Consumer Margin Use: Understanding the Role of Peer Influence, Investment Literacy, and Age

Kaplan Sanders[1] and Olamide Olajide[2]

Abstract

Very little has been observed regarding household decisions around margin use. Using the 2021 wave of the National Financial Capability Study (NFCS), this study investigates margin use from a consumer's perspective. Using probit analysis and observing correlations, relationships between peer influence, investment literacy, age, and margin use are explored. Results indicate a positive peer influence on the decision to buy on margin. Also, younger individuals and individuals with higher degrees of investment literacy have a higher probability of buying on margin. These findings have implications for policymakers as well as those who provide financial advice.

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Introduction

As of May 2024, debit balances in customers' margin accounts for financial securities exceeded $809 million dollars (FINRA, 2024). These debit balances represent an opportunity, at a cost, to increase buying power in an effort to improve portfolio returns. Buying on margin allows investors to borrow funds from a broker to increase their purchasing power and opens up a wider range of investment strategies. When investors make the decision to buy on margin, they use their portfolios as collateral, bringing the potential for greater investment volatility, margin calls, and even a possible forced liquidation of the investor's position. Therefore, an investor deciding to borrow on margin must not only consider the terms of the loan, but also the stability of the portfolio, market prospects, and accessibility to other funds in the event of an economic downturn.

The decision to buy on margin is similar to other consumer decisions. Juster and Shay (1964) reveal why individuals might make purchases on margin when they compare individual and corporate investments in debt. Much like a corporation that weighs alternatives when considering taking on a loan to improve profits, an individual will borrow on margin only when they perceive that the financial and psychological benefits outweigh the financial and psychological costs associated with the debt. In this context, if an individual expects a net increase in utility, considering all costs, they are likely to choose to buy on margin.

The majority of the literature on margin has not focused on individual investors but has instead concentrated on the effects that margin requirements and margin purchases have on the market. For example, as margin requirements decrease, the amount of margin available to investors increases, resulting in higher price

[1] Corresponding author (kaplan.sanders@utahtech.edu). Utah Tech University, St. George, Utah, USA.
[2] Texas Tech University, Lubbock, Texas, USA.

volatility and trading volume (Zhang & Li, 2013). Similar results are found in Japanese stock markets (Hardouvelis & Peristiani, 1992). In addition, buying on margin may lead to speculative stock bubbles when the market prohibits short selling (Ackert et al., 2006). Observing individual investment behavior using simulated data, Ayres and Nalebuff (2010) argue that younger investors who face liquidity constraints may only be able to have a diversified portfolio of stocks by borrowing on margin.

An investor's decision to purchase securities on margin may be based on their own human capital or by relying on the decisions and behavior of other investors. The use of an investor's own human capital to make margin purchases can be assessed by measuring their investment knowledge. As an alternative, investors could choose to rely on the actions of other investors (like their peers or other individuals in their social network), especially when faced with uncertain situations (Keynes, 1937), because they believe that these peer investors must be right (Xu, 2023).

This study seeks to build on existing literature by observing margin use from a household perspective. The 2021 wave of the National Financial Capability Study (NFCS) State-by-State and Investor Surveys permit a deeper view of margin behavior. This study performs a cross-sectional analysis of investors who make purchases on margin. Specifically, this study examines the relation of peer or social influence (and possible herding behavior) to the decision to purchase securities on margin while also exploring how age and investment literacy are related.

Findings from this study would be beneficial to individual or household investors and financial professionals working with clients. For individual and household investors, this study creates and enhances awareness of an inherent peer bias driving investment decisions. This awareness could possibly lead to better investment outcomes and holistic financial health, especially where peer influence is incongruent with an individual's risk tolerance and investment goals. Financial professionals can identify inherent peer biases with their clients, address these biases, and offer financial advice and education tailored to their clients, given these biases.

Conceptual Framework

Buying on margin involves the purchase of assets using one's portfolio as collateral. Therefore, while the decision to buy on margin is primarily viewed as an investment decision, it includes a debt decision as well. The following review will focus on peer influence, financial literacy, and age from both an investment and a debt perspective. While previous studies have focused primarily on financial literacy, this study will focus on investment literacy as a domain-specific form of financial literacy.

Buying on Margin as an Investment Decision

For many, peer and social influence play a major role in their investment decisions from financial market participation to investment selection and allocation. Several studies indicate the peer effect on financial market participation. One such study is that of Nguyen and Nguyen (2020) which examined how the interaction of financial literacy and peer effect indicators influence participation in financial markets. The study found peer effect and perceived financial literacy to significantly influence the respondents' participation in financial markets (similar results focusing on stock market participation were found by Hong et al., 2004). The peer effect or social influence observed might be explained indirectly through risk tolerance (Mylondis & Oikonomou, 2021). This influence of risk tolerance on the relationship between peer influence and financial market participation is supported by the findings of Frydman (2015) which showed a positive relationship between peer influence and risky asset allocations.

Focusing on workforce peer effects, Gerrans et al. (2018) explored the role of workforce peer influence on investment strategies. Gerrans et al. (2018) showed that workforce peers positively influence a change in investment strategies, particularly for peers of the same gender. Furthermore, Heimer (2016) discovered a link between peer influence and the disposition effect. The disposition effect explains the tendency to hold on to losing assets for too long and sell winning assets quickly. Based on the premise of

a positive association between peer influence and increased trading, Heimer (2016) investigated the relationship between these two phenomena. The study found a positive association between peer influence and disposition effect.

