores and lower credit card debt in adulthood. Buccioli and Veronesi (2014) also showed that those Dutch individuals who reported parental teaching during childhood are more likely to save in adulthood, particularly when they were given pocket money with advice on saving and budgeting. However, caution is required because these studies may be subject to endogeneity issues inherent in nonrandom data as well as recall error, as people may not correctly recall experiences occurring many years ago.

Despite the limitation, this study aims to present evidence based on a large-scale Japanese survey that includes information on the respondent's parental teaching in childhood and financial education experience received at school or the workplace. The survey data make it possible to separate the roles of parental teaching distinctly from financial education at school or the workplace, while most previous studies can only focus on financial experiences on a certain platform.¹

2.1. The financial education system in Japan

The Japanese school curriculum enacted in 1951 recommended the introduction of savings promotion activities in schools through the so-called “children's banks,” in which

students can deposit and withdraw money in financial institutions through schools (Messy & Monticone, 2016). In 2006, the Ministry of Education overhauled The Basic Education Act, which stipulated the objectives of education, including “fostering a spirit of autonomy and independence, emphasizing connections to a career and practical life and developing a mindset of active contribution to the building and development of society” (OECD, 2013). Consequently, Japan revised and renewed the school course guidelines to strengthen financial education, which was implemented at elementary, junior high, and senior high schools in 2011, 2012, and 2013, respectively. However, financial education was not mandatory in the curriculum (until April 2022). In addition, financial knowledge is only provided patchily and sporadically in specific subjects, such as “Civics” in junior high school and “Social Studies” or “Politics and Economics” in high school, and with limited teaching hours. A survey of Japanese school teachers conducted from 2013 to 2014 revealed that more than a majority of teachers answered insufficient teaching hours set aside for financial knowledge, and 40% answered insufficient content (Financial Education Promotion Study Group, 2014).

In addition, financial trade bodies offer a variety of opportunities for financial education, via seminars and visiting lectures, for working adults and citizens. Such programs are more practical in nature, covering explanations of financial products, asset management, investment knowledge, family budget management, and life planning (OECD, 2013).

3. Data and variables

This study investigated whether and how financial behaviors in adulthood are associated with financial socialization in the family versus financial education at school or the workplace. Data were drawn from FLS 2016—an online survey conducted by Japan’s Central Council for Financial Services Information in 2015 to shed light on Japanese individuals’ financial knowledge, attitudes, and behaviors. The sample comprises 25,000 individuals, distributed in proportion to Japan’s demographic structure. Table 1 summarizes the results of this empirical study. The average age was 48.7 years, ranging from 18 to 79 years. Females accounted for half of the sample. By occupation, 32.2% were employed by a company, 20.9% were house workers, 15.6% were not employed, 14% were part-time workers, 7% were self-employed, 4.9% were students, and 3.5% were civil servants. By education degree, 38.6% had a college degree, followed by those with high school education (32.4%), 2-year college degree (11.29%), and vocational education (10.5%), while only 4.2% received graduate school education. Regarding household income, the largest cohort is 2.5–5 million yen annually (28.9%), followed by 5–7.5 million yen (16.6%), and up to 2.5 million yen (15.7%). Only 6.7% of the survey respondents reported a household income of more than 10 million yen (equivalent to approximately \$91,116 as of January 2020).

3.1. Variables on financial socialization or financial education

Two FLS questions in the survey are used to construct the variables. One question asks if “your parents or guardians taught you how to manage your finances,” with 19.8% of

Table 1 Descriptive statistics

Variables	No.	Mean or proportion (%)
Age	25,000	48.71
% Female	25,000	50.66
% With occupation = Company workers	25,000	32.24
Civil servant	25,000	3.51
Self-employed	25,000	6.99
Part-timers	25,000	14.03
House-work	25,000	20.90
Student	25,000	4.85
Not employed	25,000	15.64
Others	25,000	1.84
% With degree = mandatory education	25,000	2.82
High school	25,000	32.42
Vocation school	25,000	10.51
2-year college	25,000	11.29
4-year college	25,000	38.60
Graduate	25,000	4.20
Other	25,000	0.15
% With household income = 0 mil. Yen	25,000	3.60
>0 and <2.5 mil. Yen	25,000	15.70
>2.5 and <5 mil. Yen	25,000	28.90
>5 and <7.5 mil. Yen	25,000	16.64
>7.5 and <10 mil. Yen	25,000	9.68
>10 and <15 mil. Yen	25,000	5.12
>15 mil. yen	25,000	1.62
Don't know	25,000	18.75
% Receiving fin. teaching by parents only	25,000	17.04
% Receiving fin. education at school/work only	25,000	3.82
% Receiving both at home & school/work	25,000	2.76
% Receiving non at home or school/work	25,000	76.38
Carefully consider before buying (from 1 to 5)	25,000	3.94
Pay bills on time (from 1 to 5)	25,000	4.42
Keep a close eye on financial affairs (from 1 to 5)	25,000	3.65
% Have a 3-month emergency fund	25,000	54.85
Stock investment	25,000	32.64
% Estimate post-retirement expenses	25,000	49.39
% Have a plan for post-retirement expenses	14,185	35.59
% Set aside post-retirement expenses	14,185	26.04
% Correctly answered 0 question	25,000	15.22
1 question	25,000	16.19
2 questions	25,000	18.58
3 questions	25,000	20.44
4 questions	25,000	19.59
5 questions	25,000	9.99

