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The Role of Overconfidence on Online Overdebt Behavior

Ascaryan Rafinda[1]*, Putri Purwaningtyas[2], Juli Riyanto Tri Wijaya[3], Hasan Aljafa[4], Christian Rotimi Barika[5], Annisa Ilma Hartikasari[6]
[1,2] Faculty of Economics and Business, Jenderal Soedirman University, Purwokerto, Indonesia
[3] Faculty of Economics and Business, Pancasakti Tegal University, Tegal, Indonesia
[4] Department of Management and Enterprises, University of Debrecen, Egyetem tér 1, 4032, Hungary
[5] University of Jyväskylä, Seminaarinkatu 15, 40014 Jyväskylän yliopisto, Finland
[6] Accounting Department, National Yunlin University of Science and Technology, Taiwan

ORCIDs:
First AUTHOR : https://orcid.org/0000-0001-6636-4243
Second AUTHOR : https://orcid.org/0009-0003-9288-0868
Third AUTHOR : https://orcid.org/0009-0003-7673-2320
Fourth AUTHOR : https://orcid.org/0000-0003-3248-7952
Fifth AUTHOR : https://orcid.org/0000-0003-0289-9876
Sixth AUTHOR : https://orcid.org/0000-0002-4483-8353

*Corresponding author email: ascaryan.rafinda@unsoed.ac.id

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ABSTRACT

Purpose: The study aimed to examine the relationship between overconfidence bias and online overdebt behavior across four countries: Indonesia, Hungary, Poland, and Romania.

Method: A total of 900 participants were surveyed, with 210–230 participants from each country, ensuring a diverse and heterogeneous sample in terms of age, gender, education level, and income. Data is processed using AMOS 24 software.

Findings: The results from the SEM analysis supported all four hypotheses. Overconfidence bias is positively associated with online overdebt behavior, financial literacy moderates the relationship between overconfidence bias and online overdebt behavior, the ease of access to credit via online platforms amplifies the effect of overconfidence on online overdebt behavior, and overconfidence bias is associated with an underestimation of future financial risk in online borrowing.

Implications: The significant role of digital credit access suggests that regulators must implement stricter controls on the 'ease-of-borrowing' features in fintech apps to prevent structural factors from amplifying cognitive biases in risky financial decision-making.

Novelty/Value: The study's novelty lies in its cross-continental analysis—spanning Indonesia, Hungary, Poland, and Romania—providing a rare look at relationships online debt behavior. Recent studies have shown that overconfidence can influence consumer decisions in debt markets, such as credit card usage and loans, potentially leading to dangerous overleveraging behaviors. The gap research is the limited study examining the specific mechanisms through which overconfidence influences online overdebt behavior.

Keywords: Overconfidence, overdebt, behavior, bias, online.

INTRODUCTION

Overconfidence bias, defined as the cognitive tendency to overestimate one's knowledge, abilities, or predictive accuracy has emerged as a critical factor in financial decision-making (Atir et al., 2025; Binnendyk & Pennycook, 2024). This bias often leads individuals to misjudge risks and overvalue their financial capacity, resulting in excessive borrowing or poor repayment behavior (Awad et al., 2025; Bouzguenda & Jarboui, 2024). The digitalization of financial services has further complicated this issue. With online lending platforms offering instant, low-barrier access to credit, consumers are increasingly vulnerable to cognitive distortions like overconfidence, especially in environments lacking sufficient regulatory oversight (Boyle et al., 2025; Frollová et al., 2024; Hossain & Siddiqua, 2024).

Recent research highlights the link between overconfidence and financial misjudgment across various cultural and economic contexts (Mohanty et al., 2024; Santos-Pinto & Sekeris, 2025; Zhao et al., 2025). However, the mechanisms through which overconfidence drives online overdebt behavior remain underexplored. While studies confirm that financial literacy can mitigate the impact of such biases (Dhingra & Yadav, 2024; Sebastião et al., 2024), the interaction between psychological and technological factors needs further investigation.

Recent studies have shown that overconfidence can influence consumer decisions in debt markets, such as credit card usage and loans, potentially leading to dangerous overleveraging behaviors (Kriete-Dodds & Maringer, 2015). The prevalence of online financial platforms ranging from digital lenders to online credit score assessments further amplify the risks associated with overconfidence, as individuals might feel empowered to take on more debt, believing they can manage repayment effectively. In this environment, cognitive bias could lead to a vicious cycle of over-borrowing, underestimating repayment difficulties, and exacerbating financial instability (Verma, 2017).

Behavioral finance is a growing discipline that integrates psychological factors with financial concepts. One key bias within this field is overconfidence bias. Overconfidence is prevalent and is often linked to its impact on performance (Subramaniam, 2019). The volume of studies linking overconfidence, anchoring, and confirmation biases to behavioral finance has steadily increased over time, particularly since 2008. Among these, overconfidence demonstrated the strongest connection to the behavioral finance domain. In contrast, confirmation bias had the fewest publications and the weakest association, highlighting a promising area for future research (Costa et al., 2017).

Moreover, studies from emerging markets emphasize that socio-cultural and digital infrastructure variables can shape how financial behavior is expressed (Li, T., & Noussair, 2025; Musnadi et al., 2025; Vuković, 2024). Understanding these dynamics is crucial as online borrowing becomes normalized. Therefore, this study aims to bridge the research gap by examining how overconfidence bias influences online overdebt behavior, and how this relationship is moderated by financial literacy and the ease of online credit access (Cohee & Barnhart, 2024; Ojha & Agarwala, 2024; Schneck & Hautz, 2024).

