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Article

Behavioral Intention, Personality and Consumer Credit Use

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Abstract

This paper examines how behavioral intention, combined with risk tolerance, financial confidence, and self-control, relates to consumer credit usage. Inspired by the Theory of Planned Behavior, which suggests that behavioral intention is the direct precursor to actual behavior, our study investigates how these financial personality traits moderate the relationship between intention and the uptake of consumer credit. Using a combination of survey and bank register data, we focus on the amount of outstanding balance on consumer credit as the objective measure of consumer credit behavior. The results show that higher risk tolerance and greater financial confidence both are associated with increased credit use among those with the intention to borrow, while self-control mitigates this relationship. We observe that gender differences in financial behavior are notable: men who report high confidence and an intention to use consumer credit tend to carry higher outstanding balance, whereas higher self-control in men is linked to lower credit use. Additionally, although string behavioral intention and higher income both predict greater consumer credit use, self-control mitigates this association among high-income individuals. Our study adds to consumer credit research by revealing the complex interplay between behavioral intention, risk tolerance, financial confidence, and self-control in relation to actual consumer credit usage.

Keywords: consumer credit; behavioral intention; risk tolerance; financial confidence; self-control

JEL-Codes: D12, D14, D91, G41

1. Introduction

The use of consumer credit has increased significantly in many countries over recent decades, facilitating household payments in advance of income but also contributing to over-indebtedness and financial vulnerability (Leandro and Botelho, 2022; Bartscher et al., 2020; Cavalletti et al., 2020; Costantini and Seccareccia, 2020). Rona-Tas and Guseva (2018) attribute this expansion to regulatory reform, industry innovations, and technological advances. Additionally, shifts in consumer spending patterns and growing preference for online shopping have contributed to increased demand for consumer credit.

Although consumer credit may not constitute the primary component of household borrowing, financial authorities report a strong link between over-indebtedness and arrears on hire purchases, a correlation less evident with mortgages and rent payments (European Union, 2023). The rising number of debt delinquencies underscores concerns about excessive consumer credit use (Federal Reserve Bank of New York, 2024; Bank of England, 2023; Swedish Financial Supervisory Authority, 2022).

Borrowing decisions are often intentional. Well-known behavioral theory such as the theory of planned behavior (Ajzen, 1991) and the behavioral perspective model (Foxall & Yani-de-Soriano, 2005) identified intention as the most immediate predictor of behavior. However, in practice, similar intentions can lead to deviated outcomes. While some individuals maintain modest credit balance,

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others may accumulate substantial debt and fall into over-indebtedness trap. This divergence raises our main concern regarding which factors correlate with borrowing intention translating into higher level of consumer credit use. We argue that the role of underlying financial personality traits moderate how intentions are implemented. Driven by the theory of planned behavior, this study incorporates key financial personality traits—risk attitude, financial confidence, and self-control—as moderators between intention and the amount of consumer credit use. The aim is to precisely identify individuals who are more likely to use consumer credit by their financial personality traits after controlling for demographic and socioeconomic factors. Identifying these consumers is of significant interest for policymakers and financial institutions aiming to design targeted interventions, promote responsible credit use, and mitigate the risks of over-indebtedness, thereby enhancing overall financial well-being.

From a psychological perspective, existing research has highlighted factors such as personality traits (Brown & Taylor, 2014; Wang et al., 2011), attitudes (Almenberg et al., 2021; Brown et al., 2013), sentiments (Gric et al., 2022), and financial confidence (Allgood & Walstad, 2016) as key determinants of consumer credit behaviors, in terms of costliness of credit card use, unsecured debt at household level, consumer loans use, self-reported revolving credit use, petty installment credit use, and debt-to-income level. Rooted on theoretical basis, Rutherford & Devaney (2009) applied the theory of planned behavior to explore convenience credit card use without directly measuring behavioral intention, and Xiao et al. (2011) applied the same theoretical framework with additional factors to examine risky credit behaviors among college students.

A critical gap remains in the literature regarding how financial personality traits shape the translation of borrowing intention into actual credit use. Specifically, existing literature has yet to adopt a structured framework that explains how these traits interact with behavioral intention and contextual conditions related to realized borrowing behavior. This limitation highlights the need for a more integrated theoretical approach that captures the mechanisms linking intention to action. Moreover, we study the real amount of consumer credit used, measured by outstanding balance on consumer credit from administrative bank data. This allows us to address the limitation of existing literature that relied on self-reported measures of credit use that may be subject to bias and measurement error.

We focus on the moderating roles of risk tolerance, financial confidence, and self-control, conceptualizing these traits as factors that influence the extent to which individuals act on their borrowing intentions. Although not exhaustive, these traits are important for understanding decision-making process around credit use. We emphasize the interaction between behavioral intention and these three traits to better capture the mechanisms underlying credit use. According to Ajzen (2011), financial personality traits function as background factors that indirectly shape intention and behavior through their effects on proximal determinants. Empirical findings, however, suggest that the influence of these dispositions may be moderate (Allen et al., 2005; Rhodes et al., 2002).

In addition, we explore the heterogeneity across individuals by incorporating gender and income as key contextual factors. These variables are related to both access to financial resources, and financial behavior preference, and may therefore condition how financial personality traits and behavioral intention translate into consumer credit use.

Specifically, the study is guided by two questions: (1) How do financial personality traits—specifically risk tolerance, financial confidence, and self-control in financial activities—correlate with consumer credit decisions? (2) Are there gender- and income-based differences in the relationships between personality characteristics and consumer credit behavior?