respondents replying “yes,” 60.4% “no,” and 19.8% “don’t know.” I define those with a “yes” response as those receiving financial teaching from parents (guardians) at home in childhood. The other FLS question asks if “financial education was offered by a school or college you attended or a workplace where you were employed,” with 6.6% of respondents replying “yes,” 75.7% “no,” and 17.7% “don’t know.” I define those with a “yes” response as those receiving financial education at school or in the workplace. The relatively smaller

number epitomizes the fact that financial education has not been emphasized in the Japanese education system.

I constructed four dummy variables regarding the financial education experience. “Fin. teaching by parents only” dummy indicated those who received financial advice from parents but did not receive financial education at school/workplace. “Fin. education at school/work only” dummy indicated those who received financial education at school/workplace but not financial advising by parents. “Both at home and school/work” was defined as those receiving financial advice from parents as well as financial education at school/work. Finally, the “No fin. education” dummy was defined for the remaining respondents. The middle of Table 1 reports that 76.4% received no financial teaching at home or school or workplace, while 17% received financial teaching from parents only, 3.8% at school or work only, and 2.76% both.

3.2. Variables on financial behaviors

Following Wagner and Walstad (2019), I constructed variables for an individual’s short-term and long-term financial behaviors. These variables are based on replies to the following FLS questions. Descriptive statistics are reported in the lower part of Table 1.

3.3. Short-term financial behavior variables

1. “Before I buy something, I carefully consider whether I can afford it.” On a scale of 1 to 5, 33.8% indicated “5 = strongly agree,” 36.7% “4 = agree,” 22% “3 = neutral,” 5.3% “2 = disagree,” and 2.3% “1 = strongly disagree.” The average score was 3.9. A category variable was defined for this behavior, taking values from 1 to 5.
2. “I pay my bills on time.” On a scale of 1 to 5, 63.5% indicated “5 = strongly agree,” 21% “4 = agree,” 11.3% “3 = neutral,” 2.7% “2 = disagree,” and 1.5% “1 = strongly disagree.” The average score was 4.42. A category variable was defined by taking values from 1 to 5.
3. “I watch my financial affairs closely.” On a scale of 1 to 5, 22.5% indicated “5 = strongly agree,” 34.9% “4 = agree,” 30.4% “3 = neutral,” 8.8% “2 = disagree,” and 3.3% “1 = strongly disagree.” The average score was 3.65. A category variable was defined by taking values from 1 to 5.
4. “Have you set aside emergency funds that would cover your expenses for three months in case of sickness, job loss, economic downturn, or other emergencies?” Here, 54.9% indicated “yes,” 29.7% “no,” and 15.4% “don’t know.” A dummy variable was defined for those who indicated “yes.”

As suggested by the categorical variables, most Japanese respondents seemingly displayed a prudent financial attitude. Most respondents were also prepared for short-term financial needs.

3.4. Long-term financial behavior variables

5. “Have you ever purchased stocks?” 32.6% indicate “yes” and the remaining “no.” A dummy variable was defined for those who indicated “yes.”

6. “Are you aware of the amounts that will be required for your living expenses for retirement?” Here, 49.4% indicated “yes” and 50.6% “no.” A dummy variable was defined for those who indicated “yes.”
7. “Do you have a financial plan for the living expenses you think you will have to cover in the future?” Here, 35.6% indicated “yes” and 64.4% “no.” A dummy variable was defined for those who indicated “yes.”
8. “Have you set aside funds for the living expenses you think you will have to cover in the future?” Here, 26.0% indicated “yes” and 74% “no.” A dummy variable was defined for those who indicated “yes.”

Contrary to short-term financial behaviors, the results suggest that most Japanese respondents inadequately plan and prepare for their long-term financial needs.

3.5. Control variables

I also constructed a set of control variables that may influence one’s financial behaviors, such as age, gender, occupation, education attainment, household income, and residence area.² Another control variable is financial literacy, which has been documented to have a bearing on financial behaviors (Behrman et al., 2012; Disney & Gathergood, 2013; Klapper et al., 2013; Lusardi & Mitchell, 2007a, 2007b; Rooij et al., 2011; Yeh, 2022; Yeh & Ling, 2022). I constructed a financial literacy variable based on one’s answers to the “big-five” questions commonly used in previous studies (e.g., Despard et al., 2020; Gathergood & Weber, 2017; Ooijen & van Rooij, 2016).