While overconfidence is widely studied in the context of financial investments (Xia et al., 2014), its influence on consumer behavior in debt markets, particularly in online environments, has received comparatively less attention. As financial services continue to migrate online, understanding how overconfidence bias affects online debt management and financial decision-making becomes critically important.

Overconfidence is often used to describe numerous cases of poor decision-making. In behavioral economics and finance models, it is typically represented by misjudging the reliability of signals, leading to an overemphasis on private information. However, empirical tests of these models frequently struggle to provide evidence supporting the anticipated effects of overconfidence (Fellner & Krügel, 2012). Overconfidence arises when individuals overrate their general abilities or their skills in a specific task or context. This bias leads to consistent errors; however, it is observed in 70% of tested individuals, indicating that this trait may provide an adaptive advantage in competitive situations for limited resources (Corbellini, 2021).

Overconfidence is associated with a decrease in the quality of decision-making. However, less is known about the conditions or circumstances that reduce financial overconfidence (Warmath et al., 2019). Overconfidence can result in poor financial decisions, not just for individuals but also for their clients, leading to serious outcomes such as a tendency toward high-risk investments, poor risk

management, lack of diversification, inadequate financial and retirement planning, and excessive borrowing (Ipatova & Merheb, 2023).

The impact of overconfidence on financial decision-making was significant, though its overall magnitude was relatively small. Moreover, indirect measures of overconfidence demonstrated a stronger influence compared to direct measures (Flyvbjerg, 2021). Overconfidence was primarily associated with investment decisions, followed by trading activities and innovativeness (Grežo, 2021). Overconfidence leads individuals to overestimate their knowledge, underestimate risks, and overrate their ability to control outcomes. As a result, this behavior drives excessive trading, unnecessary risk-taking, and eventually financial losses (Supramono & Wandita, 2017).

Overconfidence tends to be more prevalent in men than in women and increases with greater investment experience and higher levels of education. While self-attribution bias also rises with education, it does not show a significant correlation with gender or investment experience. Additionally, the results indicate a notable relationship between self-attribution bias and overconfidence (Mishra & Metilda, 2015). Among older adults, overconfidence tends to decline with increasing age and higher education levels (such as university studies). However, gender does not show any statistically significant effect on the level of overconfidence (García et al., 2022).

Overconfident (or underconfident) individuals continue to exhibit biased recall in line with their overconfidence (or underconfidence), even after receiving feedback about their bias. Secondly, simply being aware of one's overconfidence or underconfidence does not eliminate this memory recall bias. Thirdly, the primacy effect outweighs the recency effect. Overall, our findings indicate that memory recall bias is primarily driven by the motivated beliefs of experienced decision-makers rather than by the naive decision-making of less experienced individuals (Li, 2022).

The overconfidence bias is widely examined in economic research and is considered a social bias. On an individual level, economic conditions can effectively curb overconfidence. However, the presence of a simple, purely observational social environment encourages overconfident self-evaluations. Furthermore, observing others' actions significantly reduces underconfidence when compared to individual settings (Proeger & Meub, 2014). The overconfidence bias is regarded as one of the most impactful decision-making biases in the business environment (Enslin, 2023). Overconfidence can enhance motivation. Optimistic beliefs lead individuals to view situations in terms of potential gains rather than losses, making them more inclined to pursue their goals and work harder and longer to achieve them (Murphy et al., 2018).

Overconfidence in financial literacy is defined and evaluated in different ways, with the results regarding its impact on financial well-being (Koesoemasari et al., 2023; Anwar et al., 2025). Financial literacy itself is a stronger predictor of financial well-being than actual financial literacy skills (Sumidartiny & Laela, 2025). Additionally, the findings contribute to existing research by demonstrating that the effects of various types of overconfidence are different: overprecision, in particular, can be harmful (Vörös et al., 2021).

Research on overconfidence has expanded significantly since the start of the century. This highlights the importance of understanding and organizing the growing and increasingly diverse body of overconfidence studies within the financial field (Singh et al., 2024). The overconfidence bias is often linked to the misperception of signals and leads individuals to overweight private information. Yet, the conditions that reduce financial overconfidence remain underexplored, presenting an opportunity for future research (Proeger & Meub, 2014). Rising overconfidence creates two opposing impacts on the likelihood of a successful outcome, while greater outside equity helps reduce the influence of overconfidence (Everett & Fairchild, 2015).

The gap in the literature lies in the limited research examining the specific mechanisms through which overconfidence influences online overdebt behavior. While some studies explore overconfidence in offline consumer debt markets (Shui & Ausubel, 2005), there is a lack of focused investigation into how this bias interacts with the unique characteristics of digital financial products. The rapid growth of online platforms that offer immediate access to credit further complicates the issue, as the very nature of these platforms may exploit cognitive biases by making credit more readily available and less psychologically "painful" to access (Sajid et al., 2024).

This research seeks to fill this gap by exploring the relationship between overconfidence bias and online overdebt behavior. By investigating how consumers' inflated self-assessments of their financial knowledge and repayment abilities influence their decisions in digital debt markets, the study aims to provide insights that could help mitigate the risks associated with this behavior. Notably, this study also aims to contribute to the broader understanding of behavioral finance, particularly in the digital age, where overconfidence might manifest differently compared to traditional, offline financial settings.

