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Financial capability across generations and technology

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Abstract

Financial capability is critical for individuals to survive economic hardship. As the first attempt in the literature, our research explores how being technology savvy is relevant in explaining individuals' short-term and long-term financial behavior. Specifically, we use the 2018 National Financial Capability Study (NFCS) to uncover the mixed roles of technology in personal financial management. Being technology savvy was consistently associated with less desired short-term financial behavior while positively related to good long-term financial behavior after controlling for individual financial constraints and other socio-economic variables. Moreover, our study demonstrates the generational disparity of being technology savvy related to financial behavior.

JEL classifications: G5 Household Finance

Keywords: Financial capability; Tech-savvy; Generational disparity

1. Introduction

Financial literacy has never been more critical to people in today's complex financial world as essential as basic reading and writing skills. Financially literate participants in the labor market better understand overall economic performance and react more wisely during economically challenging times. Inadequately financially literate individuals are closely associated with personal finance issues such as low savings rates, over-indebtedness, and poor financial decisions (Lusardi & Mitchell, 2014). The rising college tuition and costs,

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together with unprecedented increases in student loan debt, $1.59 trillion as of July 2021, have disproportionately burdened young people more than previous generations (Federal Student Act Q2, 2009).

Enabled by technological innovation, the decision-making process on personal finance matters becomes even more complex when the social and economic landscapes are dramatically changed. With the evolution of internet technology and the popularity of mobile devices, how people save, spend, invest and manage cash, how individuals participate in the labor market, along with how people communicate and exchange information on personal finance matters, have experienced unprecedented transformations. In 2021, 82% of Americans have used at least one type of digital payment, defined as including browser-based or in-app online purchases, in-store checkout using a mobile phone and/or QR code, and person-to-person (P2P) payments, compared with 78% in 2020 and 72% in 2016 (McKinsey Digital Payments Consumer Survey, 2021). Additionally, the penetration of new forms of financing options, such as BNPL (Buy Now Pay Later), has been credited for incremental spending on certain sectors and the emergence of cryptocurrency and digital transformation in financial services have embarked opportunities and challenges on individuals' financial investments.[1] Moreover, new technologies, defined as automation, digital technologies, and machine learning (Dell & Nestoriak, 2020), are making profound implications on the labor market outcomes such as the income distribution of workers from different occupations as well as relative return to capital compared with labor, which in turn affects the financial well-being of individuals.

Addressing the question of how Americans feel in their financial lives requires a holistic approach with present and future-oriented views: not only whether individuals are able to meet current financial obligations and spending needs, but also how they invest and prepare to respond to financial shocks and achieve financial success in the future. As integrated into the synthesis of financial literacy concepts, financial capability, that is, how well people manage their money and control their finances, is revealed by their evolving financial behaviors and outcomes in the fast-growing digital world. Plus, researchers have suggested the generational disparity of perceived value and experience in using technology (Dhanapal et al., 2015; Kumar & Lim, 2008) and indicated age as an important factor in technology acceptance and mobile payments (Liébana-Cabanillas et al., 2014; Phang et al., 2006) that in turn have impacts in household wealth and financial well-being.

The purpose of this study is to examine the role and generational disparity of being tech-savvy on short-term and long-term personal financial capability, and how the effect varies across generations. The main contributions of this study are the following: first, using the 2018 National Financial Capability Survey (NFCS), our findings on the mixed roles of being tech-savvy in personal financial management contribute to the literature as the first study on this attempt. By using overall and individual metrics to describe the extent of being tech-savvy, we find being tech-savvy is consistently associated with less desired short-term financial behavior. However, the tech-savvy variable is positively associated with good short-term financial behavior. This could indicate that technology allows risk-tolerant individuals to behave imprudently in short-term financial matters. However, individuals may engage in more rational long-term financial behavior using technology.

Second, financial capability and technology savviness can vary across generations. Among four generations, that is, iGen/Gen Z (born between 1994 and 2000), millennials/

GenY (born between 1993 and 1984), Gen X (born between 1983 and 1964), and baby boomers (born before 1964), being equipped with good financial knowledge favors Gen Z and baby boomers to engage in good short-term financial behavior. More interestingly, being financially confident is positively associated with good short-term financial behavior across all generations. Technology acceptance also has different implications on financial behavior across various age groups. The Tech-savvy variable is found to be negative and significant across all generations in the logit regression of short-term financial behavior, meaning being tech-savvy has an adverse effect on short-term financial behavior. The marginal coefficients are highest for iGen and baby boomers with −5.9% and −8.87%, respectively. This could indicate that those in the youngest generations and oldest generations are not using technology in a way that would benefit their money management in the short term. Moreover, tech-savvy individuals in Gen Z, Millennials, and Gen X are more likely to engage in good long-term financial behavior with marginal coefficients for being tech-savvy 7.2%, 5.9%, and 3.6%, respectively.

The rest of the paper is organized as follows: Section II provides an overview of existing studies; Section III introduces the 2018 National Financial Capability Survey (NFCS); empirical results are discussed in Section IV; Section V presents robustness checks, and Section VI concludes with a discussion on future research.

2. Literature review

Financial decisions have profound impacts on an individual's financial well-being. Enabled by technological innovations, the decision-making on personal finance matters becomes even more complex in a fast-changing social and economic landscape. Recent literature on the impacts of digitalization on personal financial capability has focused on three areas: consumer behavior, online financial service, and digital adoptions relevant to work tasks. A line of research has examined the technological implication on financial capability through consumer's online shopping and other consumer-credit digital transactions, such as in-game purchases, which in turn were linked to high-cost debts (Carlsson et al. 2017; Garrett et al. 2014). Additionally, individuals are increasingly adopting online financial services such as mobile banking, fund transfers, bill payments, and cash management. Hee Yeo and Fisher (2017) reports more frequent use of online financial service is associated with a high level of financial capability.