With the growth of social media, peer and social influence is even more evident in consumer behavior and decision making today. Social media creates an avenue for individuals across all age groups to engage in learning, collaboration, and the exchange of ideas. They are able to do this on a wide variety of subject areas including financial topics like investing and managing debt which in turn shapes financial decision making (Cao et al., 2020). These social media platforms offer information from various sources ranging from peers to financial experts and financial influencers (Place, 2022). Also, because social media allows its users to publicize their achievements and lifestyles, it magnifies the impact of peer and social influence by creating a perception of reality that individuals may feel pressured to follow (De Veirman et al., 2017). On the one hand, the use of social media has been associated with positive financial outcomes and better financial decision-making (Cao et al., 2020). However, it could raise concerns about the validity and efficacy of such information, as well as the possibility of widespread misinformation (Corbin, 2023; Place, 2022).

Financial literacy has been linked to household investment decisions (Lusardi and Mitchel, 2014). For example, financially literate individuals invest more in stocks than less financially literate individuals (Van Rooij et al., 2011). Additionally, higher degrees of financial literacy provide opportunities that would have otherwise been unavailable (Huston, 2010). Furthermore, individuals whose subjective financial literacy is greater than their objective financial literacy invest more in risky assets like stocks (Verma, 2017).

Another factor that influences investment decisions is age. Charles et al. (2013) investigated whether age affected investment decisions and the behavior of investors. The study found that age is related to investment behavior and found that compared to older investors, younger investors invest more in the equity market and were more likely to buy on margin. Similarly, while examining the investment decisions of older investors, Korniotis and Kumar (2011) found that older investors' portfolios reflected greater investment knowledge as they diversified more, held less risky portfolios, traded less frequently, and were less susceptible to disposition effects. However, these older investors were found to have worse investment skills due to cognitive decline. This lower investment skill was observed based on the older investors' lower return and portfolio performance on a risk-adjusted basis. Shivapour et al. (2012) investigated the investment motivations among older and younger investors and opined that older investors were more worried about monetary loss, while younger investors were more motivated by financial gains.

Given the review of the literature, the influence of peers and social networks in financial decision-making, including investment decisions, is significant. However, problems might arise when these investors follow the advice of their peers blindly without critically considering the impact of such decisions on their personal finances, either because of a lack of knowledge or an inability to apply such knowledge. This behavior of blindly following peers is known as herding. Khalid (2020) examined the mediating role of financial self-efficacy in explaining the relationship between herding and investment behavior and indicated that financial self-efficacy mediated a negative association between herding and investment behavior.

Buying on Margin as a Debt Decision

Peer and social influence are also related to choices around debt. Research using the financial socialization framework has shown that family, peers, schools, and mass media are important socialization agents that influence how individuals acquire and shape financial knowledge and their attitudes toward their personal finances, including debt (Gutter et al., 2010; LeBaron-Black, et al., 2023; Supinah et al., 2016). Throughout an individual’s lifecycle, the influence of these socialization agents might change. For instance, Churchill and Moschis (1979) showed that as adolescents become young adults, communication about consumption with

peers increases, while communication with parents regarding consumption declines, indicating peer influence on financial knowledge, attitudes, and behaviors (including debt decisions) supersedes parental influence (Bakir et al., 2006).

Turning to the relationship between peer and social influence on debt behavior, the literature is mixed. For example, Georgarakos et al., (2014) investigated the effect of social influence on the likelihood of holding and taking on various forms of debt, and the size of the loans, based on the perceived income of their peers. The study revealed that individuals who perceived their income to be less than their peers were more likely to borrow both secured and unsecured loans and were more likely to have sizeable loans. Similar results were found by Berlemann and Salland (2016), who also showed that these individuals were susceptible to peer effects and made more use of overdrafts. Focusing on repayment behavior, Breza (2010) examined the influence of peer repayment on the repayment decision of individuals and found that borrowers were more likely to repay their loans if their peers moved from being in default to making full repayment. However, Jamilakhon et al. (2020), while exploring the association between financial education, debt attitude, peer influence, and power prestige, discovered no significant influence of peers on debt behavior. Similar results were found by Dusia et al. (2023).

Age and financial literacy have also been found to be associated with debt decisions. For instance, those with lower levels of financial literacy have been found to make costly debt decisions more frequently (Chatterjee, 2013) and carry higher debt balances (Brown & Graf, 2013; Gathergood & Disney, 2011; Lusardi & Tufano, 2015). Concerning age, Del Rio and Young (2006), while focusing on unsecured debt, discovered that younger individuals aged 20 to 30 years old were the most likely to hold unsecured debt. Similar results were found by Eberhardt et al. (2018). Interestingly, Agarwal (2007) found that age had a "U-shape" with the cost of borrowing when analyzing how age influences different debt decisions like auto loans, home equity loans, home equity lines of credit, credit cards, and mortgages. This means that middle-aged adults borrowed at lower costs (fees and interest rates) than younger and older adults.

Herding

Herding theory as explained by Keynes (1937) forms the theoretical basis for this study. Herding, an integral part of behavioral finance, is a phenomenon that explains the tendency of individuals or investors to make decisions based on the actions of others. (Keynes, 1937). According to Keynes (1937), these individuals or investors mimic the actions and behaviors of others when faced with volatile and uncertain situations, because they believe that these other investors know better. Pompian (2012) explains that herding behavior could be caused by regret aversion. According to Pompian (2012), regret aversion is the tendency of investors to make decisions for fear of making a mistake or fear of missing out on a great deal or investment. Therefore, they follow the crowd and actions of other investors to limit the likelihood of future regret, believing that the majority must be right (Xu, 2023).