Our findings show that higher risk tolerance and greater financial confidence both are associated with increased credit use among those with the intention to borrow, while self-control mitigates this relationship. We further explore heterogeneity across individuals with gender and income: men who report high confidence and an intention to use consumer credit tend to carry higher outstanding

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balance, whereas higher self-control in men is linked to lower credit use. Self-control moderates the strong positive association between intention and credit use among high-income individuals.

This study contributes to the consumer credit literature by explicitly investigating the moderate effect of key financial personality traits between behavioral intention and the amount of outstanding consumer credit. By focusing on the interaction between intention and traits, we identify a key mechanism whereby risk tolerance and financial confidence amplify borrowing behavior, while self-control mitigates the association and plays a more conditional role. Empirically, we advance the literature by combining administrative data and information on financial personality traits to provide more precise evidence on how psychological characteristics shape actual financial outcomes. Segmenting the analysis by gender and income level further uncovers how these relationships differ across consumer groups. The study also extends the theory of planned behavior framework by recognizing the moderating role of personality traits between intention and behavior. These insights offer practical value for policymakers and financial institutions seeking to promote responsible credit use and better identify consumers at greater risk of accumulating unsustainable consumer credit.

The paper is structured as follows: Section 2 presents the theoretical framework and hypotheses. Section 3 describes the data and measurement methods. Section 4 presents the empirical results. Section 5 discusses the findings and suggests directions for future research. Finally, Section 6 provides the conclusion.

2. Hypothesis Development

This study is guided by the theory of planned behavior (Ajzen, 1985, 1991), a framework supported by substantial empirical evidence that posits behavior as function of behavioral intention, with intentions accurately predicted by attitudes toward the behavior, subjective norms, and perceived behavioral control. To predict behavior accurately, measures of behavioral intention should correspond to the specific behavior and remain stable over the time between intention assessment and behavior observation (Ajzen, 1991). Warshaw & Davis (1985) defined behavioral intention as the degree of commitment to performing or not performing a specific behavior, reflecting an individual's formulated plans.

In the consumer credit context, Xiao et al. (2011) studied risky credit card behavior among college students, proposing an extended model of planned behavior that includes parental socioeconomic status and financial knowledge, concluding that behavioral intention plays a primary role in risky credit behavior. Similarly, Rutherford & Devaney (2009) used the theory to explore factors influencing convenience and revolving credit card users. This study built on these well-established relationships to fill the gap between intention and behavior.

Individuals' financial personality traits—risk tolerance, financial confidence, and self-control—are essential to financial decision-making. These traits reflect an individual's financial mindset in the market and are found to have impact on financial activities. Although the theory of planned behavior considers these personal dispositions as background factors (Ajzen, 2011), evidence from Allen et al. (2005) and Rhodes et al. (2002) demonstrates their moderating effects. Risk tolerance, which reflects the level of uncertainty an individual is willing to accept (Grable, 2000; Hallahan et al., 2004), is a critical attitudinal factor influencing financial behavior across contexts. In the field of consumer credit, studies have shown that risk aversion negatively correlates with unsecured household debt and desired debt levels (Brown et al., 2013; Crook, 2001). Thus, the following hypothesis is suggested:

H1. *Risk tolerance positively moderates the association between borrowing intention and consumer credit use.*

Financial confidence, or perceived financial literacy, has also been shown to predict consumer credit use. Unlike objective financial literacy, which is measured through factual questions, subjective financial knowledge reflects how individuals perceive their financial knowledge level. Higher financial confidence implies greater confidence in one's perceived financial understanding. Studies

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have shown that perceived financial literacy affects credit card behaviors and is a stronger predictor of healthy credit card practices than objective financial knowledge (Allgood & Walstad, 2016, 2013).

To reduce risky credit behaviors, enhancing subjective financial knowledge has been suggested as a more efficient approach than increasing objective financial literacy level (Liu & Zhang, 2021; Xiao et al., 2011), indicating that perceived financial knowledge has a stronger influence on behavior. Tang & Baker (2016) found that financial confidence negatively correlates with the ratio of credit card debt-to-assets ratio. Similarly, Atlas et al. (2019) found that as objective financial knowledge increases, financial confidence becomes more strongly associated with credit card use, with overconfident individuals—those with high confidence but low objective knowledge—more likely to engage in risky, high-cost credit behaviors (Asaad, 2015). Accordingly, we hypothesized:

H2. *Financial confidence positively moderates the association between borrowing intention and consumer credit use..*

Self-control refers the attention people pay to their personal financial activities, a concept which is significant in consumer behavior research (Baumeister, 2002). This sense of conscientiousness has been associated with financial behaviors; Donnelly et al. (2012) found that higher conscientiousness correlates with better money management skills related to credit card debt. Conscientiousness is inversely associated with the likelihood of holding credit card debt (Brown & Taylor, 2014) and the likelihood to be in debt (Webley & Nyhus, 2001). Lack of self-control found to be a key driver of over-indebtedness, as those with self-control issues are more likely to rely on high-cost credit and face financial shocks (Gathergood, 2012). Likewise, Achtziger et al. (2015) found a negative association between self-control and self-reported debt levels. Thus, we hypothesized that:

H3. *Self-control negatively moderates the association between borrowing intention and consumer credit use..*

Building on our hypotheses, we further examine whether gender and income level moderate the effects of behavioral intentions and financial personality on consumer credit use. Gender differences are well-documented in financial behavior, including credit card use (Hayhoe et al., 2000), over-indebtedness (Meyll & Pauls, 2019), costly credit behavior (Mottola, 2013), debt attitudes (Almenberg et al., 2021), risk aversion (Jianakoplos & Bernasek, 1998), and perceived financial confidence (Lind et al., 2020). Additionally, income level has been associated with consumer credit amounts, with higher-income individuals typically holding more consumer credit due to greater access and repayment capacity (Chien & Devaney, 2001; Stavins, 2020). Based on these empirical findings, we propose following hypotheses:

H4. *The associations between borrowing intention, financial personality traits, and consumer credit use differ by gender.*

H5. *Higher-income individuals carry more outstanding consumer credit balance than lower-income individuals with the same level of borrowing intention and financial personality traits.*

3. Data

3.1. Data Collection

Data were collected in 2013 from one of Sweden's largest retail banks (hereafter referred to as the Bank), which holds approximately 20% of the Swedish retail market. The Bank's customer structure is similar to that of the country's other three major banks. Two types of data were used: anonymized data from the Bank's register of individual retail customers ("register data") and data from a survey administered to a subset of these customers ("survey data").

The random sample for the study included 90,528 of the Bank's 2,254,420 Swedish customers. Customers were eligible if they had an active engagement with the Bank and were 18 years or older.

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The register data also included individual-level demographic and socioeconomic information (age, gender, geographical location, income, financial assets, loans, and mortgages) recorded in December 2013. This December 2013 register data aligns with the timing of the survey data, allowing for consistency in the main analysis.

In March 2013, all customers in the register sample received a questionnaire. To ensure independence from the Bank, an academic institution served as both the sender and receiver of the responses. No follow-up reminders were sent, and the survey achieved a response rate of 17.7%, which is consistent with similar studies (Lusardi, 2011; Kramer, 2016).

The questionnaire included questions about respondents' financial situation and financial literacy. Additionally, it gathered demographic and socioeconomic information, such as marital and family status, education, employment, and housing status. Surveys from respondents who reported being customers of multiple banks were excluded to approximate each respondent's total financial wealth accurately. In Sweden, taxation is carried out at the individual, rather than the household level. Financial wealth was defined as the total amount invested through the Bank in savings accounts (deposits), mutual funds, and stocks. The final sample, for which data were available for all variables, included 11,005 respondents. (See Table 1 for summary statistics) A comparison of the survey data with the register data and general Swedish population data[1] shows that the sample broadly represents the Swedish population, though survey respondents are somewhat older, wealthier, and better educated. Thus, designed regression models control for age, wealth and education, and other relevant factors.

Table 1. Descriptive summary.

Variables	Mean	Std.Dev.	Min.	Max.
ln(Credit)	1.418	3.701	0	16.215
Behavioral intention (BI)	0.166	0.372	0	1
Risk tolerance (R)	0.031	1.272	-2.069	2.747
Financial confidence (FC)	0.019	0.81	-2.349	1.188
Self-control (SC)	0.036	0.92	-2.441	1.471
Age				
18-30 yrs	0.089	0.285	0	1
31-44 yrs	0.165	0.371	0	1
45-60 yrs	0.31	0.462	0	1
61-74 yrs	0.335	0.472	0	1
above 75 yrs	0.101	0.301	0	1
Gender	0.487	0.5	0	1
Residential	0.371	0.754	0	1
ln(Income)	8.716	3.038	0	14.484
Not_MEM	0.132	0.338	0	1
ln(Wealth)	11.972	2.169	0	17.557
ln(Mortgage)	4.979	6.467	0	17.974
Attitude toward credit	0.24	0.427	0	1
Work status				

[1] Data on the Swedish population are collected from Statistics Sweden (SCB) www.scb.se.

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Full time	0.478	0.5	0	1
Long sick leave	0.008	0.091	0	1
Pre-retired	0.025	0.155	0	1
Retired	0.323	0.468	0	1
Unemployed	0.027	0.162	0	1
Student	0.031	0.173	0	1
Part time	0.108	0.311	0	1
Education				
No formal education	0.083	0.276	0	1
Pre-gymnasial	0.109	0.312	0	1
Gymnasial	0.271	0.444	0	1
Post-gymnasial <3 yrs	0.208	0.406	0	1
Post-gymnasial =>3 yrs	0.329	0.494	0	1
Housing				
Secondhand	0.016	0.126	0	1
Rental apartment	0.195	0.396	0	1
Condominium	0.21	0.407	0	1
Villa	0.58	0.494	0	1
Family status				
Single	0.222	0.416	0	1
Single with children	0.039	0.194	0	1
Couple without children	0.29	0.454	0	1
Couple with children	0.449	0.497	0	1
Objective financial literacy				
0 correct answers	0.19	0.392	0	1
1 correct answer	0.238	0.426	0	1
2 correct answers	0.171	0.377	0	1
3 correct answers	0.145	0.352	0	1
4 correct answers	0.118	0.323	0	1
5 correct answers	0.083	0.276	0	1
6 correct answers	0.054	0.226	0	1

3.2. Measurements of Variables

An Ordinary least squares (OLS) linear model is used to examine the relationship between sets of independent variables and consumer credit behavior. Below, we describe the measurements for the dependent, independent, and control variables. Table 1 provides descriptive statistics for each variable, including the means, minimum, and maximum values.

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3.2.1. The Dependent Variable

The dependent variable is the amount of outstanding balance on consumer credit as of December 2013, derived from official bank register data. The consumer credit includes all forms of credit held by the bank customers, excluding mortgages. The outstanding balance reflects the amount of credit still owed at the end of the year, offering a concrete measure of actual borrowing behavior rather than credit access or self-reported credit usage.