Technological advancement has not only transformed individual behavior in communication, consumption, and social interaction, but also provided a unique opportunity to complement traditional avenues to acquire financial literacy and manage personal financial matters. The Federal Reserve Board (2016) indicates that mobile phone usage is higher among younger groups, with the same trends in smartphone usage. Prior research has documented both positive and negative effects of technology adoption on personal use. Using technology in social networks increases self-esteem but reduces self-control and self-regulation ability (Wilcox & Stephen, 2012). Chan and Saqib (2015) report that using online social networking services increases financial risk-taking. Carlsson et al. (2017) suggest that as the use of

the internet and mobile use increases, policymakers need to be aware of the consequences of digital measurability. They suggest that purchases are integrated into digital games targeting children. They also examine the increase in payment forms with installment options or unsecured loans. This provides consumers with more complex financial decisions on purchasing and taking on credit. Hee Yeo and Fisher (2017) recommend that an increased frequency of using a mobile phone for financial services is associated with a greater likelihood of having better money management skills and higher levels of financial capability. De Meza et al. (2008) state that the increasing use and adoption of mobile technologies could help individuals manage their finances better. Hogarth and Anguelov (2004) report that families using phone banking and computer banking contribute to higher levels of financial management, with the use of computer banking having the largest impact. E-banking can be an additional tool that compliments other financial management skills rather than e-banking being the sole driver of better financial management. Walsh and Lim (2020) study millennials' financial behavior and finds heavy technology adopters tend to be more likely to engage in positive financial behavior such as setting up emergency funds, retirement and investment accounts and less-desired financial behavior of overspending. In our paper, the variable tech-savvy includes both mobile and web app users. We also break down the tech-savvy variable by specific metrics in responses to survey questions: how often individuals used their phone to pay for a product or service in person, and how often individuals transfer money on a mobile phone.

Part of our research investigates how using technology affects different generations' financial behavior in the short-term and long-term. Mobile use for transfers is negatively and significantly associated with good short-term financial behavior of Gen X, and baby boomers. Those earlier generations who use technology for mobile transfers are 4.0% to 6.7% less likely to engage in good short-term financial behavior. Additionally, the tech-savvy variable positively and significantly relates to the good long-term financial behavior of iGen/GenZ, Millennials/GenY, and GenX, while the tech-savvy variable is insignificant for the baby boomers. Prior research has examined the relationship between age and technology. For example, Liébana-Cabanillas et al. (2014) suggest that the age of the technology user plays a significant role in trusting and using mobile payment systems. Younger users are less affected by acceptance problems while older users have less trust in mobile payment systems. Regarding cultural dominance, Gen X falls short in the digital category (Visual Capitalist, 2021). Shobha and Kumar (2020) find that different generations have different perspectives on life, and so too is their personal financial behavior. Their research focuses on the financial behaviors between Generation X and Generation Y. They find that Gen X has a high score on Financial Literacy, Propensity to Planning, and Financial Risk Tolerance, in comparison with Gen Y. Gen X also has more established long-term financial behavior. Their study reports that Gen X has aligned their investment pattern with their investment objectives, including long-term investments. Kumar and Lim (2008) suggest that baby boomers utilize mobile phones for a more functional and utilitarian reason in comparison with other generations. Similarly, Berraies et al. (2017) indicate that baby boomers put an emphasis on monetary and quality values when deciding their trust toward mobile financial use.

When determining short-term and long-term financial behaviors, we follow an approach similar to Wagner and Walstad (2019). Short-term financial behaviors involve money and credit activities that provide quick and consistent feedback. These behaviors can then be changed as a result of this feedback to attempt to avoid penalties. Long-term financial behaviors require more planning with less timely feedback (Wagner & Walstad, 2019). These behaviors involve planning and thinking about the future. As a contribution to this literature, our paper examines how being tech-savvy is relevant in explaining short- and long-term financial behavior. Additionally, we try to understand how the relevancy varies across generations.

3. Data

The data for this study came from the 2018 National Financial Capability Study (NFCS). The largest component of the NFCS, the State-by-State Survey, was conducted across a large and diverse sample that provided a comprehensive analysis of the financial capability of the national population as a whole. The survey was conducted online from June through October 2018 among a nationally representative sample of 27,091. The final sample used for this study is 19,725 after dropping the observations where the respondent chose "prefer not to say" or "don't know" to the questions about financial behaviors and management. However, an answer of "prefer not to say" or "don't know" is coded as incorrect in the case of the objective financial knowledge questions.[2]

The survey questionnaires were divided into 10 sessions: (1) Demographics, (2) Financial attitudes and behaviors, (3) Banking, (4) Retirement accounts, (5) Government benefits, (6) Home and Mortgages, (7) Credit cards, (8) Other debts, (9) Insurance, and (10) Self-Assessment and literacy. Table 1 provides descriptive statistics on the demographic characteristics of the full sample. The sample contained about 46% male, 56% married, 26% single, 13% divorced or separated, and 5% widowed. As for education, around 16% had a high school diploma, 33% had some college education, about 23% had a college degree only, and 15% had some post-graduate education. About 74% of the sample were White, about 7% were self-employed, and 3% were looking for a job that is, unemployed. About one-third of the sample earned annual income below $75,000, and about 22% of the sample were making more than $100,000 a year.

To incorporate the generational differences in the adoption and use of technology, the sample is grouped into four age groups. The youngest adult group in the sample belongs to Gen Z, who were born between 1994 and 2000. Millennials or Gen Y are those born between 1993 and 1984, the youngest being 25 years old and the oldest being 34 years old as of 2018. Those who were born between 1983 and 1964 belong to the Gen X generation, the youngest being 35 years and the oldest being 54 years old. The oldest generation in our sample is baby boomers who were at least 55 years old as of 2018.[3] The generational composition of our sample is as follows, about 7% Gen Z, 16% Millennials or Gen Y, 35% Gen X, and 43% baby boomers.

Table 1 also breaks the sample into two groups, tech-savvy respondents and non-tech–savvy respondents. A two-sample t test is used to determine if there is a significant

Table 1 Descriptive statistics of demographic variables

Variables	Full sample		Tech-savvy = 1		Tech-savvy = 0		*T* test	
	N = 19,725		*N* = 6,924		*N* = 12,801		Ho: Diff = 0	
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Stat.	*p*-value
Male	0.459	0.498	0.483	0.4997	0.447	0.4971	−4.9508	0.000
Age group/generation								
GenZ/iGen (18–24)	0.0672	0.250	0.123	0.3280	0.037	0.1894	−23.1562	0.000
GenY/millennials (25–34)	0.1578	0.365	0.285	0.4514	0.089	0.2847	−37.2847	0.000
GenX (35–54)	0.35	0.384	0.237	0.4255	0.130	0.3359	−19.5213	0.000
Baby boomer (55+)	0.4278	0.495	0.180	0.3841	0.562	0.4962	55.6886	0.000
White	0.7681	0.422	0.658	0.4744	0.828	0.3777	27.4425	0.000
High school graduates only	0.1615	0.368	0.127	0.3326	0.180	0.3845	9.8077	0.000
Some college education (including associate)	0.3264	0.468	0.339	0.4732	0.320	0.4665	−2.6532	0.008
Bachelor degree only	0.2347	0.424	0.255	0.4359	0.224	0.4167	−4.9696	0.000
Post-graduate education	0.1524	0.359	0.157	0.3637	0.150	0.3571	−1.279	0.201
Married	0.5618	0.496	0.529	0.4992	0.580	0.4936	6.9257	0.000
Single	0.258	0.438	0.345	0.4755	0.211	0.4079	−20.8397	0.000
Separated or divorced	0.1335	0.340	0.106	0.3082	0.148	0.3555	8.2996	0.000
Widowed or widower	0.0466	0.211	0.020	0.1393	0.061	0.2395	13.1937	0.000
Household income range:								
Less than 25K	0.1723	0.378	0.146	0.3533	0.186	0.3895	7.1642	0.000
$25K–$50K	0.2491	0.433	0.239	0.4265	0.255	0.4357	2.4247	0.015
$50K–$75K	0.204	0.403	0.201	0.4008	0.206	0.4042	0.773	0.440
$75K–$100K	0.153	0.360	0.172	0.3770	0.143	0.3500	−5.3328	0.000
$100K and more	0.2214	0.415	0.242	0.4284	0.210	0.4075	−5.1666	0.000
Unemployed	0.0343	0.182	0.033	0.1781	0.035	0.1842	0.8722	0.383