Trust heuristic could be another source of herding (Trehan & Sinha, 2019). When making investment decisions, people tend to rely on the advice and actions of influential figures, family, their social or religious groups, and their peers. As a result of this reliance, the uncertainty they feel about the situation or decision is reduced and decision making is faster. However, problems arise when these decisions made out of herding are suboptimal for these investors, considering their risk portfolio and other circumstances unique to them.

Buying on margin is a unique position as it involves the purchase of securities by borrowing from brokerage firms, with the hope of making a profit when the returns from the investment exceed the borrowing costs. Because of the investment and debt position that buying on margin is, while it has the potential to increase returns, it brings significant risks. Therefore, it is important that the investors are fully aware of the risks involved. When individuals herd, the uncertainty investors feel about their investing decision or position is reduced, even though the inherent risk of the position is not reduced (Xu, 2023). So, investors who invest because their

peers are investing (i.e. investors susceptible to herding) are more likely to buy on margin, especially if their peers are holding that position, because it gives them a false sense of certainty about buying on margin even though buying on margin increases the potential volatility of their position.

Younger individuals may be more likely to make purchases on margin. As previously discussed, buying on margin is very risky; therefore, individuals with higher risk tolerance are more likely to engage in margin purchases. Based on the life-cycle hypothesis, age is negatively associated with risk tolerance, as younger individuals tend to have higher risk tolerance because of their extended time horizon. Having more time to experience investment volatility allows them to recover from possible losses from riskier investment choices (Mylondis & Oikonomou, 2021; Yao et al., 2011). Also, compared to older individuals, younger individuals are more susceptible to peer and social influence (Carolan, 2018; Khan et al., 2016) and peer influence is positively associated with risk tolerance (Frydman, 2015; Gardner & Steinberg, 2005). Therefore, it is expected that younger investors will be more likely to buy on margin.

Given the herding theory and the review of previous literature that has shown the impact of peer influence, investment literacy, and age on decision making, this study hypothesizes the following:

H_1: Investors susceptible to the herding effect (i.e., those who invest because their peers are also investing) are more likely to buy on margin.

H_2: Investment literacy significantly influences margin purchase decisions.

H_3: Age negatively relates to margin purchase.

Methodology

Data/Sample

This study uses combined data from the 2021 wave of the National Financial Capability Study (NFCS) State-by-State and Investor Surveys. The Investor Survey is a follow-up survey from the more broad-based NFCS State-by-State Survey and was conducted to take a deeper look at factors associated with investor decisions. Both surveys have been commissioned by the FINRA Investor Education Foundation and were conducted by Applied Research and Consulting LLC (ARC). The Investor Survey was completed by 2,824 individuals who hold investments outside of retirement accounts. Responses from both surveys were combined to allow for a more robust set of variables in the model. Survey weights, which are provided based on data from the American Community Survey, are used to make the sample representative of the United States population. Responses such as "Don't know" and "Prefer not to say" are omitted from the sample in most instances.

Variables

The dependent variable was measured based on responses to the following questions: (a) "Do any of your investment accounts allow you to make purchases on margin?" and (b) "Have you made any securities purchases on margin?" Responses were organized into two outcomes. Where respondents stated that they do not have or do not know if they have investment accounts that allow margin purchases (n = 1,736), or that they did not make or do not know if they made purchases on margin (n = 408), responses were coded as "No, I have not made any securities purchases on margin." Respondents who affirmed that they had made purchases on margin were coded as "Yes, I have made securities purchases on margin" (n = 192).

The key explanatory variable in this study is the influence of peers on investment behavior. Respondents ranked how well the following statement describes why they invest on a scale of 1 ("Does not describe at all") to 3 ("Describes very well"): "My peers are doing it/social activity/connecting with others." Peer influence enters the model as a series of dummy variables with 1 as the reference category.

Financial literacy pertaining to investment-specific knowledge (hereafter, investment literacy score) is measured by adding correct responses to 11 items (see Appendix for complete language). These items cover topics such as attributes of stock/bond ownership, the risk/return relationship, active/passive

management, margin, short selling, and options. Financial literacy is included in the model as a continuous variable.

For the variable on expected relative portfolio performance, respondents are asked the following question: "Over the next 12 months, how well do you expect your portfolio of investments to perform?" Responses range from 1 ("Worse than the market as a whole") to 3 ("Better than the market as a whole"). Expected relative portfolio performance enters the model as a series of dummy variables with 1 as the reference category.

To represent the nature of margin being at least partially a debt decision, and to explore how an individual's perception of their debt might influence ongoing debt decisions, over-indebtedness is included in the model for margin use. Responses to the statement "I have too much debt right now" range from 1 ("Strongly disagree") to 7 ("Strongly agree") with 1 as the reference category.

Other explanatory variables include willingness to take risks (on a scale of 1 to 5 with 5/5 being "Very willing" and 1/5 as the reference category) and non-retirement account value (including 10 categories ranging from "Less than $2,000" to "$1,000,000 or more" with "Less than $2,000" as the reference category). Gender, age, race/ethnicity, and marital status are also included in the model. Gender is stated as a dichotomous variable with Male as the reference category. Age enters the model as a continuous variable ranging from 18 to 92. Race/ethnicity is reported as "White Non-Hispanic," "Black non-Hispanic," "Hispanic (alone or in combination)," "Asian/Pacific Islander non-Hispanic," and "Other non-Hispanic (American Indian, Other, 2+ ethnicities)" and "White Non-Hispanic" is the reference category. Finally, marital status is organized into the following four categories: "Single," "Married," "Divorced/Separated," and "Widowed" with "Single" being the reference category.