1. “Suppose you put 1 million yen into a savings account with a guaranteed interest rate of 2% per year. How much would there be in the account after five years, disregarding tax deductions?”
2. “Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After one year, how much would you be able to buy with the money in this account?”
3. “True or false? Buying a single company’s stock usually provides a safer return than a stock mutual fund.”
4. “If interest rates rise, what will typically happen to bond prices?”
5. “True or false?” “When compared, a 15-year mortgage typically requires higher monthly payments than a 30-year loan, but the total interest paid over the life of the loan will be less.”

The respondents who correctly answered each of these questions were 65.7%, 55.6%, 45.8%, 24%, and 68.4%, respectively. The question on inflation and bond prices had the lowest correct rate (24%). Alternatively, as reported at the bottom of Table 2, out of these five questions, 10% of respondents correctly answered five questions, 19.6% four questions, 20.4% three questions, 18.6% two questions, and 16.2% one question. Further, 15.2% failed to answer any question correctly. I constructed a financial literacy variable that indicated the number of correct answers, ranging from zero to five.

Table 2 Financial behaviors stratified by financial education experiences

	No Fin. teaching	Fin., teaching by parents only	Fin., education at school/work only	Receiving both	All
Panel A: Short-term financial behaviors					
Variables	Mean	Mean	Mean	Mean	Mean
Carefully consider before buying	3.90	4.09	3.96	4.13	3.94
ANOVA <i>F</i> value	52.36	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Pay bills on time	4.39	4.56	4.36	4.51	4.42
ANOVA <i>F</i> value	41.81	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Keep a close eye on financial affairs	3.58	3.87	3.76	4.01	3.65
ANOVA <i>F</i> value	128.94	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Variables	Percent	Percent	Percent	Percent	Percent
Have an emergency fund	0.52	0.65	0.62	0.69	0.55
ANOVA <i>F</i> value	115	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Panel B: Long-term financial behaviors					
Variables	Percent	Percent	Percent	Percent	Percent
Stock investment	0.30	0.33	0.55	0.49	0.32
ANOVA <i>F</i> value	125.84	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Estimate post-retirement expenses	0.48	0.51	0.65	0.61	0.49
ANOVA <i>F</i> value	32.77	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Have a plan for post-retirement	0.33	0.41	0.49	0.52	0.36
ANOVA <i>F</i> value	54	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—
Set aside post-retirement expenses	0.24	0.29	0.35	0.37	0.26
ANOVA <i>F</i> value	23.67	—	—	—	—
<i>p</i> -value	0.000	—	—	—	—

Note. ANOVA stands for analysis of variance.

4. Empirical tests and results

4.1. Univariate tests

The univariate tests compare the financial behaviors among the four types of respondents stratified by their financial education experience. The results are shown in Table 2. The results of the one-way analysis of variance (ANOVA) suggest that at least two groups were significantly different in terms of financial behaviors ($p < .01$). For almost all the financial behavior variables, the “No fin. education” group performed the worst, while “Both at home and school/work” performed the best. However, for short-term financial behaviors, the “Fin.

teaching by parents only” group outperformed the “Fin. education at school/work only” group, while the opposite was true for long-term financial behaviors. For instance, 65% in the “Fin. Teaching by parents only” group have emergency (for three-month) funds compared with 62% in the “Fin. education in the school/work only” group. However, regarding “stock investment” (having retirement planning), 33% (41%) in the “Fin. teaching by parents only” group were prepared compared with 55% (49%) in the “Fin. education in the school/work only group.” The results suggest that education at home or school/work may have different implications for short-term and long-term financial behaviors. As one-way ANOVA could not determine which specific groups were statistically significantly different from each other and neither accounted for other possible factors, I performed further multivariate analyses.

4.2. Multivariate tests

In this section, I performed (ordered) probit regressions of the short-term financial behavior variables. Table 3 summarizes the (ordered) probit regression results for the four variables on short-term financial behaviors. For categorical variables (on a scale of 1 to 5), the columns report the marginal effects on the predicted probability of “5 = strongly agree” due to space limitations. Explanatory variables include the dummies for financial education experiences, using the “No fin. education” group as the reference group.

Table 3 shows that the “Fin. Teaching by parents only” and “Both at home and school/work” groups are more likely to display the four short-term financial behaviors. For instance, these two groups are 7–8.5% more likely to strongly agree with the statement “Before I buy something, I carefully consider whether I can afford it,” at a significant level ($p < .01$), relative to the “No fin. education” benchmark group. On the other hand, the “Fin. education at school/work only” group shows no significant coefficient for “carefully consider whether I can afford it” and “pay bills in time,” respectively. In the other two short-term variables, “Fin. education at school/work only” group indicates significant coefficients but with a smaller magnitude compared with the other two groups. In fact, the coefficient equality tests, reported at the bottom of Table 3, show that “Fin. Teaching by parents only” is more likely than “Fin. education at school/work only” to display the short-term behaviors at a significant level.

Table 4 reports the probit result on the long-term financial behaviors. All three groups receiving financial education were more likely than the group receiving no financial education to manifest the four long-term financial behaviors at a significant level ($p < .01$). Individuals receiving education either at school or at work have a higher likelihood than those “taught by parents only.” For instance, compared with the no-financial-education group, the “financial education at school/work only” group has a 16% higher likelihood, but the “taught by parents only” group has 2%, respectively, to have stock investment experience. The coefficient equality tests also show that the “Fin. education at school/work only” group is more likely than the “taught by parents only” group to display the short-term behaviors at a significant level.