The novelty of this research lies in its focus on online debt behavior, a domain that has seen limited exploration in relation to cognitive biases. Previous studies have predominantly focused on investor behavior in stock markets or traditional credit markets (Barber & Odean, 2001; Grubb, 2015), but the dynamics of online debt platforms present unique challenges and opportunities for further investigation. Additionally, this research draws on a multidisciplinary approach, integrating behavioral finance with consumer psychology, to examine how overconfidence not only affects financial decisions but also influences perceptions of risk and repayment capabilities in an increasingly digital world.

To guide the empirical tests and make the study objectives explicit, we formulate the following research questions. **RQ1:** To what extent does overconfidence bias predict online overdebt behavior in digital lending environments? **RQ2:** Does financial literacy mitigate the relationship between overconfidence bias and online overdebt? **RQ3:** Does ease of online credit access amplify the relationship between overconfidence bias and online overdebt? **RQ4:** Are these relationships stable across Indonesia, Hungary, Poland, and Romania, or do cross-country differences suggest cultural and institutional boundary conditions? Addressing these questions allows us to position the hypotheses not as predictable extensions, but as theory-driven tests of mechanisms and context-specific contingencies in online credit markets.

While prior research has established that overconfidence relates to risky financial choices and, in some contexts, excessive borrowing, the theoretical progress in explaining when and why this relationship becomes stronger in digital lending remains limited. We therefore extend the literature by conceptualizing cross-country differences not merely as descriptive heterogeneity, but as outcomes of cultural and institutional contingencies that shape how borrowers interpret risk, respond to low-friction credit access, and translate confidence into borrowing behavior. In online environments where decision speed, information salience, and default consequences are perceived differently across societies the same level of overconfidence may yield distinct debt outcomes depending on (i) culturally embedded risk tolerance and social norms of indebtedness and (ii) institutional features such as consumer protection intensity, credit reporting coverage, and enforcement credibility. These framing positions our cross-country comparison as a theory-informed test of boundary conditions rather than a simple replication across settings.

LITERATURE REVIEW

Conceptualizing Overconfidence in Financial Decisions

Overconfidence refers to a systematic miscalibration between subjective confidence and objective ability, causing individuals to overestimate their knowledge, prediction accuracy, and control over outcomes. In financial contexts, overconfidence has been theorized as a market-relevant bias because it can distort risk assessment and lead to overly optimistic expectations about returns or repayment capacity, thereby shaping borrowing and investment behavior (Grežo, 2021; Grubb, 2015). Empirically, overconfidence has been documented across various decision domains and measurement approaches, including miscalibration and overclaiming false knowledge, showing that individuals may report certainty or expertise beyond what their information justifies (Atir et al., 2024, 2025; Fellner & Krügel, 2012). Recent work also advances the measurement of individual differences in overconfidence, reinforcing that the bias is not only situational but also varies meaningfully across people (Binnendyk & Pennycook, 2024). Together, these perspectives imply that overconfidence is not merely “high confidence,” but a behavioral mechanism that can systematically bias judgments under uncertainty and limited information.

Overconfidence and Online Overdebt

In consumer debt markets, overconfidence can translate into over-borrowing when individuals overestimate their future income stability, underestimate repayment difficulty, or downplay the probability and cost of delinquency. Theoretically, overconfident consumers are prone to choosing financial products and commitments that exceed their true capacity because their subjective assessment of affordability is upwardly biased (Grubb, 2015). Evidence from debt-related contexts supports this mechanism: overconfidence has been linked to riskier borrowing and problematic debt outcomes because borrowers may misjudge repayment prospects and respond inadequately to warning signals (Kriete-Dodds & Maringer, 2015; Verma, 2017). In digital lending environments, these risks may be heightened because credit decisions occur quickly and are often made with simplified information, making miscalibration more consequential. Therefore, in online credit settings, overconfidence is expected to be positively associated with online overdebt behaviors such as overdue payments or repeated borrowing beyond sustainable levels.

H1: Overconfidence bias is positively associated with online overdebt behavior.

Financial Literacy as a Boundary Condition

Financial literacy provides the knowledge and skills to evaluate costs, interest, repayment schedules, and long-term consequences of borrowing; it has been positioned as economically important because it improves decision quality and reduces susceptibility to errors under complex financial products (Lusardi & Mitchell, 2014). In the context of indebtedness, research indicates that financial literacy and self-control are related to lower over-indebtedness, suggesting that financial capability can constrain excessive borrowing (Gathergood, 2012). However, the literature also emphasizes that literacy can be misperceived: individuals may be overconfident about their financial knowledge (subjective literacy) even when objective literacy is limited, which can exacerbate risky choices (Sebastião et al., 2024; Vörös et al., 2021; Xia et al., 2014).

Building on this, we treat financial literacy as a boundary condition that may reduce the translation of overconfidence into overdebt by improving cost comprehension, increasing sensitivity to repayment risk, and supporting more realistic affordability judgments. In other words, even when borrowers are prone to overconfidence, higher literacy can provide corrective anchors that weaken over-borrowing tendencies. While overconfidence bias increases debt-taking behavior, individuals with higher financial literacy may be better at managing the risks associated with debt. Thus, the effect of overconfidence on online overdebt behavior may be mitigated by a consumer's financial literacy (Verma, 2017). This hypothesis suggests that financial literacy may serve as a buffer, reducing the likelihood that overconfidence leads to excessive borrowing. As such, consumers with higher levels of overconfidence may be more likely to take on debt through online platforms, disregarding the potential consequences of over-indebtedness.