Data Analysis

This paper estimates the following probit model:

$$Yi^* = \beta 0 + \beta\, Xi + \varepsilon \quad (1)$$

$$Yi = 1 \text{ if } Yi^* > 0 \text{ (buy on margin)} \quad (2)$$

$$Yi = 0 \text{ if } Yi^* \leq \text{(no buy on margin)} \quad (3)$$

where Y_i^* is a latent measure of the decision of an individual i to make purchases on margin. Y_i is the observed dependent variable (the decision to make purchases on margin) of an individual i. β_0 is the intercept, while β is a vector of coefficients showing the association of the independent variables with the latent variable. X_i is a matrix that consists of predictor variables, including peer influence, investment literacy score, expected relative portfolio performance, having too much debt, willingness to take risk, value of non-retirement accounts, gender, age, race, and marital status. ε is the error term, which is assumed to follow a normal distribution.

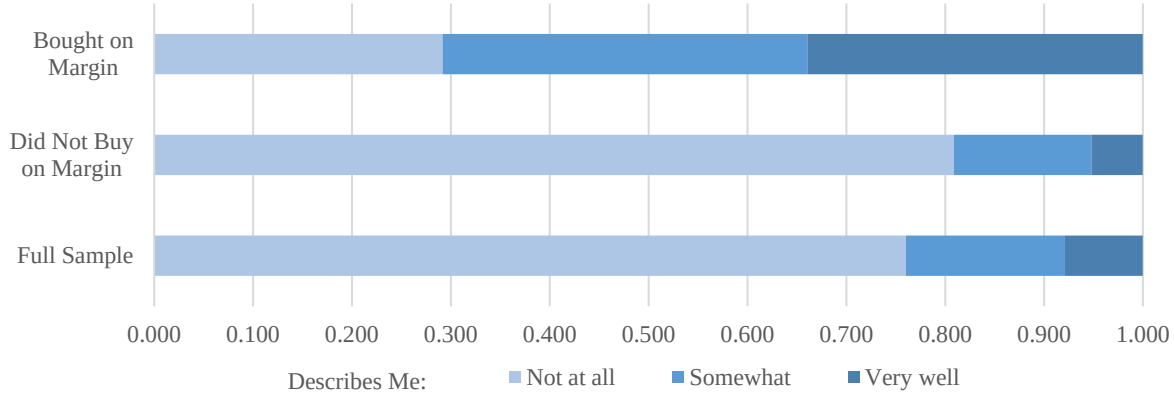
Table 1. Descriptive Statistics		**Buy on Margin?**	
	Overall Sample	**Yes**	**No**
	Mean / (Std. Err.)	*Mean / (Std. Err.)*	*Mean / (Std. Err.)*
Buy on Margin			
Yes	0.094		
	(0.008)		
No	0.906		
	(0.008)		
Why Invest: Peer Influence			
Not at all	0.760	0.292	0.809
	(0.011)	(0.040)	(0.010)
Somewhat	0.161	0.369	0.139
	(0.009)	(0.043)	(0.009)
Very well	0.079	0.339	0.052
	(0.007)	(0.039)	(0.006)
Investment Literacy Score	5.386	4.992	5.375
	(0.059)	(0.233)	(0.065)
Expected Relative Portfolio Return			
Worse than market	0.045	0.044	0.045
	(0.005)	(0.015)	(0.005)
Same as market	0.672	0.426	0.698
	(0.012)	(0.044)	(0.012)
Better than market	0.282	0.530	0.257
	(0.011)	(0.044)	(0.011)
I have too much debt right now			
1 (Strongly disagree)	0.562	0.312	0.588
	(0.012)	(0.039)	(0.013)
2	0.109	0.088	0.111
	(0.008)	(0.031)	(0.008)
3	0.065	0.072	0.064
	(0.006)	(0.023)	(0.007)
4	0.093	0.125	0.090
	(0.008)	(0.033)	(0.008)
5	0.068	0.057	0.069
	(0.006)	(0.018)	(0.007)
6	0.029	0.074	0.024
	(0.004)	(0.023)	(0.004)
7 (Strongly agree)	0.074	0.273	0.054
	(0.006)	(0.037)	(0.006)
Willingness to take risk			
1 (Not at all willing)	0.070	0.008	0.076
	(0.007)	(0.008)	(0.007)
2	0.156	0.013	0.171
	(0.009)	(0.009)	(0.010)
3	0.277	0.135	0.291
	(0.011)	(0.033)	(0.011)
4	0.362	0.376	0.361
	(0.012)	(0.042)	(0.012)
5 (Very willing)	0.135	0.468	0.101
	(0.008)	(0.043)	(0.008)