3.2.2. Independent Variables

Behavioral Intention (BI) toward using credit is measured using the statement "For a larger expenditure (excluding real estate), I'd rather save first than take up a loan". Responses are indicated on a seven-point Likert scale, ranging from 1 (=totally disagree) to 7 (=totally agree). A dummy variable captures those intend to use credit instead of saving first (answers from 1 to 3 on the Likert scale).

Risk tolerance (R) is measured through statements "I can accept losing part of my saving if the chance of getting a good return is great", "I think one has to take risk to gain something", "I would like to increase risk because the return is too low". Responses are indicated on a seven-point Likert scale. Factor loadings, item reliability, composite reliability, and Average Variance Extracted (AVE) are consisted with recommended levels.

Financial confidence (FC) is captured by the statement "I have the knowledge to handle my economic situation in a good way", "I understand the risks I take with my investment", and "I save only in saving products I understand". Responses are indicated on a seven-point Likert scale, with factor loadings, item and composite reliability, and AVE meeting recommended standards.

Self-control (SC) is assessed with statements: "I review my savings quarterly", "I prepare before meeting a financial advisor", and "I believe it is important to maintain good control over my savings". Responses are indicated on a seven-point Likert scale, with factor loadings, item and composite reliability, and AVE meeting recommended standards.

Table 2 displays the correlation matrix for the independent variables. All correlations are below 0.5 in absolute value, except for the correlation between financial confidence and self-control, which shows a moderate positive relationship (0.502). This association may reflect findings in previous research that suggest financial confidence can be elevated to offset limited self-control (Bénabou & Tirole, 2002).

Table 2. Correlation matrix.

	BI	R	FC	SC	G
R	-0.075				
FC	-0.194	0.261			
SC	-0.197	0.249	0.502		
G	0.045	0.230	0.155	0.054	
I	-0.008	0.012	0.021	0.025	0.024

Note: Behavioral intention (BI), Risk tolerance (R), Financial confidence (FC), Self-control (SC), Gender (G), Income (I).

3.2.3. Control Variables

Control variables include age, gender, residence in one of Sweden's three largest cities (Stockholm, Malmö and Gothenburg), income, mortgage debt, wealth, employment status, family status, housing, education, attitude toward credit, and objective financial literacy. Empirical findings have suggested that age, gender, income, household size, marital status, education level, and employment status are found to be significantly correlated with consumer credit behaviors such as, unsecured debt (Brown and Taylor, 2014; Chien & Devaney, 2001; Rutherford & Devaney, 2009;

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Stavins, 2020), the extent of responsible credit card use (Atlas et al., 2019), and revolving credit use (Wang et al., 2011).

The average age of the sample is 54.8 years (SD =16.3), which is higher than both the bank register data average (49.7 years) and the overall Swedish average (41.2 years). It is important to note that the national average includes individuals younger than 18, while our sample only includes those aged 18 or older.

Gender (coded as men = 1, women = 0) has a mean of 0.47, indicating a slightly higher proportion of women in the sample. One-third of the sample—and the general population—reside in the three major cities (mean = 0.32). The average monthly net income after tax was SEK 17,817 in December 2013, aligning with the national income distribution when considering the sample's age structure. The natural logarithm of total income is used for analysis. Not_MEM is a variable capturing customer who report struggling to make ends meet, i.e., those whose salary is depleted before the next pay period.

In terms of financial wealth, the sample average SEK 493,906 in 2013, with a standard deviation of SEK 1.0 million. This figure is higher than both the Swedish national average (SEK 305,000) and the average in the bank register data (SEK 317,000). The natural logarithm of total financial wealth is used in the analysis.

Employment status is categorized into seven options: working full- or part-time, pre-retired, retired, long-term sick leave, student, or unemployed. Full-time employment is the most common status (56%). The sample includes a higher proportion of retirees compared to the general population, consistent with the sample's age profile.

Family status options include single, in a relationship (including marriage), and with or without children. The most common status is being in a relationship with children (49%). Housing status is categorized into renting second-hand, rental apartment, tenant-owned apartment, or house. The predominant status is house ownership. Compared to the general Swedish population, the sample has a lower proportion of rental apartment residents (20% versus 30%) and single-family home residents (39% compared with 43%).

Education is classified into five levels, ranging from no formal education to post-secondary education of three years or more. The most common level in the sample is upper secondary education. Relative to the national average, the sample has a lower proportion with only upper secondary education (29% versus 45%) and a higher proportion with post-secondary education (49% versus 34%), indicating that the sample is more highly educated than the general population.

Objective financial literacy is assessed through a six-question quiz covering basic financial concepts like inflation and risk diversification (e.g., Anderson, Baker, and Robinson, 2017; Lusardi, 2008). The questions were tailored to the Swedish context, differing somewhat from those used by, for example, Anderson et al. (2017) and Lusardi (2008). Given the Swedish population's significant homeownership (62%) and common use of variable-rate mortgages, understanding inflation, the Riksbank's inflation target, as well as nominal versus real interest rates, is particularly relevant.

Moreover, about 32% of Swedes invest directly in stocks and 80% in mutual funds, while direct bond investment is less common (8%, per the Swedish Investment Fund Association, 2016).[2] Therefore, knowledge of mutual fund risk levels and the relative risk of equity versus balanced or fixed-income funds is crucial. Other pertinent concepts include the price/earnings (P/E) ratio and equity-linked securities, which have historically been profitable and widely marketed by Swedish banks. Gunnarsson and Wahlund (1997) also employ this context-driven approach for measuring financial literacy in Sweden. The exact wording of the quiz is provided in Table A.1 in the Appendix A.

[2] This includes only direct private saving and not pension savings managed by the pension system.