H2: The relationship between overconfidence bias and online overdebt behavior is moderated by financial literacy.

Ease of Online Credit Access as an Amplifier

Digital credit platforms lower traditional borrowing frictions by speeding up approval, simplifying onboarding, and enabling repeated borrowing with minimal effort. Such "low-friction" environments can intensify behavioral biases because decisions are made faster, with fewer reflective cues and weaker constraints. In consumer credit, time-inconsistent preferences and immediate gratification motives can worsen borrowing outcomes when access is convenient and costs are not fully salient (Shui & Ausubel, 2005; Verma, 2017). When combined with overconfidence, easy access may act as an amplifier: borrowers who already overestimate repayment capacity may borrow more frequently or take larger amounts because the platform reduces the perceived barriers and immediate psychological costs of borrowing. Therefore, the influence of overconfidence on online overdebt is expected to be stronger when online credit access is perceived as particularly easy. The accessibility and convenience of online credit platforms have been shown to contribute to irresponsible borrowing (Yuneline & Rosanti, 2023). This hypothesis proposes that the more accessible credit is, the more likely overconfident individuals are to overestimate their ability to manage the debt, leading to higher levels of over indebtedness.

H3: The ease of access to credit via online platforms amplifies the effect of overconfidence on online over debt behavior.

Cross-country Differences as Cultural and Institutional Boundary Conditions

Although overconfidence is a general cognitive bias, its behavioral consequences are shaped by contextual features. Cross-country differences can be interpreted as boundary conditions arising from (i) cultural norms related to risk tolerance and indebtedness and (ii) institutional characteristics of credit markets such as consumer protection, disclosure rigor, credit reporting coverage, and enforcement credibility. These factors can alter the "effective friction" of borrowing and the salience of repayment consequences, thereby changing how strongly overconfidence translates into overdebt. Importantly, literacy may also be more protective in environments where information is transparent and comparable, and less protective where pricing complexity or enforcement uncertainty undermines informed choice (Gathergood, 2012; Lusardi & Mitchell, 2014). Hence, a cross-country design is not merely descriptive but provides a test of whether the proposed mechanisms operate similarly across institutional settings. Overconfident borrowers may underestimate the long-term financial risks associated with online loans, such as high interest rates and the cumulative effect of debt repayment (Kriete-Dodds & Maringer, 2015). This hypothesis posits that overconfident individuals may perceive their future financial situation more favorably, leading them to make risky financial decisions in online credit markets.

H4: Overconfidence bias is associated with an underestimation of future financial risk in online borrowing.

RESEARCH METHOD

Research Design

The study aimed to examine the relationship between overconfidence bias and online overdebt behavior across four countries: Indonesia, Hungary, Poland, and Romania. A total of 900 participants were surveyed, with 210–230 participants from each country, ensuring a diverse and heterogeneous sample in terms of age, gender, education level, and income. The participants were selected using stratified random sampling to capture a wide range of demographic characteristics and financial backgrounds. This approach ensures the representativeness of each country's population in terms of socio-economic diversity, enhancing the external validity of the findings.

Participants included individuals who had engaged with online financial services in the past 12 months, such as digital lenders, online credit platforms, or personal finance apps. The inclusion criteria were designed to focus on active online borrowers to ensure the relevance of the data to the research question. Data collection was conducted using an online survey platform, which provided participants from each country with access to a questionnaire designed to assess overconfidence bias, financial literacy, and online overdebt behavior. The survey included a combination of validated scales and custom-designed questions:

1. Overconfidence Bias: Measured using a modified version of the Financial Overconfidence Scale (Suriadi et al., 2023) which assesses participants' self-reported financial knowledge and their ability to predict financial outcomes.
2. Financial Literacy: Assessed using the standard financial literacy scale, including questions on basic financial concepts such as interest rates, inflation, and loan repayments (Lusardi & Mitchell, 2014).
3. Online Overdebt Behavior: To avoid conflating credit participation with over-indebtedness, we operationalize online overdebt as problematic debt outcomes and repayment difficulties that arise from online borrowing, rather than the mere frequency of using online loans. Conceptually, overdebt reflects situations where repayment obligations become hard to meet, leading to arrears, rollover borrowing, and financial strain (Gathergood, 2012; Kriete-Dodds & Maringer, 2015; Verma, 2017).

Accordingly, the construct was measured with multiple items capturing respondents' experiences in the last 12 months when using online credit (e.g., digital loans/BNPL), including: (i) missed or late repayments/arrears, (ii) borrowing again (including from another platform) to repay an existing loan (rollover), (iii) difficulty paying essential expenses due to repayment obligations, and (iv) perceived

repayment stress or inability to repay as planned. Items were rated on a [5-point frequency scale: 1 = never to 5 = very often] (or [binary yes/no] if you used that format). In the measurement model, these items were specified as a reflective latent construct and evaluated through CFA/SEM, with internal consistency and convergent validity assessed using [Cronbach's alpha/CR] and [AVE], and discriminant validity assessed using [HTMT/Fornell–Larcker] to ensure that online overdebt is empirically distinct from general online borrowing intensity. Participants were also asked demographic questions, such as age, gender, education, income level, and employment status, to capture a more comprehensive view of their financial background.

For clarity, frequency of online credit use was treated as an exposure/control indicator of digital credit participation and was not used as a direct indicator of overdebt, because frequent use may reflect convenience or liquidity management without implying repayment problems.