Non-retirement account value			
< $2,000	0.065	0.014	0.070
	(0.007)	(0.011)	(0.007)
$2,000-$5,000	0.052	0.045	0.053
	(0.006)	(0.021)	(0.006)
$5,000-$10,000	0.047	0.089	0.042
	(0.006)	(0.033)	(0.005)
$10,000-$25,000	0.069	0.053	0.070
	(0.006)	(0.018)	(0.007)
$25,000-50,000	0.072	0.062	0.074
	(0.006)	(0.018)	(0.007)
$50,000-$100,000	0.132	0.215	0.124
	(0.008)	(0.033)	(0.008)
$100,000-$250,000	0.180	0.197	0.179
	(0.009)	(0.035)	(0.010)
$250,000-$500,000	0.151	0.115	0.154
	(0.009)	(0.025)	(0.009)
$500,000-$1,000,000	0.113	0.114	0.113
	(0.007)	(0.028)	(0.008)
$1,000,000	0.119	0.096	0.121
	(0.008)	(0.025)	(0.008)
Gender			
Male	0.637	0.750	0.626
	(0.012)	(0.038)	(0.012)
Female	0.363	0.250	0.374
	(0.012)	(0.038)	(0.012)
Age	56.907	43.084	58.340
	(0.406)	(1.255)	(0.408)
Race/Ethnicity			
White non-Hispanic	0.724	0.615	0.735
	(0.012)	(0.046)	(0.013)
Black non-Hispanic	0.058	0.095	0.054
	(0.006)	(0.023)	(0.006)
Hispanic (alone or in combination)	0.106	0.177	0.098
	(0.010)	(0.044)	(0.010)
Asian/Pacific Islander non-Hispanic	0.093	0.100	0.092
	(0.008)	(0.030)	(0.008)
Other non-Hispanic	0.020	0.013	0.021
	(0.003)	(0.008)	(0.003)
Marital status			
Single	0.195	0.246	0.189
	(0.010)	(0.039)	(0.010)
Married	0.661	0.708	0.657
	(0.012)	(0.040)	(0.012)
Divorced/Separated	0.096	0.044	0.101
	(0.007)	(0.015)	(0.008)
Widowed	0.048	0.002	0.053
	(0.005)	(0.002)	(0.006)
N	2,336	192	2,144

Note: Data from the 2021 NFCS Investor and State-by-State Surveys.

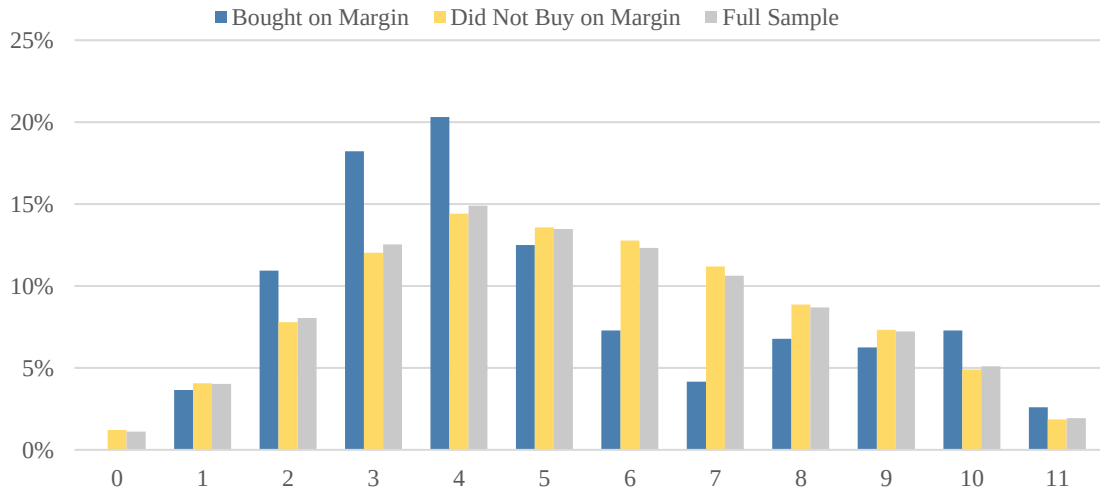
Large differences can be seen between those who do and those who do not buy on margin. For example, fewer than 30% of those who have made purchases on margin report that peer influences do "Not at all" describe why they invest compared to over 80% of those who have not made purchases on margin. Conversely, over a third (33.9%) of respondents who have made margin purchases report that peer influences describe why they invest "Very well," compared to about 5% of those who do not make purchases on margin (see Figure 1).

Figure 1. Investment Motivation: My Peers are Doing it/Social Activity/Connecting with Others



Those who make margin purchases appear to have a lower average investment literacy score (5.196/11) than those who do not make margin purchases (5.406/11). The distribution of scores can be seen in Figure 2, showing the same trend of lower investment literacy scores among margin purchasers, but also showing that higher scores (10/11 and 11/11) were slightly more common among those who made purchases on margin than those who did not. A much larger percentage of respondents who have made purchases on margin (53.0%) expect their portfolios to outperform the market relative to those who have not made purchases on margin (25.7%). Finally, those who buy on margin appear to report having too much debt more commonly than those who do not.

Figure 2. Comparison of Investment Literacy Score Among Those Who Did and Did Not Buy on Margin



The relationships between age and peer influence and age and buying on margin are found in Figures 3 and 4, respectively. Both demonstrate similar downward trends, with responses being more disparate from age to age among younger participants and more concentrated among those who are older (finally closing in on 0% or "Not at all" by just over the age of 80)