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4. Empirical Analysis

4.1. Risk Tolerance, Financial Confidence, and Self-Control

To assess the effect of intention to use credit use, conditional on consumers' risk tolerance, financial confidence, and self-control in financial activities (Equation 1), we estimate the following model:

$$\ln(Credit_i) = \alpha + \beta_1 BI_i + \beta_2 P_i + \beta_3 BI_i \times P_i + \Sigma_k a_k^Z Z_{ki} + \varepsilon_i \quad (1)$$

where P_i is the measured individual i's financial personality traits: risk tolerance, financial confidence, and self-control.

The first column of Table 3 shows the results for the independent effects of the three financial personality variables (Full results with control variables are in Appendix B Table B.1). Risk tolerance has a positive association with consumer credit behavior at the 5% significance level, while financial confidence shows a positive relationship at 10% significance. Self-control, however, is not significantly associated with consumer credit use.

Subsequent columns in Table 3 present the results of models that include interaction terms. In the full interaction model, the interaction of credit use intention with risk tolerance is statistically significant at the 5% level, indicating that among consumers with an intention to take on credit for purchases, those with higher risk tolerance tend to use greater amounts of consumer credit. A similar relationship is observed for the interaction between credit use intention and financial confidence: among individuals intending to buy on credit, a higher degree of confidence in one's ability to manage personal finances is associated with increased credit use. Contrast to the positive associations with risk tolerance and financial confidence, results in column 5 shows that higher self-control mitigates the relationship between credit use intention and actual consumer credit accumulation.

Table 3. Effects of interaction of behavioral intention with risk tolerance, financial confidence, and self-control on consumer credit use.

Variables: ln(Credit)	(1)	(2)	(3)	(4)	(5)
Behavioral intention (BI)	0.9004***	0.9196***	0.9585***	0.8905***	0.9301***
	(0.1169)	(0.1185)	(0.1221)	(0.1201)	(0.1217)
Risk tolerance (R)	0.0622**	0.0305	0.0610**	0.0624**	0.0320
	(0.029)	(0.0294)	(0.029)	(0.029)	(0.0294)
Financial confidence (FC)	0.0822*	0.0758	0.0261	0.0837*	0.0115
	(0.0497)	(0.0497)	(0.0512)	(0.0498)	(0.051)
Self-control (SC)	-0.0475	-0.0506	-0.0506	-0.0394	-0.0012
	(0.0437)	(0.0437)	(0.0437)	(0.0452)	(0.0454)
BI × R		0.1859**			0.1764**
		(0.0846)			(0.0889)
BI × FC			0.2477**		0.3279**
			(0.1170)		(0.1434)
BI × SC				-0.0410	-0.2712**
				(0.1041)	(0.1282)
Control variables	Yes	Yes	Yes	Yes	Yes
Constant	1.2860***	1.3001***	1.3017***	1.2821***	1.2940***
	(0.3285)	(0.3285)	(0.3286)	(0.3289)	(0.3293)

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Observation	11,005	11,005	11,005	11,005	11,005
R-squared	0.1193	0.1199	0.1198	0.1193	0.1206

Robust standard errors are reported in parentheses; ***p< 0.01, **p<0.05, *< 0.1.

4.2. Gender Difference and Income Difference Analyses

To test H4 and H5, we conducted a series of three-way interaction regression analyses where interaction terms of behavioral intention with financial personality variables were separately interacted with gender *(G)* and income level *(I)*. This approach allowed us to examine how the relationship between each interaction term and the amount of consumer credit used varies by gender and income, specifically for individuals who intend to use credit. The models are specified as follows:

$$\ln(Credit_i) = \alpha + \beta_1 BI_i + \beta_2 P_i + \beta_3 G_i + \beta_4 BI_i \times P_i + \beta_5 BI_i \times G_i + +\beta_6 P_i \times G_i + \beta_7 BI_i \times P_i \times G_i + a_k^Z Z_{ki} + \varepsilon_i \quad (2)$$

$$\ln(Credit_i) = \alpha + \beta_1 BI_i + \beta_2 P_i + \beta_3 I_i + \beta_4 BI_i \times P_i + \beta_5 BI_i \times I_i + \beta_6 P_i \times I_i + \beta_7 BI_i \times P_i \times I_i + a_k^Z Z_{ki} + \varepsilon_i \quad (3)$$

Results for Equation (2) are presented in Table 4 column 1. The findings reveal that the moderating roles of financial confidence and self-control in the association between intention and credit use differ significantly between men and women. There is a significant positive three-way interaction term between behavioral intention, financial confidence, and gender. This suggests that the association between intention to use credit and consumer credit use is influenced by financial confidence for men. While for women, financial confidence does not moderate the intention and credit use relationship. As illustrated in Figure 1, a simple slope analysis further reveals that the slope for men with high behavioral intention differs significantly from other combinations, indicating that the effect of behavioral intention on consumer credit use is particularly pronounced for men with high financial confidence.

Additionally, the results indicate that gender moderates the relationship between self-control and consumer credit use. The significant negative coefficient for the three-way interaction between intention, gender, and self-control suggests that self-control weaken the relationship between intention and credit use more pronouncedly for men than for women. Overall, none of the three financial personality traits significantly moderate the intention and credit use relationship for women.

Table 4. Three-way interaction analysis accounting for gender and income.