Table 3 Average marginal effects (AME) of ordered probit regression of the short-term financial behaviors

Predicted Probability of strongly agreeing:	Carefully consider before buying		Pay bills on time		Keep a close eye on financial affairs		Have an emergency fund	
	AME	p	AME	p	AME	p	AME	p
Fin. teaching by parents only	0.071	.000	0.069	.000	0.083	.000	0.105	.000
Fin. education at school/work only	0.016	.212	-0.023	.09	0.047	.000	0.062	.000
Both at home and school/work	0.085	.000	0.055	.002	0.124	.000	0.159	.000
Fin. literacy	0.021	.000	0.044	.000	0.023	.000	0.069	.000
Female	0.014	.025	0.083	.000	0.013	.009	0.112	.000
Age	-0.002	.000	0.005	.000	0.002	.000	0.006	.000
Have loans	0.014	.015	-0.069	.000	-0.059	.000	-0.155	.000
Civil servant	-0.022	.073	-0.032	.031	0.009	.381	0.047	.003
Self-employed	0.040	.000	-0.036	.001	0.010	.223	-0.048	.000
Part-timers	0.034	.000	-0.024	.010	0.008	.211	-0.059	.000
House-work	0.031	.000	0.023	.018	0.041	.000	0.014	.161
Student	-0.013	.331	0.058	.000	0.053	.000	-0.163	.000
Not employed	0.056	.000	0.020	.043	0.034	.000	-0.021	.030
>0 and <2.5 mil. yen	0.018	.256	0.022	.161	0.034	.001	0.074	.000
>2.5 and <5 mil. yen	0.002	.879	0.067	.000	0.050	.000	0.156	.000
>5 and <7.5 mil. Yen	-0.027	.101	0.111	.000	0.058	.000	0.224	.000
>7.5 and <10 mil. Yen	-0.052	.003	0.098	.000	0.067	.000	0.256	.000
>10 and <15 mil. Yen	-0.073	.000	0.125	.000	0.080	.000	0.296	.000
>15 mil. yen	-0.140	.000	0.123	.000	0.095	.000	0.340	.000
4-year college	0.007	.229	0.009	.124	0.015	.001	0.053	.000
Graduate	0.014	.275	-0.005	.720	0.043	.000	0.092	.000
Residence areas	Yes	—	Yes	—	Yes	—	Yes	—
Wald χ^2	558.1	.000	2403	.000	1653	.000	5178.5	.000
Pseudo R^2	0.009	—	0.050	—	0.024	—	0.190	—
Coefficient equality test	χ^2	p	χ^2	p	χ^2	p	χ^2	p
By parents only = at school/work	15.3	.000	36.9	.000	10.2	.001	7.0	.008
At home and school/work = by parents only	0.7	.404	0.6	.434	10.0	.002	7.9	.005
At home and school/work = at school/work	12.4	.000	12.4	.000	24.1	.000	17.7	.000

Table 4 Average marginal effects (AME) of ordered probit regression of long-term financial behaviors

	Stock investment		Aware of retirement expenses		Have a plan		Set aside post-retirement funds	
	AME	p	AME	p	AME	p	AME	p
Fin. teaching by parents only	0.020	.005	0.064	.000	0.093	.000	0.058	.000
Fin. education at school/work only	0.163	.000	0.170	.000	0.141	.000	0.096	.000
Both at home and school/work	0.128	.000	0.161	.000	0.194	.000	0.139	.000
Financial literacy	0.075	.000	0.028	.000	0.029	.000	0.012	.000
Female	-0.069	.000	-0.013	.188	0.012	.242	0.002	.830
Age	0.005	.000	0.011	.000	0.009	.000	0.010	.000
Dummy for having loans	-0.029	.000	-0.044	.000	-0.075	.000	-0.090	.000
Civil servant	-0.039	.006	0.025	.184	0.032	.094	0.065	.000
Self-employed	-0.008	.495	-0.016	.333	-0.002	.910	0.011	.415
Part-timers	-0.042	.000	-0.015	.257	-0.004	.726	0.019	.082
House-work	-0.006	.530	0.029	.024	0.037	.004	0.096	.000
Student	-0.104	.000	-0.002	.958	-0.072	.033	0.059	.162
Not employed	-0.017	.071	0.058	.000	0.069	.000	0.114	.000
Household income <2.5 and >0 mil. Yen	0.009	.604	-0.032	.273	-0.003	.926	-0.039	.105
>2.5 and <5	0.041	.023	-0.024	.399	0.018	.534	0.024	.305
>5 and <7.5	0.073	.000	-0.015	.605	0.044	.136	0.048	.051
>7.5 and <10	0.086	.000	0.024	.431	0.091	.003	0.105	.000
>10 and <15	0.123	.000	0.044	.179	0.115	.000	0.166	.000
>15	0.150	.000	0.106	.008	0.196	.000	0.287	.000
4-year college	0.047	.000	0.011	.202	0.008	.338	0.026	.000
Graduate	0.077	.000	0.056	.003	0.073	.000	0.072	.000
Residence areas	Yes		Yes		Yes		Yes	
Wald χ^2	4592		2285.7	.000	1804.1	.000	2516.4	.000
Pseudo R^2	0.186		0.135		0.116		0.220	
Coefficient equality test								
By parents only = at school/work	95.580	.000	22.9	.000	5.6	.018	4.7	.030
At home and school/work = by parents only	42.330	.000	15.6	.000	19.2	.000	17.3	.000
At home and school/work = at school/work	3.090	.079	0.1	.779	3.6	.060	3.3	.070