Table 2 Short-term and long-term financial behavior

	Responses			
	Yes		No	
	Index = 1		Index = 0	
	N	%	*N*	%
Short-term financial behavior				
Always paid credit card bill in full	9,476	48.0	10,249	52.0
Spent less or equal to income	16,063	81.4	3,662	18.6
Not overdraft checking account	15,477	78.5	4,248	21.5
Overall short-term variable	7,639	38.7	12,086	61.3
Long-term financial behavior				
Has saving account	15,672	79.5	4,053	20.5
Has investments (non-retirement)	7,600	38.5	12,125	61.5
Figured out retirement needs	12,544	63.6	7,181	36.4
Has retirement plan	14,144	71.7	5,581	28.3
Had emergency fund	10,950	51.5	8,775	44.5
Overall long-term variable	11,939	60.5	7,786	39.5

difference between the means of the two groups. The results show that the mean of the majority of the variables, listed in Table 1, are significantly different.

We computed two measures of financial behavior: short term and long term. The short-term financial behavior involves money or credit management behavior that includes timely payments of bills each month, managing checking accounts to avoid overdrafts, paying off credit card balances, and making timely payments to mortgages. The long-term financial behavior is reflected by saving and investment (retirement and non-retirement) decisions that normally require long-term planning (Asaad 2015; Wagner & Walstad, 2019). In this paper, the short-term financial behavior variable is created based on the individual and aggregate responses to the three survey questions that asked if the respondent: (1) always paid off a credit card bill in full, (2) spent less than or equal to his or her income, and (3) overdrew his or her checking account occasionally. If the respondent answered "yes" to each of the questions, a separate individual measure of short-term financial behavior is coded "1," and otherwise "0." The overall measure of short-term financial behavior is constructed by adding the three individual measures with an average of 2.05. A binary dependent variable of short-term financial behavior—is created and assigned "1" if the overall measure is above the average, 2.05; otherwise, "0." That means if the respondents claimed yes to all three of these behaviors, they were assumed to have good or strong short-term financial behavior. Alternatively, each of the three individual measures is used separately as a measure of short-term financial behavior. As reported in Table 2, about 79% of the respondents had never over drafted their checking account, 81% spent less than or equal to their income over the past year, and 48% always paid their credit card bill in full. About 39% of the respondents were engaged in all three behaviors.

Some financial decisions are complex, future-oriented, and require planning (Beverly et al., 2003). An individual long-term financial behavior measure was created based on the individual and aggregate responses to the five questions that asked if the respondent: (1) had an emergency or rainy day fund; (2) had a saving account, money market account or CDs;

(3) had investments in stocks, bonds, mutual funds, or other securities that are outside of retirement accounts; (4) had ever tried to figure out their retirement needs; and (5) had any retirement plans either through an employer or not. Each of the above measures is coded "1" for yes and "0" for no. The overall measure of long-term financial behavior is created by adding the five individual measures, with an average of 2.76. A binary dependent variable of long-term financial behavior is created and coded as "1" if the overall measure is 3 or more, and "0" otherwise. As indicated in Table 2, about 61% of the respondents claimed at least three areas of long-term financial behavior. Each response to the five questions is also used as an alternative measure of long-term financial behavior. About 80% of the respondents have a saving account, money market account, or CDs; 39% of them invested either in stocks, bonds, mutual funds or other securities, not including retirement accounts; 72% had a retirement plan either from an employer or some other way, and 64% had already figured out their retirement needs. About 52% of the respondents had an emergency or rainy-day fund that would cover expenses for three months in case of sickness, job loss, economic downturn, or other emergencies.

Consistent with the existing literature (Asaad, 2015; Wagner & Walstad, 2019; Xiao & Porto, 2017), financial literacy variables are defined separately to reflect the actual knowledge and the perceived knowledge of basic financial literacy. The objective or actual financial knowledge variable is derived from responses to questions about interest accrual, inflation, bond prices, mortgage, risk, and bond duration.[4] Similarly, the subjective or perceived knowledge of financial literacy, that is, financial confidence, is constructed based on the responses to three survey questions that assess how the respondents were satisfied with their personal financial condition, rate their overall financial knowledge, and their day-to-day financial matters.[5]

One of the main contributions of this paper is examining the role of technology on financial behavior. Technology has dramatically changed the way people handle personal financial transactions, everything from online and mobile banking and virtual wallets to barcode-based mobile payments and cryptocurrencies. In addition, the ease of communication has allowed remote and contract workers to work on their own terms, increasing the size of the workforce in the gig economy. The emergence of the gig economy forced people to use various online applications such as InstaCart and DoorDash for grocery and meal delivery, and rideshare apps such as Uber and Lyft. Even if there is no consensus as to who qualifies as a gig worker, the Bureau of Labor Statistics estimated that there were 55 million gig economy workers in the nation in 2017. In our regression, we control how comfortable people are in using and adopting technology for managing their finances and defined them as tech-savvy. Four items are selected from the 2018 NFCS survey and recoded as binary variable to measure tech-savvy: (1) how often respondents used their mobile phone to pay for a product or service in person at a store, gas station, or restaurant; (2) how often do respondents used mobile phone to transfer money to another person; (3) how often they used websites or apps to help with financial tasks such as budgeting, saving or credit management, such as Credit Karma or GoodBudget; and (4) how often they took on a work assignment through a website or mobile apps such as Uber. If the respondents answered "frequently" or "sometimes" for each of the above four questions, the corresponding variables—Mobile use in person, Mobile use for transfer, Web and App for personal use, and Web and App use for work—are

Table 3 Logistic regression predicting a measure of overall short-term financial behavior