Figure 3. Investing Due to Peer Influence by Age

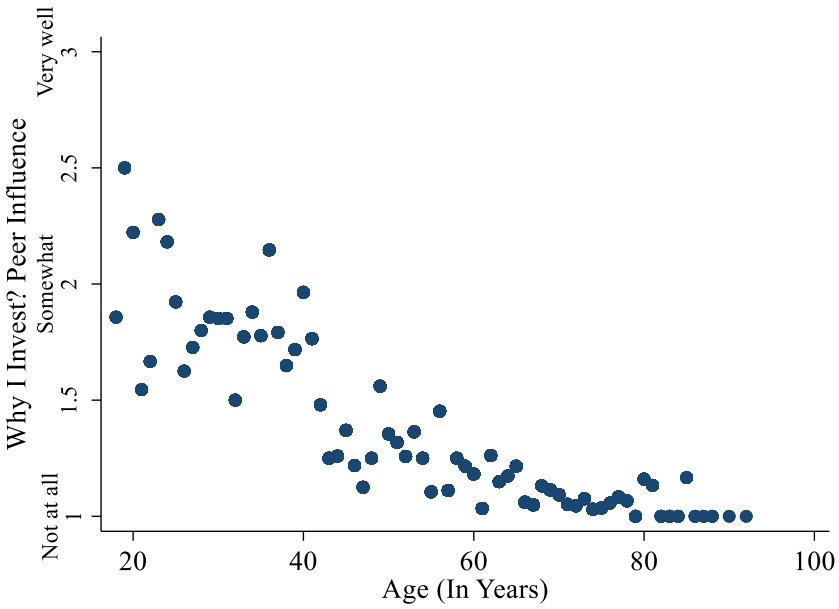
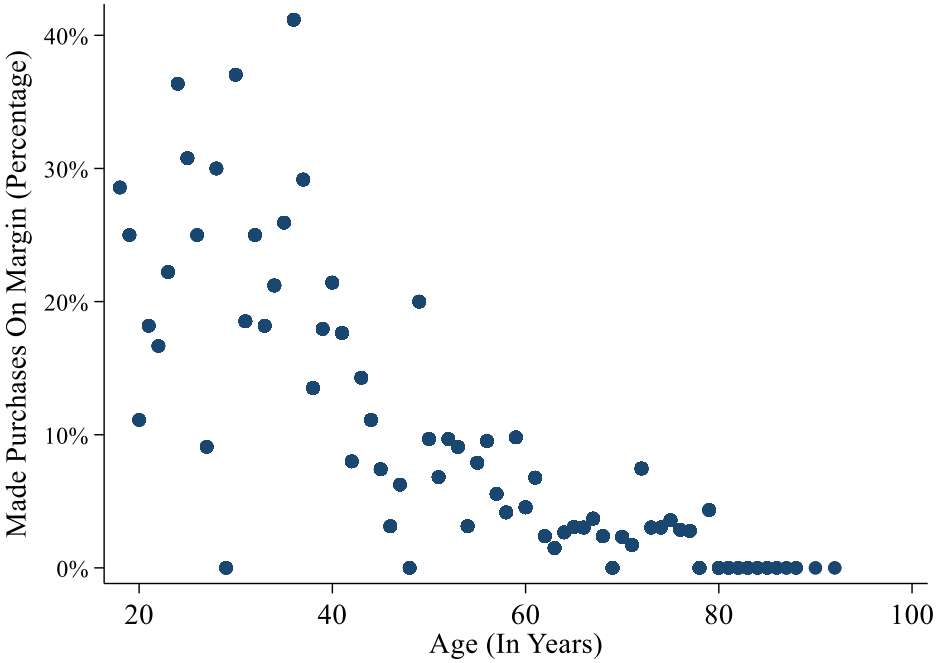


Figure 4. Percentage of Respondents who Made Purchases on Margin by Age



Probit Model Results

Marginal effects estimated from a probit regression model can be found in Table 2. Among the variables included in the model, peer influence appears to have one of the most substantive associations with making margin purchases. Relative to those who considered peer influence to "Not at all" describe why they invest, those who stated "Somewhat" and "Very well" had a significantly higher probability (0.096 and 0.163, respectively) of buying on margin. Especially for those who selected "7 Strongly agree" (0.136), having too much debt was associated positively with margin purchase, as was non-retirement account value. Willingness to take risk was positively associated with buying on margin, though only at the highest self-reported levels of risk tolerance (4/5 and 5/5). Age was associated negatively with margin purchase (-0.002) at a significant level, as was being widowed (-0.057) when compared with being single. No significant results were found based on gender or race/ethnicity.

Table 2. Results of Probit Model of Margin Purchasing (Marginal Effects)

	Marg. Eff./ (Std. Err.)
Why Invest: Peer Influence	
Not at all (Ref.)	
Somewhat	0.099***
	(0.020)
Very well	0.167***
	(0.032)
Investment Literacy Score	0.007**
	(0.003)
Expected Relative Portfolio Return	
Worse than market (Ref.)	
Same as market	0.000
	(0.025)
Better than market	0.045
	(0.026)
I have too much debt right now	
1 (Strongly disagree) (Ref.)	
2	0.023
	(0.025)
3	0.033
	(0.027)
4	0.048
	(0.025)
5	0.019
	(0.023)
6	0.059
	(0.037)
7 (Strongly agree)	0.138***
	(0.034)
Willingness to take risk	
1 (Not at all willing) (Ref.)	
2	-0.010
	(0.022)
3	0.042

	(0.024)
4	0.070***
	(0.023)
5 (Very willing)	0.110***
	(0.028)
Non-retirement account value	
< $2,000 (Ref.)	
$2,000-$5,000	0.024
	(0.016)
$5,000-$10,000	0.076***
	(0.028)
$10,000-$25,000	0.063***
	(0.023)
$25,000-50,000	0.062***
	(0.020)
$50,000-$100,000	0.094***
	(0.019)
$100,000-$250,000	0.107***
	(0.023)
$250,000-$500,000	0.077***
	(0.020)
$500,000-$1,000,000	0.119***
	(0.029)
$1,000,000	0.128***
	(0.030)
Gender	
Male (Ref.)	
Female	-0.005
	(0.015)
Age	-0.002***
	(0.001)
Race/Ethnicity	
White non-Hispanic (Ref.)	
Black non-Hispanic	0.021
	(0.027)
Hispanic (alone or in combination)	0.040
	(0.028)
Asian/Pacific Islander non-Hispanic	0.009
	(0.024)
Other non-Hispanic	0.004
	(0.041)
Marital status	
Single (Ref.)	
Married	0.020
	(0.015)
Divorced/Separated	0.021
	(0.028)
Widowed	-0.056*
	(0.023)