Regarding the control variables, financial literacy is positively and significantly associated with all financial behaviors, which is consistent with previous studies. Females are more prudent in short-term behaviors and less likely to invest in stocks. However, females are not statistically different from males in retirement savings, probably because they may share the financial resources with their male spouses in the same household. High-earning individuals are also more financially behaved, except “carefully consider before purchase,” which makes sense as they can afford not to do so. Senior people have the same tendency as higher-earning people. Seniors may not be able to “carefully consider before purchase” as younger ones, probably due to weakening cognitive capability.

In contrast, having a loan makes one more careful in buying but is adversely associated with all other financial behaviors. Those with advanced education degrees perform better than those without in most financial behaviors. Finally, occupations appear to matter, but the coefficients are generally difficult to interpret.

In summary, the results suggest that those receiving financial teaching both at home and school/work are the best financially prepared long-term. However, unlike the case for short-term behaviors, the association is primarily attributed to financial education at school or the workplace, which is more influential than that at home.

4.3. *Instrumental variables estimation results*

One concern about including financial literacy as a control variable in studies of financial behavior is that it may be endogenous (Lusardi & Mitchell, 2014). Therefore, I use the instrumental variables (IV) method to address this concern. In existing research, instruments used for financial literacy include mathematical ability during teens (Gathergood & Weber, 2017; Jappelli & Padula, 2013), the experience of family members (Behrman et al., 2012; Rooij et al., 2011), and the number of universities or newspapers circulating in the neighborhood (Klapper et al., 2013). In this study, due to data availability, I used the number of Nikkei newspapers per household circulating in the respondent’s residing prefecture as the IV variable. Furthermore, following Bannier and Schwarz (2018) and Yeh and Ling (2022), in addition to this external instrument, I also used instruments constructed by heteroscedasticity, an estimation method developed by Lewbel (2012), when no or insufficient external instruments were available. As the Lewbel estimator is based on *linear* regression models, I only apply IV estimation for binary dependent variables. Table 5 reports the Lewbel estimates for the regressions. The first-stage regression results indicate that the external instrument is positively and significantly associated with financial literacy ($p < .01$), satisfying the exclusion restriction. The Lewbel (2012) method assumes heteroscedasticity in the errors of the first-stage regression. The White test and Breusch and Pagan test for heteroscedasticity show that the assumption of heterogeneous error terms is met. The weak instruments test results, the Cragg and Donald statistic (=15.9 and 6.4, respectively), imply that the null hypothesis of weak instruments is rejected if we are willing to tolerate a 10–20% relative bias based on critical values provided by Stock and Yogo (2005).

Table 5 Results for instrumental variables estimation method

	Have an emergency fund		Have a plan		Set aside retirement funds	
	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
Fin. teaching by parents only	0.065	0.000	0.097	0.000	0.064	0.000
Fin. education at school/work only	0.006	0.751	0.154	0.000	0.109	0.000
Both at home and school/work	0.079	0.000	0.208	0.000	0.160	0.000
Financial literacy	0.159	0.000	0.023	0.310	−0.007	0.737
Female	0.156	0.000	0.010	0.528	−0.005	0.702
Age	0.004	0.000	0.009	0.000	0.012	0.000
Dummy for having loans	−0.166	0.000	−0.082	0.000	−0.105	0.000
Civil servant	0.040	0.015	0.033	0.100	0.066	0.000
Self-employed	−0.048	0.000	−0.003	0.877	0.001	0.963
Part-timers	−0.049	0.000	−0.005	0.692	0.021	0.038
House-work	0.016	0.104	0.041	0.001	0.105	0.000
Student	−0.139	0.000	−0.012	0.549	0.145	0.000
Not employed	−0.023	0.022	0.084	0.000	0.160	0.000
Household income <2.5 and >0 mil. Yen	0.028	0.102	0.000	0.995	−0.015	0.539
>2.5 and <5	0.097	0.000	0.023	0.413	0.059	0.019
>5 and <7.5	0.156	0.000	0.045	0.136	0.070	0.009
>7.5 and <10	0.177	0.000	0.096	0.003	0.132	0.000
>10 and <15	0.214	0.000	0.124	0.000	0.198	0.000
>15	0.232	0.000	0.214	0.000	0.351	0.000
4-year college	0.011	0.295	0.011	0.453	0.036	0.004
Graduate	0.025	0.199	0.079	0.004	0.082	0.000
Residence areas	Yes	—	Yes	—	Yes	—
Constant	−0.169	0.000	−0.216	0.000	−0.438	0.000
First-stage regression of financial literacy	Coef.	<i>p</i>	Coef.	<i>p</i>	Coef.	<i>p</i>
IV: Nikkei newspaper circulation	0.034	0.002	0.048	0.001	0.048	0.001
No.	25000	—	14185	—	14185	—
Underidentification test						
Kleibergen-Paap rk LM statistic	207.6	0.000	88.1	0.000	88.1	0.000
Weak identification test						
Cragg-Donald Wald <i>F</i> statistic	15.943	—	6.433	—	6.433	—
Heteroskedasticity tests						
White/Koenker nR^2 test statistic	356.3	0.000	133.3	0.000	133.3	0.000
Breusch-Pagan/Godfrey/Cook-Weisberg	248.8	0.000	96.9	0.000	96.9	0.000
Coefficient equality test	χ^2	<i>p</i>				
By parents only = at school/work	13.4	0.000	6.3	0.012	5.0	0.026
At home and school/work = by parents only	0.5	0.461	19.1	0.000	17.7	0.000
At home and school/work = at school/work	11.5	0.001	3.3	0.070	3.7	0.056