Variables	Short-term financial behavior					
	(1)	(2)	(3)	(4)	(5)	(6)
Financial knowledge	0.0696***		0.0520***	0.0243**	0.0226**	0.0229**
	(0.00648)		(0.00633)	(0.00972)	(0.00969)	(0.00966)
Financial confidence		0.200***	0.196***	0.170***	0.169***	0.168***
		(0.00556)	(0.00559)	(0.00881)	(0.00879)	(0.00878)
Financial Knowledge* Confidence				0.0454***	0.0430***	0.0414***
				(0.0121)	(0.0121)	(0.0121)
Tech-savvy					−0.0640***	
					(0.00658)	
Mobile use in person						−0.0129*
						(0.00727)
Mobile use for transfer						−0.0495***
						(0.00717)
Web and app for personal use						−0.0415***
						(0.00662)
Web and app use for work						0.00670
						(0.0104)
Pseudo R^2	0.227	0.262	0,264	0.265	0.268	0.271
Observations	19,725	19,725	19,725	19,725	19,725	19,725

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

separately coded as "1," otherwise "0." In addition, we constructed the overall measure of tech-savvy by horizontally adding all the above four measures, and coded as "1" if respondents were affirming at least two of the four questions.

4. Empirical results

Logistic regressions were used to explore how the usage and adoption of technology affects personal financial behaviors. Tables 3 through 6 show the estimated average marginal effects in which the dependent variable measured short-term financial behaviors, long-term financial behaviors, and individual measures of either behavior. As reported in Table 3, financial knowledge and financial confidence variables are positive and significant when either one of these two variables, or both together, or the interaction term were controlled. Individuals with good financial knowledge are 2.3% to 6.7% more likely to engage in good short-term financial behavior.

Those individuals with high confidence in their financial knowledge are 17% to 20% more likely to engage in good short-term financial behavior. This means that those who are confident in their financial knowledge have better financial behavior than those who only have financial knowledge. This is consistent with Henager and Cude (2016), who found that individuals with greater confidence had better financial behavior. Individuals with both high confidence and knowledge are about 4.5% more likely to engage in good short-term

financial behaviors. As indicated in Table 3, the tech-savvy variable is negatively associated with good short-term financial behavior. That means being tech-savvy becomes more of a distraction, and may lead to poor management of personal finance. When examining the individual measures of tech-savvy variables, we find mobile use in person, mobile use for transfer, and web and app for personal use are negative and significant. Individuals who use their mobile phone for personal use are 1.3% less likely to engage in good short-term financial behavior, with mobile use for transfers at 5% and web and app for personal use at 4.2%. Using mobile phones could trigger over spending because of pop-up ads by impulsive online purchases for convenience.

Table 4 below shows the result of the logistic regression when the dependent variables are individual measures of short-term financial behavior (paid credit card in full, spending less or equal to income each month, and not overdrawing checking accounts). The results of the regression, as reported in column 1, indicate individuals who paid their credit card in full tend to be more likely to have better financial knowledge, greater overall financial confidence, and use web and app for work. Individuals who use the web and app for work are 9.1% more likely to pay their credit card in full each month. This could be due to the ease and usage of banking apps for timely payments. Additionally, individuals paying off a credit card balance in full are less likely to be tech-savvy, use mobile for transfers, or use the web or mobile apps for personal use. For the behavior of spending less or equal to income each month, financial confidence and financial knowledge*confidence are positive and significant. Tech-savvy, mobile use in person and for transfer, and web and app for personal use and work, are all significant and negative. This indicates being more tech-savvy and increased use of technology may cause individuals to poorly manage their spending. Technology can make overspending easier by being able to make purchases from a phone. Some apps, such as Amazon, can save your information for very smooth transactions. For the last individual measure of not overdrawing checking accounts, financial knowledge, and overall financial confidence are positive and significant. Tech-savvy, mobile use in person and for transfer, web, and app use for personal and work are all significant and negative. Again, this indicates that those that are more likely to use technology are spending more than they have causing an overdraft in their checking account. This could be related to the impulsive shopping online from a phone or computer.

Financial knowledge positively and significantly explains the overall long-term financial behavior, as indicated in the six different specification/regression results as shown in Table 5. Individuals with good financial knowledge were 8.0% to 10.4% more likely to engage in good or strong long-term financial behavior. Individuals with better than average financial confidence are 15.7% to 17.8% more likely to engage in good long-term financial behavior. The tech-savvy variable positively and significantly explains long-term financial behavior. The same is true for web and app use for personal use and for work. Individuals who use the web or app for personal use and for work were 3.5% and 3%, respectively, more likely to engage in good financial behavior in the long term. These individuals could be using their phones to keep track of their finances and using apps to help save for retirement. They could be using apps to track their long-term investments. In general, technology use and easy adoption could be helpful for efficient planning and managing personal finance.

Table 4 Logistic regression predicting individual measure of short-term financial behavior

Variables	Short-term financial behavior					
	Paid credit full		Spending less/equal to income		Not overdrew checking account	
	(1)	(2)	(3)	(4)	(5)	(6)
Financial knowledge	0.0229**	0.0247***	−0.00506	−0.00533	0.0199***	0.0189***
	(0.00916)	(0.00914)	(0.00695)	(0.00694)	(0.00658)	(0.00655)
Financial confidence	0.199***	0.194***	0.119***	0.122***	0.0620***	0.0673***
	(0.00838)	(0.00838)	(0.00840)	(0.00846)	(0.00746)	(0.00751)
Financial knowledge*Confidence	0.0283**	0.0307**	0.0264**	0.0221*	0.0748***	0.0674***
	(0.0120)	(0.0120)	(0.0116)	(0.0116)	(0.0112)	(0.0112)
Tech-savvy	−0.0283***		−0.0483***		−0.0593***	
	(0.00672)		(0.00576)		(0.00539)	
Mobile use in person		0.00681		−0.0150**		−0.0201***
		(0.00735)		(0.00632)		(0.00588)
Mobile use for transfer		−0.0346***		−0.0312***		−0.0322***
		(0.00725)		(0.00624)		(0.00585)
Web and app for personal use		−0.0401***		−0.0223***		−0.0232***
		(0.00673)		(0.00594)		(0.00559)
Web and app use for work		0.0906***		−0.0202**		−0.0546***
		(0.0103)		(0.00830)		(0.00753)
Pseudo R^2	0.260	0.264	0.098	0.099	0.246	0.250
Observations	19,725	19,725	19,725	19,725	19,725	19,725

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, but not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

Table 5 Logistic regression predicting overall measure of long-term financial behavior