Variables:	(1)	(2)
ln(Credit)	Gender	Income
Behavioral intention (BI)	0.8958***	0.9553***
	(0.1255)	(0.1237)
Risk tolerance (R)	0.0313	0.0903***
	(0.0382)	(0.0317)
Financial confidence (FC)	-0.0277	0.0566
	(0.0610)	(0.0530)
Self-control (SC)	0.1497***	-0.0166
	(0.0555)	(0.0487)
Gender (G)	0.2095***	0.1624**
	(0.0764)	(0.0750)
Income (I)		0.4305***
		(0.0847)
BI × R	0.1431	0.2508**
	(0.1226)	(0.1105)

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BI × FC	0.1397	0.4187**
	(0.1763)	(0.1634)
BI × SC	-0.1662	-0.1051
	(0.1600)	(0.1440)
R × G / I	0.0079	-0.1222**
	(0.0561)	(0.0574)
FC × G / I	0.0804	-0.1078
	(0.1047)	(0.1052)
SC × G / I	-0.3261***	0.0344
	(0.0905)	(0.0932)
BI × R × G / I	0.1935	-0.0097
	(0.1280)	(0.1322)
BI × FC × G / I	0.6033***	0.0673
	(0.2208)	(0.2280)
BI × SC × G / I	-0.6666***	-0.4744**
	(0.1913)	(0.2107)
Control variables	Yes	Yes
Constant	1.2527***	1.6642***
	(0.3302)	(0.3308)
Observation	11,005	11,005
R-squared	0.1222	0.1233

Robust standard errors are reported in parentheses; ***p< 0.01, **p<0.05, *< 0.1. Column 1 shows results of three-way interaction with gender; column 2 shows results of three-way interaction with income.

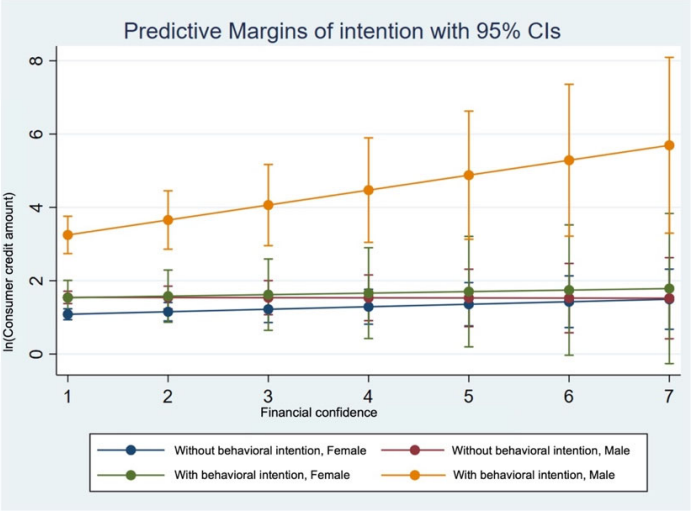

Figure 1. Predictive margins of three-way interaction (BI × FC × G).

To examine differences in consumer credit use across income levels, we divide the sample into two groups: above-median income and below-median income. Results for Equation (3) are shown in Table 4 column 2. Consistent with previous studies indicating that consumer credit use increases with income (Stavins, 2020), income is significantly and positively related to consumer credit use. Our

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findings further confirm that the difference in credit use between individuals of different income levels persists among those with the intention to use consumer credit.

A statistically significant relationship is observed in the three-way interaction term involving behavioral intention, self-control, and income level. The negative coefficient of this interaction term indicates that the positive association between behavioral intention and consumer credit use is weaker when both self-control and high income are taken into account. As shown in Figure 2, the extent of attention paid to financial activities moderates the relationship between behavioral intention and credit use, especially for high-income individuals.

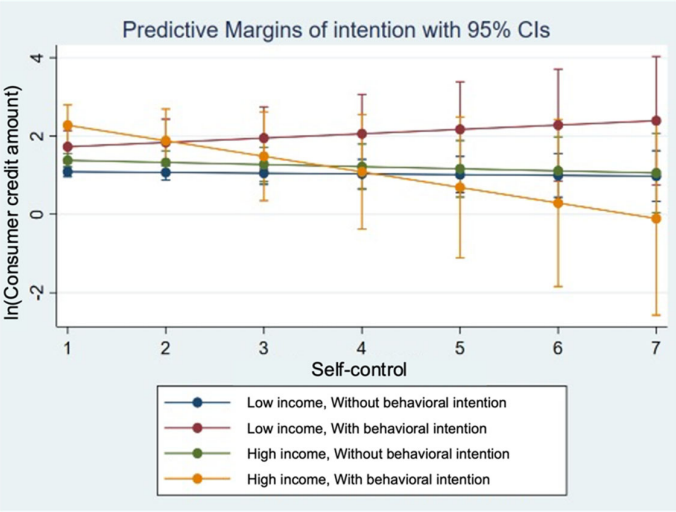

Figure 2. Predictive margins of three-way interaction (BI × SC × I).

To further validate the three-way interaction findings, we conduct a complementary subgroups analysis by splitting the sample by gender and income level. Results are presented in Appendix B Table B.2. Both subgroup analyses show consistent results with the three-way interaction analyses.

5. Discussion

Our findings confirm that financial personality traits meaningfully condition how behavioral intention relates to actual consumer credit accumulation. The moderating roles of risk tolerance, financial confidence, and self-control emerge when all three traits are modeled simultaneously.

We find that both risk tolerance and financial confidence are positively and significantly associated with the amount of outstanding consumer credit. Taking on consumer credit involves risk, as missed payments and additional fees may arise when there is a mismatch between credit use and the individual's financial repayment capacity. Consistent with previous studies (Brito & Hartley, 1995; Brown et al., 2013), our results suggest that individuals with higher risk tolerance are more likely to hold credit balances, reflecting an appeal of credit products to those who are willing to assume greater financial risks for immediate access to goods and services.