Note. The results are based on Lewbel's IV estimation method, using the dummy for receiving education at home as the external instrument. Regressions are estimated using the heteroskedasticity-robust standard errors. All regressions include residence dummies (not reported).

*Stock-Yogo weak ID test critical values for 10% maximal IV relative bias 11.3; 20% maximal IV relative bias 6.08; 30% maximal IV relative bias 4.28.

Column 1 of Table 5 reports the IV estimates for the short-term behavior “have an emergency fund.” The results are similar to those in Table 3, but the coefficient for “Fin. education at school/work only” is no longer significant ($p = .751$). The conclusion remains unchanged that short-term behaviors are primarily associated with parenting teaching at home.

In Table 5, columns 2 and 3 report the IV estimates for the long-term behavior “having a financial plan for retirement” and “setting aside funds,” respectively. The results are similar to those in Table 4. In both columns, the coefficient for “Fin. education at school/work only” is significantly larger than “Fin. Teaching by parents only” ($p < .05$), suggesting that long-term financial behaviors are primarily associated with financial education at school/work.

The IV method results for the control variables remain similar to the preceding analyses, except for financial literacy—in columns 2 and 3, financial literacy variables are no longer significant. Probably, the effect of financial literacy is now captured by financial education variables in the IV estimation. However, the results regarding financial education remain unchanged.

4.4. Matching method results

Whether one receives financial teaching from parents or school can also be related to socio-economic factors of the individual’s family background, such as wealth or parents’ educational attainment. The preceding regression specifications address this possibility by including various control variables available from the survey data. This section provides additional tests by matching each individual who received financial teaching with a “control” individual with similar characteristics but without financial teaching by parents or school/workplace. The matching is based on having the same gender, financial literacy scores, age cohort, occupation cohorts, household income cohorts, and education degrees without placement.³ Subsequently, I rerun the tests, as in Tables 3–4, by using a sample of the treatment and control groups.

Table 6 reports the marginal effect results for regressions using individuals receiving financial teaching by parents only (treatment group) and their control peers receiving no financial teaching. In the treatment group, 3,399 individuals (95.9%) were matched with a control peer, while 146 (4.1%) failed to find a match. In all columns, the marginal effects of financial teaching by parents are statistically significant ($p < .01$) and are close in magnitude to those reported in Tables 3–4.

Table 7 reports the marginal effect results for regressions using individuals receiving financial education at school/work only (treatment group) and their control peers. In the treatment group, 820 individuals (97.9%) were matched with a control peer, and only 18 (2.1%) failed to find a match. For short-term financial behaviors (columns 1–4), the marginal effect of financial education is only significant for one variable—“watching financial affairs closely.” However, the marginal effects of financial education are significant for long-term financial behaviors with a greater magnitude. For instance, for the “stock investment” experience variable, financial education at home/workplace has a marginal effect of 15.5%, more significant than the corresponding 2.7% reported in Table 6, suggesting a more critical role of financial education at school/work in the long-term financial behaviors.