Variables	Long-term financial behavior					
	(1)	(2)	(3)	(4)	(5)	(6)
Financial knowledge	0.104***		0.0922***	0.0799***	0.0803***	0.0797***
	(0.00575)		(0.00559)	(0.00723)	(0.00722)	(0.00722)
Financial confidence		0.178***	0.172***	0.158***	0.158***	0.157***
		(0.00524)	(0.00522)	(0.00724)	(0.00723)	(0.00725)
Financial knowledge*Confidence				0.0298***	0.0309***	0.0332***
				(0.0110)	(0.0110)	(0.0110)
Tech-savvy					0.0258***	
					(0.00608)	
Mobile use in person						−0.000797
						(0.00661)
Mobile use for transfer						0.00147
						(0.00651)
Web and app for personal use						0.0349***
						(0.00611)
Web and app use for work						0.0300***
						(0.00916)
Pseudo R^2	0.321	0.340	0.349	0.349	0.350	0.351
Observations	19,725	19,725	19,725	19,725	19,725	19,725

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

Similar to short-term behaviors, we also use individual measures of long-term financial behaviors, including having an emergency fund, owning a savings account, owning a retirement account, having a non-retirement investment, and having figured out the retirement needs. The results are shown in Table 6 below. The financial knowledge and financial confidence variables are positive and significant for all 10 of the specifications. The marginal effect for the interaction term, financial knowledge*confidence, is positive and significant for the first eight specifications in Table 6. As indicated in columns 9 and 10, the coefficient for the interaction term is negative. However, the net overall impact of financial knowledge and financial confidence on financial behavior is still positive and significant, respectively.[6] Being tech-savvy is also negatively and significantly associated with behaviors of having an emergency fund. This could underscore the idea that being tech-savvy adversely affects the potential saving for a three-month emergency fund. It also confirms that individuals who are using technology more often are more likely to spend rather than save. On the other hand, the more tech-savvy participants have a higher likelihood to have retirement accounts and figure out their retirement needs. This could indicate that individuals could be using technology to establish and monitor their retirement accounts, which helps them to effectively manage their long-term financial needs.

When comparing the regression results of short-term financial behavior (Tables 3 and 4) to long-term financial behavior (Tables 5 and 6), the observed financial knowledge is a relevant variable in explaining financial behavior. We notice that the marginal effects from the long-term regressions are larger than the corresponding marginal effects from the short-term regression. This shows that financial knowledge affects the long-term financial behavior at a much higher rate than short-term financial behavior. On the other hand, the marginal effects of financial confidence appeared to be slightly higher in the short-term models than in the long-term estimation results (Table 3 vs. Table 5). This could be because people receive timely feedback for the short-term financial responsibilities. For example, if people were penalized due to not paying their credit card balance in full, their perception of handling their finances would be more pronounced in short-term rather than long-term financial behavior. As shown in Tables 3 and 5, the tech-savvy variable is negative and significant in the overall short-term financial behavior model, and positive and significant in the overall long-term financial behavior model. This suggests people may use technology recklessly and behave irrationally in terms of managing their short-term finances such as overspending or overriding their credit limit. On the contrary, they may engage in more rational long-term financial behavior that requires long-term planning.

When looking at individual constraints and other socio-economic variables in the regression models for short-term financial behavior, we find that men have better short-term financial behavior against their counterparts, women. On average, White individuals are more likely to have better short-term financial behavior than the reference category, Black. Individuals with a bachelor's or post-graduate degrees are also more likely to engage in better short-term financial behavior compared with high school graduates. Married individuals are less likely to have good short-term financial behavior against unmarried counterparts. This could be due to having a heavier financial burden on a spouse and a family. All income variables are positive and significant with short-term financial behavior (earning annual average income less than 25K is the reference category). The coefficients are highest for those

Table 6 Logistic regression predicting individual measure of long-term financial behavior

Variables	Measures of long-term financial behavior									
	Emergency fund		Saving account		Retirement account		Non retirement investment		Figured retirement	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Financial knowledge	0.0196**	0.0203**	0.0336***	0.0323***	0.0559***	0.0548***	0.0881***	0.0877***	0.124***	0.122***
	(0.00804)	(0.00802)	(0.00676)	(0.00675)	(0.00685)	(0.00685)	(0.00987)	(0.00985)	(0.00968)	(0.00959)
Financial confidence	0.239***	0.235***	0.0860***	0.0876***	0.0509***	0.0517***	0.145***	0.143***	0.0825***	0.0794***
	(0.00748)	(0.00749)	(0.00763)	(0.00762)	(0.00720)	(0.00721)	(0.00949)	(0.00951)	(0.0101)	(0.0101)
Financial knowledge*Confidence	0.0340***	0.0359***	0.0127	0.0134	0.0374***	0.0378***	0.0335***	0.0359***	−0.0990***	−0.0898***
	(0.0114)	(0.0114)	(0.0113)	(0.0112)	(0.0108)	(0.0108)	(0.0125)	(0.0125)	(0.0130)	(0.0129)
Tech-savvy	−0.0240***		0.0326***		0.00269		0.00250		0.137***	
	(0.00638)		(0.00582)		(0.00575)		(0.00686)		(0.00671)	
Mobile use in person		0.00663		−0.0205***		−0.00857		−0.00778		0.0203***
		(0.00698)		(0.00622)		(0.00627)		(0.00751)		(0.00755)
Mobile use for transfer		−0.0483***		0.0393***		0.00432		−0.00747		0.0827***
		(0.00684)		(0.00624)		(0.00620)		(0.00746)		(0.00737)
Web and app for personal use		−0.00908		0.0330***		0.0204***		0.00356		0.102***
		(0.00642)		(0.00583)		(0.00579)		(0.00692)		(0.00689)
Web and app use for work		0.0621***		−0.0156*		−0.00513		0.0676***		0.0640***
		(0.00969)		(0.00846)		(0.00848)		(0.0103)		(0.0103)
Pseudo R^2	0.297	0.300	0.193	0.1961	0.323	0.324	0.226	0.227	0.135	0.144
Observations	19,725	19,725	19,725	19,725	19,725	19,725	19,725	19,725	19,725	19,725

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

Table 7 Logistic regression predicting a measure of overall short-term financial behavior by age group

Variables	Age group			
	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0449*	−0.00711	0.0106	0.0395***
	(0.0264)	(0.0196)	(0.0122)	(0.0151)
Financial confidence	0.180***	0.227***	0.180***	0.199***
	(0.0409)	(0.0284)	(0.0151)	(0.0148)
Financial knowledge*Confidence	0.0179	−0.0230	0.0334	0.00349
	(0.0555)	(0.0335)	(0.0229)	(0.0193)
Tech-savvy	−0.0594**	−0.0345**	−0.0483***	−0.0887***
	(0.0251)	(0.0174)	(0.0104)	(0.0130)
Pseudo R^2	0.176	0.173	0.204	0.257
Observations	1,326	3,112	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

whose income is greater than 100k. Unemployed individuals are less likely to engage in good short-term financial behavior. This intuitively makes sense as those who are unemployed are more likely overdraft their checking account and more likely to overspend. The risk behavior of an individual can also influence their financial behavior. Risky individuals are also less likely to engage in good short-term behavior. This is consistent with previous research by Lyons (2007, 2008) and Robb (2011), which found that risky behavior is associated with poor financial behaviors such as incurring late fees, increases in interest rates, and greater borrowing costs. Both an average and good credit report is positively associated with good short-term behavior. Results are similar when the three individual tech-savvy measures are used as a dependent variable.