Similarly, perceived financial knowledge is found to strengthen the association between behavioral intention and credit behavior. Consumers with high behavioral intention and high perceived financial knowledge constitute a distinct segment more likely to engage in greater credit use. As with outstanding balances, this greater credit use implies a greater tendency to delay payment. While previous research has linked financial confidence to healthy credit card practices (Atlas et al., 2019), our study extends this by showing an association between financial confidence and the volume of deferred payment. Further, a three-way interaction analysis reveals that men with higher financial confidence and strong intention to use credit are especially likely to finance purchases through consumer credit. For women, financial confidence does not strengthen the intention-behavior relationship. Although this study examines total consumer credit use rather than risky borrowing

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behavior, the observed trend of rising borrowing amounts alongside greater financial confidence warrants attention. Educational programs on healthy borrowing practices may prevent overconfidence-driven credit overuse and repayment difficulties. Such campaigns should also provide guidance on managing financial distress.

In contrast, higher self-control corresponds to a weaker relationship between behavioral intention and consumer credit use. However, this effect does not appear in partial specification when the interaction is included in the model alone, it only shows when the amplifying effects of risk tolerance and financial confidence are simultaneously controlled. The negative three-way interaction results in Table 4 further reveal that self-control's inverse association with credit use is stronger for men, whereas no such association is evident for women. This finding contributes to the gender perspective in research linking conscientiousness with money management (Donnelly et al., 2012). Given that men are slightly more likely to face repayment challenges (EU, 2023), our findings suggest that promoting conscientious financial behavior could encourage men to borrow less, potentially reducing their likelihood of arrears. Furthermore, among high-income individuals with an intention to use credit, greater self-control corresponds to reduced borrowing. This highlights a gap between behavioral intention and actual behavior, wherein personality traits such as conscientiousness can modulate intention's predictive power for certain groups (in this case, high-income individuals). However, it is important to acknowledge a limitation in our self-control variable's measurement. Specifically, our variable captures individual carefulness regarding financial activities but does not directly address borrowing behavior, which may impact the accuracy of the observed relationship between self-control and consumer credit use.

Our findings suggest that financial personality traits moderate the effect of behavioral intention on consumer credit behavior. When the consumer credit behavior is measured by the outstanding balance, the correlation between intention and action varies by individual traits such as risk tolerance and financial confidence. This finding offers a new perspective on background factors' roles. While Ajzen (2011) posited that such dispositions indirectly influence intention and behavior by affecting proximal determinants, they may also act to act as moderators between intention and action. Similarly, Rhodes et al. (2002) found that Big Five personality traits moderate intention-behavior links in exercise contexts, while Allen et al. (2005) suggested self-monitoring and risk aversion moderate intention-actual behavior links in job quitting contexts. Our study contributes empirical evidence from the consumer credit field, illustrating how financial personality traits moderate the connection between intention and the intensity of credit use.

Despite this study's contributions, certain limitations remain. To better capture self-control's effect on consumer credit use, future research could incorporate measures specifically addressing borrowing behaviors, such as impulsive spending with credit, credit management, and awareness of credit limits. Conceptually, we anticipate that self-control would show a significant negative relationship with credit use volume when conscientiousness about credit-based spending is accounted for. Additionally, the outstanding balance in consumer credit is used as the proxy for consume credit behavior, which serves as a practical measure of payment deferral but not directly capture repayment ability. As the issue of financial distress arise when borrowers cannot meet their repayment obligations, to better identify over-indebted individuals from a psychological perspective, future research should measure unmanageable debt (e.g., the portion of credit unpaid) and its association with key financial personality traits. Such insights could deepen understanding of consumer credit misuse within behavioral finance.

6. Conclusions

The marked increase in consumer credit usage observed in numerous countries highlights the importance of identifying consumers who are more likely to engage in credit purchases. Understanding these consumer characteristics is essential to prevent potential misuse, which could lead to serious financial issues and broader economic instability. By investigating the moderating effects of risk tolerance, financial confidence, and self-control on the relationship between behavioral

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intention and actual consumer credit use, we identify that risk tolerance and financial confidence amplify the positive relationship between borrowing intention and consumer credit accumulation.

Furthermore, when examining gender differences in financial behavior, our findings reveal that men with higher confidence tend to spend more using consumer credit, particularly when they have a strong intention to use credit. The mitigate effect if self-control on the intention and credit use relationship is similarly gender specific. For women, none of the three financial personality traits are found to moderate the intention-credit use relationship. With respect to income heterogeneity, we find that higher self-control mitigates consumer credit use among high-income individuals who intend to use credit. Conversely, this result implies that low-income individuals with similar levels of conscientiousness and behavioral intention may accumulate balances similar to their higher-income counterparts. This behavior is concerning, as it suggests that financially less capable individual may behave similarly to those with more financial resources, potentially increasing their vulnerability to debt cycles that are challenging to escape due to limited financial capacity.

Our study contributes to consumer credit behavior research in several ways. First, unlike existing studies that rely on self-reported credit usage data, we use bank register data on actual outstanding consumer credit balance as the outcome variable, offering a more reliable basis for examining consumer credit behavior. Second, we explicitly measure how financial personality traits are linked to increased credit usage by analyzing interactions between behavioral intention and financial personality traits, showing that financial personality traits can serve as direct moderators of the intention-behavior pathway. Third, our three-way interaction analysis reveals differences across gender and income groups in how financial personality traits relate to consumer credit use. These insights are valuable for identifying potentially risky credit users and for highlighting key factors that promote healthy borrowing behavior. Lastly, from a theoretical perspective, this study suggests that within financial behavior, financial personality traits may serve as moderators between behavior intention and actual behavior in the theory of planned behavior framework.