Note: Data from the 2021 NFCS Investor and State-by-State Surveys.
**** p < 0.001; ** p < 0.01 * p < 0.05*

Discussion

In several respects, the decision to make purchases on margin is not unlike the decision to make a real estate investment, where one borrows to purchase a property. The appropriateness of such an investment would be determined by the characteristics of the property as well as the terms of the loan. Certainly, using debt to buy real estate (as opposed to an outright cash purchase) increases the risk and opportunity of owning the property, but it would be unreasonable to assume that an investor is savvy or ignorant without considering all of the details of an investment.

In a similar vein, both a well-informed and an ignorant investor may use margin to pursue their goals, though likely with differing outcomes. Making investment or debt decisions based on peer influence is likely to result in biased decisions where risks and opportunities are misunderstood and where the information received from peers is seen to be more reliable or comprehensive than it actually is.

In agreement with observed trends in the descriptive statistics and correlation matrix (see Appendix B), a strong positive association between peer influence and buying on margin was found when controlling for other key variables. As making purchases on margin is both an investment and a debt decision, each of these factors is likely at play. The substantive, positive association found in this study aligns with previous findings, which suggest that there are ties between reliance on peer influence (i.e., peer effect, social influence, herding) and risky investment behavior (Frydman, 2015; Mylonidis & Oikonomou et al., 2021) as well as increased borrowing (Berlemann & Salland, 2016; Georgarakos et al., 2014). This is concerning, as such reliance may be accompanied by inferior financial outcomes. In addition, confirming the findings Xu (2023) which found that investors feel more certainty about their investment decisions when they imitate their peers, it is unsurprising to see that peer influence and confidence in one's ability to outperform the market are positively correlated (Appendix B).

There is a strong resemblance between Figures 3 and 4, which demonstrate the relationship between margin use and age, and peer influence and age, respectively. Marginal effects estimated from a probit model indicate a highly significant, negative relationship between margin use and age as well. At least visibly, the strongest correlations found were between peer influence and age, peer influence and buying on margin, and age and buying on margin (Appendix B). Though no significant results appeared in a separate model when including an interaction term between peer influence and age, these appear to be among the most important predictors of making margin purchases. In light of other findings, it is not surprising that these younger, less experienced, more heavily peer-influenced investors show a higher probability of borrowing on margin (Charles et al., 2013).

It is interesting to note the pattern of investment literacy among those who buy on margin relative to those who do not (see Figure 2). Though a small, positive linear association between investment literacy and margin use is found in the marginal effects (note the conflicting small, negative correlation in Appendix B), a different pattern emerges in Figure 2, showing that respondents who bought on margin had lower scores much more frequently, but also scored highly (10/11 and 11/11) slightly more frequently than those who did not. Though further research is warranted, this suggests that this tool might be used most commonly by those with relatively low and high degrees of investment literacy. Therefore, any policy enacted to protect investors from taking risks that are beyond their capacity or awareness should be carefully crafted so as not to create unreasonable barriers of access to margin use for those who are highly literate.

Additionally, this positive association between investment literacy and margin use deviates from the findings by Kim et al. (2022), who found these variables to be negatively associated when using the 2018 wave of the NFCS Investor Survey. It is possible that the association between investment literacy and margin use is not static. For example, interest rates were substantially lower during the collection of the 2021 data than they were when the 2018 data were collected. This difference in interest rates (i.e., the cost to invest using margin) will impact the decision to make purchases on margin. Another example of what could drive this difference in outcome is that

the outlook of the financial markets can vary dramatically. Whereas the choice to buy on margin may seem appropriate to savvy investors during one period (e.g., high anticipation of market volatility), they may be more reluctant to use margin during other periods. Also, the attractiveness of margin when compared with other debt options likely varies based on a host of factors (e.g., relative interest rates). Further exploration into this interesting topic would be beneficial.

A relatively strong, negative correlation between peer influence and investment literacy was found in this study (Appendix B). It is possible that individuals with higher degrees of investment literacy are less likely to feel the need to rely on the investment advice of peers (or that those who are less interested in relying on their peers feel a greater need to develop their financial knowledge). An exploration of whether investment literacy protects against herding/peer influence would be beneficial. Experimental studies exploring financial education and its impact on investment decisions in a controlled environment might yield valuable insights. Additionally, related to the findings of Khalid (2020) who found that financial self-efficacy mediated a negative association between herding and investment behavior, future studies could investigate the mediating role of financial self-efficacy on herding and margin use.

A substantive positive association between feeling over-indebted and buying on margin was only found among those who ranked their sense of having too much debt very highly (7/7). This indicates a higher probability of entering into or maintaining margin agreements in environments where individuals feel their resource constraints most heavily, and further confirms the argument that margin purchase involves a debt component. It is worrisome that those who feel so strongly about their over-indebtedness are borrowing using a tool that allows for easy and immediate investment of the proceeds of the loan, as they are most likely to feel a need to make large investment returns, but lack the capacity to bear the losses that are often associated with leverage.