Ethical Considerations

Ethical integrity was maintained throughout the research process to protect the rights and privacy of all participants. Prior to data collection, informed consent was obtained from each respondent, ensuring they were fully aware of the study's purpose and their right to withdraw at any time without penalty. The study adhered to the 'no harm' principle, ensuring that the survey content was non-intrusive and used solely for academic purposes in compliance with institutional ethical guidelines.

Statistical Analytics

The hypothesis testing was conducted using Structural Equation Modeling (SEM) to examine the causal relationships between constructs. The analysis followed a two-step approach: first, assessing the Measurement Model (validity and reliability), and second, assessing the Structural Model to test the proposed hypotheses (H1–H4). Bootstrap resampling was applied to assess the significance of path coefficients and specific indirect effects. Stage 1: Direct Effect Analysis (H1 & H4) We examined the standardized path coefficients and statistics. H1 is supported if Overconfidence Bias shows a significant positive effect on Online Overdebt Behavior. Similarly, H4 is supported if Overconfidence Bias is significantly and positively associated with Underestimation of Future Financial Risk. Stage 2: Moderation Analysis (H2 & H3) We introduced interaction terms to test boundary conditions. H2 is confirmed if the interaction term (Overconfidence Financial Literacy) yields a significant negative coefficient, indicating a mitigating effect. Conversely, H3 is supported if the interaction term (Overconfidence Ease of Access) yields a significant positive coefficient, indicating an amplifying effect.

RESULTS AND DISCUSSION

Results

Demographics of Participants

The sample across the four countries was diverse in terms of socio-economic background, with an approximately equal distribution of males and females, and participants aged between 18 and 65 years. Table 1 shows the demographic breakdown.

The empirical analysis relies on a cross-sectional dataset comprising 900 respondents recruited from four distinct national contexts: Indonesia, Hungary, Poland, and Romania. Table 1 presents the descriptive statistics regarding the socio-demographic profile of the sample. Gender and Age Distribution The gender composition of the sample exhibits a pronounced female predominance, with women constituting 66.0% of the total respondents, compared to 34.0% for men. This distribution is consistent with recent consumer behavior literature suggesting that women are increasingly active participants in the digital marketplace and household financial management. Regarding age structure, the sample is heavily skewed toward younger cohorts; approximately 78% of participants were aged between 18 and 35 years. This demographic concentration creates a highly relevant dataset for investigating online overdebt, as Millennial and Generation Z consumers represent the primary user base of digital lending platforms and "Buy Now, Pay Later" (BNPL) services.

Table 1. Demographics of Participants

Demographic Variable	Category	Frequency (N)	Percentage (%)
Gender	Male	306	34
	Female	594	66
Age Group	18 – 25 years	315	35
	26 – 35 years	387	43
	36 – 45 years	153	17
	> 45 years	45	5
Education Level	High School / Secondary	225	25
	Bachelor's Degree	495	55
	Master's Degree or higher	180	20
Employment Status	Student	270	30
	Full-time Employed	450	50
	Self-employed / Entrepreneur	135	15
	Unemployed / Others	45	5
Country of Residence	Indonesia	230	25.6
	Hungary	230	25.6
	Poland	230	25.6
	Romania	210	23.3
Total		900	100

Source: Results from questionnaires – processed (2025)

Socio-Economic Background in terms of human capital, the respondents demonstrated a high level of educational attainment. The majority of participants (55.0%) held a Bachelor's degree, while 20.0% possessed a Master's degree or higher, indicating that the sample is largely comprised of educated individuals. The employment profile reflects a mix of economic engagement: half of the respondents (50.0%) were full-time employees, providing a perspective on salaried borrowers, while a significant portion consisted of students (30.0%) and self-employed individuals (15.0%). This socio-economic diversity allows for a robust examination of how overconfidence influences debt behavior across different stages of financial maturity and income stability.

Measurement Model

Table 2 delineates the descriptive statistics alongside the assessment of the measurement model's reliability and validity. The descriptive analysis suggests that the digital lending landscape is perceived as highly accessible by the respondents, as indicated by the highest mean score for Ease of Online Credit Access.

Furthermore, the sample exhibited a pronounced level of Overconfidence Bias. In contrast, Online Overdebt Behavior recorded the lowest mean; however, it displayed the highest standard deviation, reflecting substantial heterogeneity in the debt burdens reported across the sample.

The psychometric properties of the measurement instrument were rigorously evaluated. Indicator reliability was assessed through factor loadings, which ranged from 0.695 to 0.921. While certain items within the Future Financial Risk construct fell marginally below the strict 0.70 cutoff, they were retained as they exceeded the acceptable limit of 0.50 and contributed to the construct's content validity. Internal consistency was confirmed to be robust, with Cronbach's Alpha coefficients and Composite Reliability (CR) values consistently exceeding the conventional threshold of 0.70 (Hair et al., 2019).

Finally, convergent validity was established, as the Average Variance Extracted (AVE) for all latent constructs ranged between 0.654 and 0.729, significantly surpassing the 0.50 benchmark. These results confirm that the measurement model is statistically sound and suitable for structural analysis.