For long-term financial behavior, individuals who have a bachelor's degree or a post-graduate degree have better behavior as compared with high school graduates. All income levels are positive and significant with long-term financial behavior against the reference category—earning less than 25K. The coefficients are also highest for those whose income is greater than 100k. Indicating that those individuals who earn more can save better for retirement and long-term financial needs. Unemployed individuals are less likely to have good long-term financial behavior. Risk-taking individuals are more likely to have better long-term financial behavior. This could be due to their risky behavior in earning high returns on long-term investments.[7]

There is extensive literature on the effect of technology across generations. Shobha and Kumar (2020) find, from a sample of India, Gen X is more financially literate, and more likely to engage in long-term financial planning compared with Gen Y. Kumar and Lim (2008) indicate Generation Y and baby boomers substantially vary in the perceived value and loyalty decision on mobile service. Additionally, "Billing services were significantly related to perceived economic and emotional value for both groups" (Kumar & Lim, 2008, p. 577). We examine this relationship in terms of the relevance of technology on different generations' financial behavior. Table 7 reports the marginal effects by age

Table 8 Logistic regression predicting a measure of overall short-term financial behavior by age group

Variables	Age group			
	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0450*	−0.00747	0.0110	0.0413***
	(0.0264)	(0.0196)	(0.0122)	(0.0151)
Financial confidence	0.177***	0.228***	0.183***	0.198***
	(0.0410)	(0.0285)	(0.0152)	(0.0147)
Financial knowledge*Confidence	0.0183	−0.0239	0.0300	0.00126
	(0.0554)	(0.0336)	(0.0230)	(0.0193)
Mobile use in person	0.00394	−0.00263	−0.00698	−0.0177
	(0.0254)	(0.0181)	(0.0111)	(0.0132)
Mobile use for transfer	−0.00239	0.000917	−0.0402***	−0.0666***
	(0.0258)	(0.0186)	(0.0110)	(0.0136)
Web and app for personal use	−0.073***	−0.00931	−0.0228**	−0.0544***
	(0.0249)	(0.0181)	(0.0107)	(0.0110)
Web and app use for work	0.0226	−0.0248	−0.0218	−0.0358
	(0.0279)	(0.0216)	(0.0153)	(0.0247)
Pseudo R^2	0.178	0.172	0.207	0.260
Observations	1,326	3,112	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

group, with overall short-term behavior measure as the dependent variable. The age groups included are iGen/GenZ (18 to 24), millennials/GenY (25 to 34), GenX (35 to 54), and baby boomers (55+).

Overall financial confidence is positive and significant for all age groups. Financial knowledge is significantly and positively related to the short-term financial behavior of Gen Z and baby boomers. Regardless of the age group, overall confidence toward one's finances is more relevant in explaining one's good short-term financial behavior. The tech-savvy variable is still negative and significant irrespective of the age group or generation. That means being tech-savvy has an adverse effect on short-term financial behavior. We notice that the marginal coefficients for the tech-savvy variable for the younger generation or Gen Z and the oldest generation or baby boomers are slightly higher than the other two generation groups, Gen Y and Gen X. This could indicate that those in the youngest generation (Gen Z) and the oldest generation (baby boomers) are not using technology in a way that would benefit their money management in the short-term. Whereas, the millennials and Gen X generation are responsible for their families and they could be relatively sensitive to their spending. Table 8 reports the marginal effects of the individual tech-savvy metric variables, by age group to examine this further.

Mobile use for transfer variables is negative and significant in explaining Gen X, and baby boomers' short-term financial behavior. Those earlier generations who use technology for mobile transfers are 4.0% to 6.7% less likely to engage in good short-term financial behavior. Frequent use of mobile phones for transfers can cause overspending and overdrafts if one is not aware of their current account balance. Web and app for the personal variable are also negatively and significantly related to Gen Z, Gen X, and baby boomers' short-term

Table 9 Logistic regression predicting a measure of overall long-term financial behavior by age group

Variables	Age group			
	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0471	0.0694***	0.0771***	0.0921***
	(0.0295)	(0.0184)	(0.0117)	(0.0103)
Financial confidence	0.145***	0.177***	0.159***	0.145***
	(0.0378)	(0.0241)	(0.0128)	(0.0110)
Financial knowledge*Confidence	0.0476	−0.0463	0.0185	−0.000148
	(0.0487)	(0.0309)	(0.0200)	(0.0154)
Tech-savvy	0.0725***	0.0585***	0.0361***	0.0183
	(0.0249)	(0.0153)	(0.00987)	(0.0113)
Pseudo R^2	0.223	0.302	0.332	0.371
Observations	1,326	3,106	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

financial behavior. These individuals are about 2.3% to 7.3% less likely to engage in good short-term financial behaviors. This web and app use for personal use could be used for shopping which could cause overspending.

Similarly, Table 9 reports long-term financial behavior split up by age group. Similar results show up for overall financial confidence. Financial knowledge is positive and significant for all age groups. As previously stated, one of the main contributions of the paper is to examine the role of technology in financial behaviors. The tech-savvy variable positively and significantly explains the iGen/Gen Z, millennials/Gen Y, and Gen X long-term financial behavior. The tech-savvy variable is insignificant for baby boomers. That could be because baby boomers have more likely settled their retirement or savings account because they are either already retired, or closer to their retirement age. These later generations that are using technology are 3.6% to 7.3% more likely to engage in good long-term financial behaviors, consistent with findings from Shobha and Kumar (2020). This could indicate the effective use of technology for retirement planning and smart savings behavior.

When examining the individual technology variables, in Table 10, we find the variable mobile use for transfers is positively and significantly associated with the financial behavior of iGen/Gen Z and millennials/Gen Y. This indicates that later generations are using mobile phones for transfers more wisely than earlier generations. Later generations are typically more comfortable with technology and are using it in a positive way for their long-term financial behaviors. Web and app for personal use variables are positively and significantly related to the iGen/GenZ, millennials/Gen Y, and Gen X long-term financial behavior. The variable web and app use for work is positively and significantly related to iGen/Gen Z long-term financial behavior. Later generations could be using technology to help with their saving and retirement planning, while earlier generations are more likely to continue to go to a brick-and-mortar location.