The cross-sectional nature of these data represents a limitation, especially as peer influence was only recently added to the NFCS Investor Survey in 2021. Future research could strengthen the present study by observing individual margin behavior across time. To the best of our knowledge, there are no datasets tracking individual margin behavior longitudinally. Additionally, the manner in which these questions on margin use were asked may have been confusing to the respondents. For example, margin is typically required to be enabled on an account in order to place certain trades (e.g., selling options without owning the underlying security), but many of these transactions are completed without carrying a margin balance (using the cash balance within the account to complete the transaction).

Conclusions and Implications

Given the paucity of literature examining the factors that influence individual decisions to buy on margin, this paper examines factors that are associated with individual decisions to buy stocks and other assets on margin – more specifically, peer influence, investment literacy, and age. A key finding in the current study is that those who invest due to peer influence are more likely to buy on margin, which might indicate herding behavior. Within the context of previous research and herding theory, this study demonstrates the importance of improving awareness of the risks inherent in herding behavior, particularly when buying on margin. Financial professionals are encouraged to consider how they might educate their clients to protect against the adverse effects of peer influence, especially discouraging the practice of doubling down on herd-influenced bets using margin. For example, financial planners and advisors might consider adding questions to gauge susceptibility to peer influence to their intake process, focusing on this issue with those who seem to be most at risk. Additionally, for those more likely to display herding behavior, financial professionals might consider more frequent portfolio reviews, orienting clients towards a goal-focused rather than a peer-focused approach to portfolio management.

Furthermore, the relationship between investment literacy and buying on margin yielded an interesting result. While the probit analysis showed a positive association, the descriptive

statistics showed a negative association. Also, a negative association was found between investment literacy and peer influence, indicating that investors who have higher degrees of investment literacy are less likely to be susceptible to herding. This finding highlights the importance of improving investment literacy for investors through various investor education programs.

Another interesting finding is that respondents who rated themselves as being highly indebted were more likely to buy on margin. This finding further strengthens the argument that buying on margin is both a debt and an investment decision. These individuals could potentially be aided by policies that seek to provide just-in-time education about the risks and alternatives to margin use. Also, financial professionals could educate their clients that buying on margin is both a debt and an investment decision, which could be a beneficial framing.

Other factors positively associated with margin purchase include age, risk tolerance, and non-retirement portfolio values. Being widowed was negatively associated with buying on margin.

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APPENDIX

Appendix A. Investment Literacy Questions Used in Analysis (Correct Answers Bolded)

1. If you buy a company's stock…
    - **a. You own a part of the company**
    - b. You have lent money to the company
    - c. You are liable for the company's debts
    - d. The company will return your original investment to you with interest
    - e. Don't know
    - f. Prefer not to say
2. If you buy a company's bond…
    - a. You own a part of the company
    - **b. You have lent money to the company**
    - c. You are liable for the company's debts
    - d. You can vote on shareholder resolutions
    - e. Don't know
    - f. Prefer not to say
3. If a company files for bankruptcy, which of the following securities is most at risk of becoming virtually worthless?
    - a. The company's preferred stock
    - **b. The company's common stock**
    - c. The company's bonds
    - d. Don't know
    - e. Prefer not to say
4. In general, investments that are riskier tend to provide higher returns over time than investments with less risk.
    - **a. True**
    - b. False
    - c. Don't know
    - d. Prefer not to say
5. The past performance of an investment is a good indicator of future results.
    - a. True
    - **b. False**
    - c. Don't know
    - d. Prefer not to say
6. Over the last 20 years in the US, the best average returns have been generated by:
    - **a. Stocks**
    - b. Bonds
    - c. CDs
    - d. Money market accounts
    - e. Precious metals
    - f. Don't know
    - g. Prefer not to say
7. What is the main advantage that index funds have when compared to actively managed funds?
    - a. Index funds are generally less risky in the short
    - **b. Index funds generally have lower fees and expenses**
    - c. Index funds are generally less likely to decline in value
    - d. Don't know
    - e. Prefer not to say

8. Which of the following best explains why many municipal bonds pay lower yields than other government bonds?
    a. Municipal bonds are lower risk
    b. There is a greater demand for municipal bonds
    c. Municipal bonds can be tax-free
    d. Don't know
    e. Prefer not to say
9. You invest $500 to buy $1,000 worth of stock on margin. The value of the stock drops by 50%. You sell it. Approximately how much of your original $500 investment are you left with in the end?
    a. $500
    b. $250
    c. $0
    d. Don't know
    e. Prefer not to say
10. Which is the best definition of "selling short"?
    a. Selling shares of a stock shortly after buying it
    b. Selling shares of a stock before it has reached its peak
    c. Selling shares of a stock at a loss
    d. Selling borrowed shares of a stock
    e. Don't know
    f. Prefer not to say
11. If you own a call option with a strike price of $50 on a security that is priced at $40, and the option is expiring today, which of the following is closest to the value of that option?
    a. $10
    b. $0
    c. -$10
    d. Don't know
    e. Prefer not to say

Appendix B. Correlation Matrix of Key Variables

	Peer Influence	Age	Expected Performance	Investment Literacy	Bought on Margin
Peer Influence	1				
Age	-0.4532	1			
Expected Performance	0.1312	-0.0925	1		
Investment Literacy	-0.2186	0.1842	-0.0266	1	
Bought on Margin	0.3798	-0.2592	0.1732	-0.0361	1

Note: Data from the 2021 NFCS Investor and State-by-State Surveys.