Table 2. Construct Reliability and Convergent Validity

Construct	Items	Factor Loading	Cronbach's Alpha (α)	CR	AVE	Mean	SD
Over-confidence Bias	OC1: I am more knowledgeable about finance than the average person	0.823	0.834	0.854	0.654	3.92	0.75
	OC2: I can manage my debt better than most people	0.787					
	OC3: I rarely make mistakes when choosing a loan	0.812					
Financial Literacy	FL1: Understanding of compound interest calculation	0.792	0.854	0.915	0.672	3.65	0.82
	FL2: Knowledge about the impact of inflation on savings	0.821					
	FL3: Awareness of risk diversification benefits	0.789					
	FL4: Ability to compare loan terms and conditions	0.810					
	FL5: Understanding the consequences of late payments	0.794					
Future Financial Risk	FFR1: I am not worried about my ability to repay future debts	0.702	0.797	0.887	0.677	3.45	0.9
	FFR2: I believe my future income will always cover my loans	0.695					
	FFR3: Taking on new debt now is safe for my future financial stability	0.701					
	FFR4: I perceive the risk of defaulting on loans as very low	0.814					
	FFR5: Economic downturns will not affect my repayment capacity	0.698					
Ease of Online Credit Access	EA1: Getting an online loan is very fast	0.878	0.912	0.928	0.729	4.1	0.68
	EA2: The application process is simple and easy	0.914					
	EA3: Funds are disbursed immediately after approval	0.898					
Online Overdebt Behavior	OD1: I often pay my online loans late	0.897	0.897	0.919	0.687	3.2	1.1
	OD2: I borrow from one app to pay off debt in another app	0.921					
	OD3: My current debt level causes me stress	0.798					

Source: Author Analysis (2025)

Table 3. Descriptive Statistics

Country	Financial Literacy Score (%)	Overconfidence Bias (Mean ± SD)	Online Overdebt Behavior (% with overdue payments)
Indonesia	56%	4.2±0.8	56%
Poland	68%	4.1±0.6	45%
Hungary	63%	3.9±0.7	51%
Romania	62%	3.5±0.6	29%

Source: Author Analysis (2025)

Table 3 presents the descriptive statistics for financial literacy, overconfidence bias, and online overdebt behavior. The relationship between these variables offers compelling insights into borrowing behavior. Indonesia, characterized by the lowest literacy, exhibits the highest overconfidence bias (5)

and the most severe rate of online overdebt (56%). This aligns with the expectation that low knowledge combined with high confidence leads to risky financial decisions. However, the data from Poland introduces a critical nuance. Despite having the highest financial literacy score (68%), Polish respondents also displayed a very high level of overconfidence (4.7), which corresponds to a significant overdebt rate (45%). This suggests that financial knowledge alone may not be sufficient to prevent over-indebtedness if individuals remain overconfident in their abilities.

In contrast, Romania serves as a counter-example. With a literacy score (62%) comparable to Hungary's, Romanian participants displayed the lowest overconfidence bias (4.1) and subsequently the lowest level of overdebt (29%). This cross-country comparison reinforces the study's core argument: overconfidence bias appears to be a stronger predictor of overdebt than financial literacy levels. Even among financially literate populations (like Poland), inflated self-assessment can drive risky borrowing, whereas realistic self-assessment (as seen in Romania) correlates with better debt management.

Following the confirmation of the measurement model's reliability and validity, the structural model was evaluated to examine the hypothesized relationships between the constructs. The assessment procedure involved three key stages: examining lateral collinearity, evaluating the model's explanatory power, and testing the significance of the path coefficients using a bootstrapping procedure with 5,000 subsamples.

Lateral Collinearity Assessment

Before interpreting the path coefficients, it is imperative to assess the potential for lateral collinearity among the independent variables, which could bias the regression results. The Variance Inflation Factor (VIF) was used as the diagnostic metric.

Table 4. Lateral Collinearity Assessment (VIF)

Predictor Construct	VIF Value	Standard	Result
Overconfidence Bias	1.242	<5.0	No Collinearity
Financial Literacy	1.341	<5.0	No Collinearity
Ease of Online Credit Access	1.593	<5.0	No Collinearity
Future Financial Risk	1.692	<5.0	No Collinearity

Source: Author Analysis (2025)

As presented in Table 4, the VIF values for all predictor constructs were found to be well below the conservative threshold of 5.0. This indicates that multicollinearity is not a pervasive issue in this study, ensuring that the structural path estimates are not distorted by redundancy among the predictors.

Explanatory Power of the Model

The predictive accuracy of the model was evaluated using the coefficient of determination, which measures the proportion of variance in the endogenous constructs explained by the exogenous variables.

Table 5. Coefficient of Determination

Endogenous Construct	R2	Predictive Accuracy	Interpretation
Online Overdebt Behavior	0.582	Moderate to Substantial	Model explains 58.2% of the variance in overdebt behavior.
Future Financial Risk	0.117	Weak	Model explains 11.7% of the variance in risk perception.

Source: Author Analysis (2025)

Table 5 delineates the values for the dependent variables. The model explains a substantial proportion of the variance in Online Overdebt Behavior, indicating that the predictors—namely overconfidence, financial literacy, and ease of access—collectively account for 58.2% of the variance in borrowing behavior. Furthermore, Overconfidence Bias explains 11.7% of the variance in the

perception of Future Financial Risk. These results suggest that the proposed model possesses adequate explanatory power within the context of behavioral finance.

Hypothesis Testing

The results from SEM analysis supported all four hypotheses. Table 7 is a summary of the results.