Table 10 Logistic regression predicting a measure of overall long-term financial behavior by age group

Variables	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0432	0.0678***	0.0756***	0.0921***
	(0.0293)	(0.0183)	(0.0117)	(0.0103)
Financial confidence	0.136***	0.172***	0.156***	0.145***
	(0.0381)	(0.0242)	(0.0129)	(0.0110)
Financial knowledge*Confidence	0.0569	−0.0420	0.0202	−0.000144
	(0.0488)	(0.0309)	(0.0199)	(0.0154)
Mobile use in person	0.00183	0.000929	−0.00785	0.0187
	(0.0250)	(0.0161)	(0.0105)	(0.0115)
Mobile use for transfer	0.0527**	0.0418**	0.00908	−0.00765
	(0.0262)	(0.0163)	(0.0104)	(0.0117)
Web and app for personal use	0.0502**	0.0603***	0.0574***	0.0134
	(0.0246)	(0.0159)	(0.0101)	(0.00938)
Web and app use for work	0.0604**	0.0165	0.0207	0.0191
	(0.0270)	(0.0193)	(0.0150)	(0.0201)
Pseudo R^2	0.229	0.306	0.335	0.371
Observations	1,326	3,106	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

5. Robustness check

To check the stability and robustness of our results, we made some changes to the definition of our variables of interest and the method of estimation. Regardless of the changes we made for robustness checks, our findings are consistent.

First, we use a tighter definition based on the frequency of use of technology to redefine the aggregate measure of the tech-savvy variable, our main variable of interest, by only including the response "use frequently" to all four questions. Prior logit regression results in Tables 3, 4, 5, and 6 indicate being tech-savvy is negatively and significantly related to good short-term financial behavior, and positively and significantly related to good long-term financial behavior. After redefining the aggregate measure of tech-savvy variable, we then performed the logistic regressions for short-term and long-term financial behavior by age group. For short-term financial behavior, the tech-savvy variable is still negative and significant across the majority of the age groups (see Appendix Table T1). This confirms that the more frequent use of technology could have an adverse impact on personal finance management. When breaking down the redefined tech-savvy variable, we find that the main driver of the negatively significant effect on short-term behavior is mobile use for transfers (see Appendix Table T2), which indicates individuals using technology frequently tend to over-transfer or overspend and hurt their short-term financial status. Similarly, looking at the regression of long-term financial behavior by age group as indicated in Appendix Table T3, the relationship between being tech-savvy and long-term financial behavior is still positive and significant, except for the Gen Z group. Table T4 in the appendix shows, among the individual measures of being tech-savvy, the Web and App for Personal Use variable is the main driver for the positive and significant effect, which demonstrates that the more frequent

use of web and app among Gen Y, Gen X, and baby boomers tends to be more likely, compared with Gen Z, planning for their retirement and non-retirement investments.

As an additional robustness check, we adopt a stricter definition of the variable tech-savvy as individuals who affirmed at least three out of four questions on using technology in personal finance matters. As indicated in Appendix Table T5, the marginal effect of being tech-savvy on overall short-term financial behavior is consistently negative and significant. When using individual measures of short-term financial behavior, the marginal effect of the redefined variable tech-savvy remains dominantly negative and significant on the short-term financial behavior of spending less or equal to income and not overdrawing the account, except for the behavior of paying credit in full. By the same token, as indicated in Appendix Table T6, the results of the logit regression on the overall long-term financial behavior demonstrate the marginal effect of the more strictly defined variable tech-savvy remains positive and significant on the long-term financial behavior. Additionally, the positive marginal effect of tech-savvy stays positive across each individual measure of long-term financial behavior.

To ensure tech-savvy variable affects financial behavior regardless of how the variable is defined, ordinary linear regression is reconsidered. Tech-savvy variable is defined as a continuous variable, (ranging from 0 to 4, with 0 being not tech-savvy at all, and 4 being the most tech-savvy), instead of a binary variable. For interpretation purposes, the value of tech-savvy is standardized in the regression. As indicated in Appendix Table T7, the regression results demonstrate a consistent finding: the variable tech-savvy is negatively and significantly related to short-term financial behavior across the regressions of using overall or individual measures, echoing previous results. The results in Appendix Table T8 show tech-savvy is positively and significantly related to positive long-term financial behavior across the overall and individual measures, except for having an emergency fund.

To further investigate the tangible impact of tech-savvy on individuals engaging in different levels of good short-term financial behavior, we adopt an ordered logit model. As indicated in Appendix Table T9 in the appendix, consistent with the earlier results, the net marginal effects show that, on average, the most tech-savvy individuals are 4.8% (0.0198–0.0681) more likely, than non-tech–savvy individuals, to engage in adverse short-term financial behavior. Similarly, on average, the most tech-savvy individuals are 1.1% (−0.0302 + 0.0196) more likely to engage in good long-term financial behavior.

Second, we redefined the dependent variables—both short-term and long-term behavior as an additional robustness check. While we adopt a loosened criterion to examine individuals with at least two out of three positive short-term financial behaviors, the variable tech-savvy is negatively and significantly associated with short-term financial behavior (results available upon request), which is consistent with our previous findings. Additionally, the negative impact of being tech-savvy seems to be smaller (−0.045 vs. −0.064) when individuals engage in fewer good short-term financial behaviors. Similarly, the binary variable of long-term financial behavior is redefined as individuals with at least four out of five good long-term financial behaviors, compared with the previous definition of at least three good long-term financial behaviors. Again, the logit regression of redefined long-term financial behavior indicates the variable tech-savvy shows a positive and significant impact on the long-term financial behavior (0.0151 vs. 0.0258), which is consistent with previous findings.

Third, we address the concern of the potential endogeneity of financial literacy as a control variable in financial behavior regression (Lusardi & Mitchell, 2014; Van Rooij et al., 2009): financial knowledge may predict financial behavior, and financial behavior may also predict financial literacy or knowledge. Given the limitation of the NFCS dataset, it is difficult to do two-stage regressions with the instruments as in the previous literature (Lusardi & Mitchell, 2014). However, as Wagner and Walstad (2019), we estimated both the short-term and long-term financial behavior models with and without financial education variables. The marginal effects of our main variable of interest—tech-savvy—do not change both statistically and economically. As shown in Appendix Table T10, the marginal effect of being tech-savvy on the overall short-term financial behavior is consistently negative and significant before and after controlling for financial education and/or financial confidence variables. Similarly, a consistently positive and significant marginal effect of being tech-savvy is found on the overall long-term financial behavior before and after controlling for financial education and/or financial confidence variables.