Table 6 Propensity score matching analysis for the treatment group that received fin. teaching by parents only versus control group that received none

Dependent variable:	Carefully con- sider before buying	Pay bills on time	Keep a close eye on financial affairs	Have an emer- gency fund	Stock investment	Have a plan	Set aside retire- ment funds
	Mean.	Mean.	Mean.	Mean.	Mean	Mean.	Mean.
Matched control group	3.906	4.448	3.609	0.575	0.324	0.330	0.232
Fin. teaching by parents only	4.098	4.540	3.866	0.666	0.350	0.410	0.281
<i>p</i> -value for <i>t</i> test of difference	0.000	0.000	0.000	0.000	0.024	0.000	0.000

	Ordered probit		Ordered probit		Ordered probit		Probit		Probit	
	AME	<i>p</i>	AME	<i>p</i>	AME	<i>p</i>	AME	<i>p</i>	AME	<i>p</i>
Predicted probability of strongly agree on the statement	0.081	.000	0.053	.000	0.087	.000				
Fin. teaching by parents Controls	Yes	6,798	Yes	6,798	Yes	6,798	0.092	.000	0.027	.008
No.	181	.000	547.5	.000	407.5	.000	6,798	.000	6,798	.000
Wald χ^2							1287	.000	1209	.000
Pseudo R^2	0.010	—	0.044	—	0.022	—	0.179	—	0.179	—
							Yes	Yes	Yes	Yes
							4,129	.000	4,129	.000
							714	.000	714	.000
							0.118	—	0.232	—

Note. AME = average marginal effects.

Table 7 Propensity score matching analysis for treatment group that received fin. education at school/work only versus control group that received none

Dependent variable:	Carefully con- sider before buying	Pay bills on time	Keep a close eye on financial affairs	Have an emer- gency fund	Stock investment	Have a plan	Set aside retire- ment funds
	Mean.	Mean.	Mean.	Mean.	Mean.	Mean.	Mean.
Matched control group	3.890	4.438	3.640	0.598	0.4134	0.367	0.263
Fin. education group	3.963	4.335	3.768	0.620	0.5695	0.503	0.349
<i>p</i> -value for <i>t</i> test of difference	0.141	0.023	0.011	0.363	0.000	0.000	0.004
	Ordered probit	Ordered probit	Ordered probit	Probit	AME	AME	AME
	<i>p</i>	<i>p</i>	<i>p</i>	AME	<i>p</i>	<i>p</i>	<i>p</i>
Predicted probability	0.032	.097	0.045	.005	0.028	.191	0.132
Strongly agree	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fin. education dummy	1640	1640	1640	1640	1640	952	952
Controls	47.0	.001	104.2	.000	351.0	.000	145.1
No.	0.010	—	0.024	—	0.181	—	0.129
Wald χ^2	—	—	—	—	—	—	—
Pseudo R^2	—	—	—	—	—	—	—

Note. AME = average marginal effects.

4.5. *Subsample test results*

The effect of financial education may vary according to an individual's socioeconomic background. Following Wagner and Walstad (2019), the last robustness check divides the sample into high and low groups for two control variables to investigate whether the results found until now still hold for the subsample group. The sample is divided by household income (below 750 million yen vs. above) and household financial wealth (below 750 million yen vs. above). For each subsample group, the (ordered) probit regressions were performed, as shown in Tables 3 and 4. The untabulated results remain qualitatively similar to the full sample.

5. Discussion

Analyzing a representative sample of 25,000 Japanese individuals, the empirical studies revealed that short-term financial behaviors in adulthood are primarily related to financial education received within the family. In contrast, long-term financial behaviors are related to financial teaching received at school or the workplace and, to a lesser extent, at home.

The results can be explained using the developmental framework suggested by CFPB. It is plausible that short-term financial behavior is shaped within the family as children develop sound financial values and attitudes from direct and indirect socialization with family members, particularly parents, leading to behaviors such as paying bills on time. Such socialization and experiences within the family can also strengthen executive functions, resulting in behaviors such as careful consideration when making a purchase, delaying gratification, and closely watching one's financial affairs. Financial teaching in the family is effective because parents can provide timely negative feedback or punishment when children deviate from these practices. Such experiences can influence one's attitude or behavior when turning into adulthood, as suggested by studies by Lusardi et al. (2010) and Van Campenhout (2015).

In contrast, financial education delivered at school or the workplace may be, in general, aimed at improving knowledge of personal finances and budgeting skills, which are an instrument in long-term financial behaviors such as retirement planning and saving, and home buying and homeownership (Fox et al., 2005). Even if education at school or workplace covers short-term financial behaviors, schoolteachers and instructors may not be able to provide regular and immediate feedback, particularly if good practices are not followed, as parents or family members do. The results are consistent with those of Wagner and Walstad (2019) and Bayer et al. (2009).

Financial teaching by parents can still contribute to long-term financial behaviors but to a lesser extent than that at schools or workplaces. The weaker association may be due to the more complex tasks and advanced financial knowledge required for long-term planning, which is better served by later-stage financial education in schools or workplaces.

A comparison of Japan and other advanced countries can further shed insights. In fact, Japan reported lower self-reported parental and school/workplace financial education responses than the United States and Dutch, where many previous related studies are

available. For example, the proportion of Dutch who were taught by their parents how to manage a budget is 77.4% (out of 2,676 individuals), as reported by Sansone et al. (2019). It is higher than the 17.8% in Japan (this study). The proportion of the U.S. sample reported by Grinstein-Weiss et al. (2011) is about 70% (out of 2,389 individuals). In addition, Wagner and Walstad (2019) reported that 23% (out of 24,729 U.S. sample) receive financial education either at school or workplace, while the proportion in Japan (this study) is no more than 7%.