Appendix A

Table A1. Financial literacy questions:.

	Question formulation
(1)	How high is the Riksbank's inflation target? (i)1.0% (ii)2.0% (iii) 3% (iv) Do not know
(2)	If there is a risk that the inflation will exceed the inflation target, what should the Riksbank do? (i) Lower the repo rate (ii) Raise the repo rate (iii) Do nothing (iv) Do not know
(3)	If the nominal interest rate is 5%, and the expected inflation is 2%, how high will the real interest rate be (approx.)? (i) 2.5% (ii)3.0%, (iii) 7.0% (iv) Do not know
(4)	A savings product where you will receive a guaranteed amount at maturity, and the return follows the equity market, is called: (i) Equity fund (ii)Hedge fund (iii) Equity-linked security (iv) Do not know
(5)	Mutual funds have different risk levels; which of these mutual fund types is generally viewed as having the highest risk? (i) Balanced fund (ii) Bond fund (iii) Equity fund (iv) Do not know
(6)	The definition of the P/E-ratio is (i) Price per share divided by earnings per share (ii) Price per share divided by own capital per share (iii) Price per share divided by sales per share (iv) Do not know

Note: The financial literacy questions, in the same order as posed in the questionnaire.

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Appendix B

Table B1. Full results including control variables.

Variables: ln(Credit)	(1)
Behavioral intention (BI)	0.9004***
	(0.1169)
Risk tolerance (R)	0.0622**
	(0.029)
Financial confidence (FC)	0.0822*
	(0.0497)
Self-control (SC)	-0.0475
	(0.0437)
Age	
31-44 yrs	0.4822***
	(0.1830)
45-60 yrs	0.6693***
	(0.1561)
61-74 yrs	0.6040***
	(0.1360)
above 75 yrs	0.1779**
	(0.0783)
Gender	0.1882**
	(0.0749)
Residential	-0.1392***
	(0.0425)
ln(Income)	0.0635***
	(0.0105)
Not_MEM	0.6406***
	(0.1227)
ln(Wealth)	-0.1450***
	(0.0175)
ln(Mortgage)	0.1105***
	(0.0065)
Attitude toward credit	0.2845***
	(0.0887)
Work status	
Long sick leave	-0.3624
	(0.4217)
Pre-retired	-0.7319***
	(0.1974)
Retired	-0.6434***

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	(0.1138)
Unemployed	-0.9083***
	(0.1992)
Student	-1.4274***
	(0.1467)
Part time	-0.6373***
	(0.1096)
Education	
Pre-gymnasial	0.1175
	(0.1343)
Gymnasial	0.0247
	(0.1281)
Post-gymnasial <3 yrs	0.0640
	(0.1307)
Post-gymnasial =>3 yrs	-0.2992**
	(0.1243)
Housing	
Rental apartment	0.8753***
	(0.2035)
Condominium	0.4960**
	(0.2163)
Villa	0.3466
	(0.2172)
Family status	
Single with children	0.0699
	(0.2266)
Couple without children	-0.0320
	(0.0910)
Couple with children	-0.0644
	(0.0992)
Objective financial literacy	
1 correct answer	0.0075
	(0.1052)
2 correct answers	-0.0510
	(0.1155)
3 correct answers	-0.0579
	(0.1261)
4 correct answers	-0.0518
	(0.1328)
5 correct answers	0.0346
	(0.1521)
6 correct answers	0.0121

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	(0.1808)
Constant	1.2860***
	(0.3285)
Observation	11,005
R-squared	0.1193

Robust standard errors are reported in parentheses; ***p< 0.01, **p<0.05, *< 0.1.

Table B2. Gender and income groups analysis.

Variables:	(1)	(2)	(3)	(4)
ln(Credit)	Men	Women	High income	Low income
Behavioral intention (BI)	1.1750***	0.5832***	1.0513***	0.7304***
	(0.1800)	(0.1702)	(0.1833)	(0.1595)
Risk tolerance (R)	0.0302	0.0537	-0.0024	0.0983***
	(0.0447)	(0.0386)	(0.0513)	(0.0317)
Financial confidence (FC)	0.0863	-0.0349	-0.0228	0.0264
	(0.0894)	(0.0615)	(0.0940)	(0.0531)
Self-control (SC)	-0.1438*	0.1190**	0.0970	-0.0724
	(0.0741)	(0.0560)	(0.0812)	(0.0483)
Gender (G)			0.2098	0.1064
			(0.1281)	(0.0846)
ln(income)	0.0583***	0.0705***	0.0822	0.0415***
	(0.0172)	(0.0118)	(0.1858)	(0.0118)
BI × R	0.1276	0.0644	0.0554	0.1989*
	(0.1302)	(0.1268)	(0.1372)	(0.1117)
BI × FC	0.5237**	0.0410	0.2485	0.3603**
	(0.2300)	(0.1766)	(0.2422)	(0.1638)
BI × SC	-0.2478**	-0.1812	-0.3769*	-0.1590
	(0.1988)	(0.1586)	(0.2218)	(0.1428)
Control variables	Yes	Yes	Yes	Yes
Constant	1.7271***	0.7357*	4.8307**	0.7055**
	(0.5176)	(0.4071)	(1.9319)	(0.3563)
Observation	5,360	5,645	5,505	5,500
R-squared	0.1296	0.1039	0.1208	0.1049

Robust standard errors are reported in parentheses; ***p< 0.01, **p<0.05, *< 0.1.

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