Finally, we restrict the sample when regressing short-term financial behavior into two groups, those with high/strong and low/weak long-term financial behavior. The same is done for long-term financial behavior restricted into high and low short-term financial behavior. Results are consistent in the restricted regressions. Tech-savvy is negatively and significantly associated with short-term financial behavior, while it is positively and significantly associated with long-term financial behavior. We also performed an ordered logit to examine the marginal effects which represent the net effects of the lowest and highest financial behavior categories. This again confirms our previous results with the net marginal effect for tech-savvy being -0.092 short-term financial behavior for the sample restricted to high long-term financial behavior and -0.005 for the sample restricted to low long-term financial behavior. When regressing long-term financial behavior, the net marginal effects of the variable tech-savvy are 0.032 and 0.0151 for the restricted samples on high short-term financial behavior and low short-term financial behavior, respectively (see Appendix Table T11).

6. Conclusion and future discussion

The study examined how being tech-savvy affects personal short-term and long-term financial capability. The tech-savvy variable was consistently negative and significant in the short-term model. However, the tech-savvy variable was positive and significant in the long-term model. This result could indicate that technology allows more risk-tolerant individuals to behave imprudently in the short-term, making it easy for individuals to overspend. However, over the long-term, individuals may engage in more rational long-term financial behavior using technology.

This paper also examined how financial capability and technology savviness can vary across generations. We found being equipped with good financial knowledge favors Gen Z and baby boomers to engage in positive short-term financial behavior and being financially confident is positively associated with good short-term financial behavior across all generations. Our variable tech-savvy was found negative and significant across all generations for

short-term financial behavior. This could indicate that those in the youngest generations and oldest generations are not using technology in a way that would benefit their money management in the short-term. Tech-savvy individuals in Gen Z, millennials, and Gen X are more likely to engage in good long-term financial behavior.

Finally, this paper supports similar research on financial capability with updated national data. Our findings echo the prior research that people with better than average actual financial knowledge or financial confidence tend to be more likely to engage in good short-term and long-term financial behavior.

One of the limitations noted is related to using self-reported survey data to measure tech-savvy and financial behaviors. It is difficult to confirm whether people behave in a certain way as they respond to financial behavior-related questions. The variable tech-savvy is constructed based on the general response to whether the respondents use their mobile or web app to purchase things or transfer money. It would have been more relevant if the survey asked if the respondents used their mobile phone or an app to manage their finances. Plus, the NFCS data are not rich enough to specify the sources of the financial background of the respondents. In future research, we hope to collect data and focus on a college student population. Looking into different demographics such as first-generation college students, commuters, and students who are working part-time, or full-time jobs will provide policy implications on personal financial management among young generations.

Notes

[1] Among the survey participants who used BNPL, 29% indicated they would have spent less, or not spent at all without the financing option (McKinsey Digital Payments Consumer Survey, 2021).

[2] Objective financial knowledge questions assess true skills and knowledge pertaining to personal financial decisions while subjective financial knowledge questions evaluate self-perception on dealing with personal financial matters.

[3] The conventional age cut off in defining generation is slightly different in our sample. Pew Research Center defines generation as follows: Gen Z (born after 1996), Gen Y (born 1981–1996), Gen X (1965–1980), and baby boomers (1946–1964).

[4] The responses to each of the six questions were re-coded, as a dummy variable, "1" for a correct response and "0" otherwise. The overall score was computed by adding the binary numbers attached to the six questions that ranged 0 to 6, 0 being none of the six questions were answered correctly and 6 being all were responded correctly. The binary variable of financial knowledge, then, was created by assigning "1" if the overall score is above the average score, 2.11, and "0" if not.

[5] On average, respondents rated their current financial condition as 5.72 (scaled from 1, not at all satisfied, to 10, extremely satisfied), overall financial knowledge as 5.13 (scaled from 1, very low, to 7, very high), and day-to-day financial matters as 5.76 (scaled 1, strongly disagree to 10, strongly agree). Then, a binary variable as a measure of composite financial confidence was created by adding all the binary responses to the

three questions and coded as "1" if the overall score is higher than the average score, and "0" if not (see Table 3 for the detail statistics).

[6] (9) Financial knowledge = 0.124–0.099*0.51726 = 0.072; Financial Confidence = 0.0825–0.099*0.5109 = 0.0319

(10) Financial knowledge = 0.122–0.0898*0.51726 = 0.076; Financial Confidence = 0.0794–0.0898*0.5109 = 0.034

[7] The detailed estimation results for these demographic and socio-economic variables will be available upon request.

Appendix

Table A1 Logistic regression predicting a measure of overall short-term financial behavior by age group

Variables	Age group			
	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0422	−0.00818	0.0112	0.0377**
	(0.0264)	(0.0196)	(0.0122)	(0.0151)
Financial confidence	0.183***	0.225***	0.178***	0.198***
	(0.0411)	(0.0284)	(0.0151)	(0.0148)
Financial knowledge*Confidence	0.0221	−0.0224	0.0343	0.00596
	(0.0556)	(0.0336)	(0.0230)	(0.0193)
Tech-savvy	−0.0463*	−0.0193	−0.0210*	−0.0730***
	(0.0242)	(0.0169)	(0.0116)	(0.0154)
Pseudo R^2	0.174	0.268	0.202	0.255
Observations	1,326	3,112	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

Table A2 Logistic regression predicting a measure of overall short-term financial behavior by age group

Variables	iGen/GenZ	Millennials/GenY	GenX	Baby boomers
Financial knowledge	0.0416	−0.00805	0.0113	0.0381**
	(0.0265)	(0.0196)	(0.0122)	(0.0151)
Financial confidence	0.174***	0.231***	0.182***	0.198***
	(0.0413)	(0.0286)	(0.0152)	(0.0148)
Financial knowledge*Confidence	0.0219	−0.0267	0.0298	0.00513
	(0.0555)	(0.0337)	(0.0230)	(0.0193)
Mobile use in person	0.0668*	−0.000904	0.00223	−0.0136
	(0.0354)	(0.0233)	(0.0163)	(0.0245)
Mobile use for transfer	−0.0600**	−0.0285	−0.0323*	−0.104***
	(0.0297)	(0.0221)	(0.0183)	(0.0325)
Web and app for personal use	−0.0440	−0.0102	−0.0244	−0.0440**
	(0.0326)	(0.0218)	(0.0164)	(0.0220)
Web and app use for work	0.0463	−0.0364	−0.0336	−0.100**
	(0.0436)	(0.0289)	(0.0254)	(0.0510)
Pseudo R^2	0.177	0.318	0.203	0.255
Observations	1,326	3,112	6,849	8,438

Note. The marginal coefficients of other control variables (gender, education level, employment status, marital status, income, race, risk level measures, and credit score) are included in the regression, not reported here.

Standard errors in parentheses: ***$p < .01$, **$p < .05$, *$p < .1$.

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