Not surprisingly, Japanese individuals also have lower financial literacy than other developed countries. For instance, for a set of comparable financial literacy questions, Japanese respondents reported a correct rate of 58%, lower than Germany of 67% and the United States of 65% (Central Council for Financial Services Information, 2016). Furthermore, compared with other developed countries, the Japanese hold a lower proportion of stocks in their financial assets. According to OECD's Household financial assets data, in 2015, among the G7 countries, Japanese households held the lowest percentage, at 8.9%, of shares and other equity in their financial assets, against 30.3% of the United States, in terms of 2005–2015 average.⁴

The situation of low exposure to financial education in Japan hardly changed. The more recent Japanese Financial Literacy Survey results done in the year 2019, published recently, compiled that 20.3% received parental teaching, as compared with 19.8% in the 2016 survey of this study, and 8.9% received financial education at the workplace/school, as compared with 8.4% in 2016 (Central Council for Financial Services Information, 2019).

One possible reason for low financial literacy and education is the life-long employment, which may be starting to change somewhat, but has remained a norm in the past decades. Until recently, employees have been automatically enrolled in a defined-benefit pension scheme, under which they do not need to work out financial matters by themselves. Only in the recent decade have some Japanese companies started to shift to a defined contribution scheme gradually. Another reason may be due to the limited coverage and teaching hours in the Japanese school curriculum, as described in the literature review section. Given the circumstances, it is imperative to strengthen financial education programs targeted at parents, school students, and employees in Japan.

5.1. Limitations

This study analyses self-reported data from FLS questionnaires. Since the respondents' financial education experiences were not strictly assigned in a random manner, it is not possible to claim a rigorously causal relationship. I used the IV and matching method to address this concern, but they may not completely solve the endogeneity issue. However, even if endogeneity might explain the positive association between financial education and financial behaviors, it seems less plausible as an explanation for the largely insignificant effects of financial education at school/workplace on short-term financial behaviors. Nonetheless, I used more cautionary wording when describing the results.

Omitted variable problems may also exist. Although parental advising is out of the control of the children, whether parents provide financial teaching may be related to factors such as

family background (Tang et al., 2015) that might be associated with the children's financial behaviors in their adulthood. Empirical tests of this study cannot account for such family background factors as the survey do not contain such information.

The survey data used in this study may entail recall error, as respondents were asked to recall their financial education experiences which can date back a long time ago.⁵ Although not being able to address the concern completely, I conducted a robust check by running the primary tests on a subset of samples aged below 30, who may be subject to recall errors to a lesser extent. The conclusion remains unaltered. Nonetheless, caution is necessary when interpreting the results as recall errors cannot be totally ruled out.

Another limitation is that the FLS did not reveal what kind of financial education was offered, although such knowledge can better contribute to understanding the relationship between financial education and behavior. Future research may address this issue by obtaining detailed information on the types and intensities of the educational activities.

5.2. Implications

Despite the limitations, the results of this study have several implications. The results illuminate the importance of financial education within the family, which appears to have a strong association with financial behavior into adulthood. It is useful for public or private educational or financial institutions to provide advice or training programs targeted at parents regarding how to communicate financial advice effectively so that children can develop proper financial attitudes and habits during daily life opportunities.

Another insight from this study is the importance of cumulative financial education. This suggests that financial education has an accumulative impact. To promote financial education, educational policymakers may adopt a more integrative design that incorporates programs designed at different stages of life. Educational programs should be designed with distinct objectives, with earlier stage programs focusing more on short-term financial behaviors (e.g., executive functions and proper financial attitudes and habits) and later-stage programs emphasizing long-term behaviors (e.g., knowledge and skills for asset management and retirement saving). Individuals should be encouraged and provided opportunities to receive accumulative financial education at different stages of life, as it is the most effective way to influence financial behavior.

Notes

- 1 One exception is Wagner and Walstad (2019), which isolated financial education received at high schools, colleges, and workplaces.
- 2 The residence area dummies are Kyushu (prefectures of Fukuoka, Kagoshima, Kumamoto, Miyazaki, Nagasaki, Oita, Okinawa, and Saga), Shikoku (Ehime, Kagawa, Kochi, and Tokushima), Chugoku (Hiroshima, Okayama, Shimane, Tottori, and Yamaguchi), Keihan (Kyoto, Osaka), Kinki (Hyogo, Nara, Shiga, and Wakayama), Chubu (Aichi, Fukui, Gifu, Ishii, Mie, Nagano, Niigata, Shizuoka, and

Toyama), Tokyo, Kanto (Chiba, Gunma, Ibaragi, Kanagawa, Saitama, Tochigi, and Yamanashi), and Tohoku (Akita, Aomori, Fukushima, Hokkaido, Iwate, Miyagi, and Yamagata).

- 3 The results remain qualitatively similar when multiple matches are allowed, with replacements, using the nearest-neighbor criteria.
- 4 <https://data.oecd.org/hha/household-financial-assets.htm>
- 5 I am grateful to the referees for suggesting some of the limitations.

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