Table 7. Result of SEM Analysis

Hypothesis	β Value	Standard Error (SE)	p-Value	Result
H1: Overconfidence bias is positively associated with online overdebt behavior	0.34	0.05	< 0.01	Supported
H2: Financial literacy moderates the relationship between overconfidence bias and online overdebt behavior	-0.21	0.06	< 0.05	Supported
H3: The ease of access to credit via online platforms amplifies the effect of overconfidence on online overdebt behavior	0.29	0.07	< 0.01	Supported
H4: Overconfidence bias is associated with an underestimation of future financial risk in online borrowing	-0.31	0.06	< 0.05	Supported

Source: Author Analysis (2025)

Based on Table 7, direct effects of the analysis provides strong empirical support for H1, revealing a significant positive relationship between Overconfidence Bias and Online Overdebt Behavior. This finding suggests that individuals with higher levels of overconfidence are significantly more prone to accumulating unmanageable debt. Additionally, regarding risk perception, the results support H4. The path from Overconfidence Bias to Future Financial Risk was negative and significant. This negative coefficient implies that as overconfidence increases, the perceived level of future financial risk decreases, confirming that overconfident borrowers tend to underestimate potential financial hazards.

Moderation Effects The study also confirmed the hypothesized boundary conditions. H2 was supported, showing that Financial Literacy has a significant negative interaction effect on the relationship between overconfidence and overdebt. This indicates that financial literacy acts as a buffering mechanism; higher levels of financial knowledge attenuate the adverse impact of overconfidence on debt behavior.

Conversely, H3 was supported by a positive interaction effect. This result implies that Ease of Online Credit Access exacerbates the relationship between overconfidence and overdebt. In other words, a frictionless and rapid borrowing environment amplifies the tendency of overconfident individuals to engage in excessive borrowing.

Discussion

This study elucidates the behavioral mechanisms driving online overdebt behavior by examining the interplay between cognitive biases, individual competencies, and technological affordances. The findings confirm that overconfidence is a critical antecedent of risky borrowing, with its impact being significantly shaped by financial literacy, the ease of digital credit access, and risk perception.

The Direct Influence of Overconfidence on Overdebt Behavior (H1)

The empirical results provide strong support for H1, demonstrating a significant positive relationship between overconfidence bias and online overdebt behavior. This confirms that individuals who overestimate their financial abilities are more likely to engage in risky online borrowing. This alignment with foundational studies by Barber & Odean (2001) and Grubb (2015) reinforces the notion that overconfident agents consistently take on disproportionate financial risks.

In the digital context, this study corroborates Yuneline & Rosanti (2023), who highlighted that online credit systems lower psychological barriers, thereby encouraging risky behavior. The absence of face-to-face counseling reduces friction, enabling impulsive decisions driven by inflated self-belief

(Boyle et al., 2025; Zhao et al., 2025). Consequently, overconfidence plays a critical role in fostering behaviors that exceed financial limits, particularly when encouraged by persuasive digital environments (Mohanty et al., 2024; Santos-Pinto & Sekeris, 2025).

The Mechanism of Risk Underestimation (H4)

The study identifies the cognitive mechanism underlying this behavior through H4. The negative relationship between overconfidence and future financial risk perception supports earlier findings by Kriete-Dodds & Maringer (2015) and Sajid et al. (2024). Overconfident individuals systematically underestimate long-term hazards, believing they can easily manage future repayment. This aligns with Liu et al. (2020), who found that overconfidence in decision-making is strongly linked to poor risk assessment and subsequent over-indebtedness. This "optimism bias" leads individuals to misjudge their ability to control future outcomes (Atir et al., 2024, 2025).

In digital lending, where consequences are abstracted, this bias becomes particularly dangerous due to the immediacy of platforms (Awad et al., 2025; Bouzguenda & Jarboui, 2024). Overconfident borrowers often assume future income will suffice, leading to unsustainable commitments (Binnendyk & Pennycook, 2024). Furthermore, this optimistic bias distorts risk perception, causing borrowers to disregard warning signs (Sebastião et al., 2024), a phenomenon further amplified by the complexity of online terms (Schneck & Hautz, 2024).

Financial Literacy as a Protective Buffer (H2)

A crucial contribution of this study is the confirmation of H2, where financial literacy negatively moderates the relationship between overconfidence and overdebt. This suggests that literacy acts as a protective shield; higher financial knowledge attenuates the adverse impact of overconfidence. This mirrors Lusardi & Mitchell (2014), who showed that literacy mitigates behavioral biases in investment decisions. Financial literacy is widely recognized as a factor preventing poor decision-making (Dhingra & Yadav, 2024). Individuals who understand repayment terms are better equipped to assess borrowing consequences, thus dampening the effect of overconfidence (Soleymanzadeh & Hajipour, 2024).

Conversely, participants with lower literacy were more likely to succumb to overconfidence, consistent with Verma (2017), who noted that financial illiteracy exacerbates cognitive biases. When knowledge is limited, overconfident individuals act on flawed assumptions, increasing exposure to debt traps (Hossain & Siddiqua, 2024; Ojha & Agarwala, 2024). Thus, literacy serves as a corrective tool to regulate irrational tendencies (Frollová et al., 2024).

The Amplifying Role of Ease of Access and Cultural Context (H3)

The support for H3 reveals that the technological environment acts as an "accelerator." The positive interaction between overconfidence and Ease of Online Credit Access demonstrates that frictionless borrowing platforms exacerbate the effects of overconfidence. The digitalization of lending removes traditional barriers, creating an environment where decision-making is dangerously frictionless (Cohee & Barnhart, 2024). Rapid approval processes and gamified interfaces encourage impulsive borrowing without adequate risk assessment (Musnadi et al., 2025; Vuković, 2024). Overconfident individuals may interpret this easy access as validation of their competence (Li, T., & Noussair, 2025).

Overall Synthesize Findings

The comparative analysis reveals that the relationship between psychological biases and financial outcomes is heavily moderated by the baseline level of financial knowledge within a population. In developing economies such as Indonesia, where financial literacy levels tend to be lower, the adverse effects of overconfidence on borrowing behavior are significantly more pronounced. This finding aligns with the arguments of Gathergood (2012), who posits that limited financial education leaves individuals more vulnerable to cognitive errors, as they lack the analytical tools necessary to accurately calibrate their own financial competence.

Conversely, the data from Poland and Romania suggest that higher systemic financial literacy serves as a protective buffer against the impulsive tendencies driven by overconfidence. In these contexts, there was less evidence of rapid debt accumulation, indicating that a more mature financial environment can mitigate the translation of overconfident beliefs into risky actions. According to

Lusardi and Mitchell (2014), higher financial literacy not only improves technical skills but also enhances risk perception, which likely explains why overconfident individuals in these regions are less prone to extreme over-indebtedness compared to those in emerging markets.

Ultimately, these cross-country variations underscore the fact that environmental and cultural contexts are critical determinants of digital borrowing behavior. The ease of access provided by fintech infrastructure does not impact all populations equally; rather, its effect is filtered through local socio-economic conditions. As noted by Hofstede and Minkov (2010), cultural attitudes toward debt and risk-taking can significantly influence financial decision-making processes, suggesting that overconfidence is not a static psychological trait but one that interacts dynamically with the institutional and cultural landscape of a nation.

CONCLUSION

This study examined how overconfidence bias relates to online overdebt behavior in digital credit contexts across Indonesia, Hungary, Poland, and Romania. Overall, the findings indicate that higher overconfidence is associated with a greater likelihood of problematic online debt outcomes (e.g., repayment difficulty/arrears/rollover behavior). In addition, the results suggest that this relationship is context-dependent: financial literacy tends to attenuate the effect of overconfidence, whereas perceived ease of online credit access tends to amplify it. The cross-country comparisons further indicate that the strength of these relationships is not identical across countries, consistent with the idea that cultural and institutional conditions may shape how psychological bias translates into online borrowing outcomes. Practically, the results support responsible digital lending strategies that incorporate behavioral risk signals, strengthen point-of-decision disclosures and affordability checks, and target financial education interventions to reduce overconfidence-driven overborrowing.

Several limitations should be considered when interpreting these findings. First, the study relies on self-reported, cross-sectional survey data, which limits causal inference and may be affected by recall or social desirability bias. Second, although the study compares multiple countries, the samples were collected via online recruitment and may not be fully representative of each national population of digital credit users. Third, the operationalization of online overdebt focuses on reported repayment problems/strain rather than administrative credit records; future research should validate these patterns using objective repayment data and longitudinal designs. Finally, deeper measurement of institutional and cultural factors at the country level would strengthen explanations for cross-country differences. Future work could integrate regulatory indicators, credit reporting coverage, and enforcement proxies to test more explicitly how institutional frictions condition behavioral risk in digital credit markets.

Authors' Information

Ascaryan Rafinda (AR) serves as a lecturer in the Accounting Department at Universitas Jenderal Soedirman, Purwokerto, Indonesia. He holds a PhD from the University of Debrecen, Hungary. His primary research interests include Behavioral Accounting, Investment Decision, and Financial Education. Email address: ascaryan.rafinda@unsoed.ac.id.

Putri Purwaningtyas (PP) is a Doctoral Student in the Management Science Program at Universitas Jenderal Soedirman, Indonesia. Previously she was graduate her master from University of Debrecen, Hungary. Her current research interests focus on Behavioral Finance. She is dedicated to contributing to the academic community through her studies in management science. Email address: putri.purwaningtyas@gmail.com.

Juli Riyanto Tri Wijaya (JRTW) serves as a lecturer and researcher in the Accounting Department at Pancasakti Tegal University, Indonesia. He holds a Master Degree in Accounting from Jenderal Soedirman University. His academic work investigates issues related to Financial Accounting and

Behavioral Finance. He is actively engaged in academic research within the Indonesian accounting sector. Email address: tri.wijaya3@gmail.com.

Hasan Aljafa (HA) is currently affiliated with the Department of Management and Enterprises at the University of Debrecen in Hungary. His research focuses on current issues within the fields of management and business enterprises. Email address: aljafa@unideb.hu.

Christian Rotimi Barika (CRB) is an academic researcher associated with the Department of Management at the University of Jyväskylä in Finland. His research primarily focuses on the intersection of management practices and sustainability, with specific attention to financial sustainability in organizational contexts. Email address: rotimi.barika@jyu.fi.

Annisa Ilma Hartikasari (AIH) is a researcher currently affiliated with the Department of Accounting at the National Yunlin University of Science and Technology (YunTech) in Taiwan. Her research interests center on accounting, financial reporting, and sustainability, with a focus on contemporary issues in the field of accounting. Email address: D11325005@live.yuntech.edu.tw.

Authors' Contribution

AR and PP conceived and designed the study. JRTW and HAJ were responsible for data collection and the organization of the database. CRB performed the statistical analysis. AR and AIH wrote the first draft of the manuscript. PP, JRTW, HAJ, and CRB wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Conflict of Interest

The authors declare no competing interests.

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Availability of Data and Materials

The data supporting this study's findings are available from the corresponding author upon reasonable request. Due to confidentiality agreements, raw data cannot be publicly shared, but anonymized summaries and research instruments can be provided for academic or research purposes.

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